

# The Ragchewer

March 2008

The monthly newsletter of the  
Lancaster & Fairfield  
County Amateur Radio Club

On the Web: [www.k8qik.org](http://www.k8qik.org)

Send email to [K8QIK@columbus.rr.com](mailto:K8QIK@columbus.rr.com)

## **Club Meetings:**

1<sup>st</sup> Thursday of every month  
at 7:30 pm at the clubhouse.

## **VE Testing:**

The third Sunday of every  
even numbered month.  
Register at 9:30 am and  
testing at 10:00 am

## **Club House**

### **Location:**

On State Route 37  
(Granville Pike) next to  
Beavers Field.

## **Nets:**

**Mondays** at 9:00 p.m.  
147.03 MHz (+.6)  
146.70 MHz (-.6) Alt. Freq.  
443.875 MHz (+5)  
**Thursday** at 8:00 p.m.  
443.875 MHz (+5)  
UHF linked system

Packet BBS 145.53MHz  
K8QIK-1 BBS  
K8QIK-2: Ohio53

## **Weather Spotter**

### **Net:**

146.76 Repeater with 123Hz  
tone Tuesday at 7:30 pm  
Alt frequency 147.24 MHz

## **March Birthdays**

John Hull	W8RRJ
Earl Ogg	AA8AT
Allen Sellers	KB8JLG
A1C Edward Campbell	KC8DPH
Jeffery VanMeter	KA8HQL
Gary Snider	W8GTS

## **Thursday Radio Night**

Radio night is every Thursday at 6:00 p.m.  
(except the first Thursday which is the club  
monthly meeting). Work a little HF or maybe  
build something? How about a hot cup of  
coffee. We'll have them all waiting for you.

## **ARRL Membership**

When you join the ARRL, or renew your  
membership through the club, we retain \$15 for  
each new membership OR lapsed membership  
(of two years or more), and we retain \$2 for each  
renewal. Please support our club, it doesn't cost  
any more. Send or give all paperwork to  
Treasurer with your money.

## **April VE Test:**

The next VE test will be Sunday April 20th at  
the clubhouse on Route 37. Register at 9:30 a.m.  
and testing begins at 10:00 a.m. Prepare  
yourself, take this test and upgrade!

## **Free Swap and Sell**

If you have anything ham radio related, you can  
swap it or sell it here. List your items for free.  
Give a price and how to contact you. Send the  
list to [K8QIK@columbus.rr.com](mailto:K8QIK@columbus.rr.com)

## **2007-2008 Officers**

### **President:**

Charlie Snoke, N8KZN

### **Vice President:**

Mark Urbine, KC8TUW

### **Treasurer:**

Ed Campbell Sr., WD8PGO

### **Secretary:**

Mary Travis, KD8EEI

### **Trustee:**

John Hilliard, W8OF

### **Station Engineer:**

John Hilliard, W8OF

### **Net Manager:**

John Fick, KD8EEK

### **Activities Manager:**

John Fick, KD8EEK

### **Public Relations:**

Mark Urbine, KC8TUW

### **Flower Fund:**

Ed Bennett, KD8EEJ

### **Web Master:**

Robert Northrup, KC8PSW

### **Chief Cook and Bottle**

### **Washer:**

Charlie Snoke, N8KZN

### **Editor:**

Jack Travis, AE8P  
(740) 687-1985

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## March 6, 2008 Meeting Minutes

At 7:30 p.m. President Charlie Snoke, N8KZN who lead the Pledge of Allegiance, called the meeting to order.

There were 24 members present. There were four new applications to review for first reading (Ben Doran, KD8FYS; Ket Doran, KD8GNX; Jay Cantieri, KD8HVW; George Skeele, KD8GXV).

### Officer Reports

#### **Secretary Report: Mary Travis, KD8EEI**

Minutes are posted in the Ragchewer. Motion to accept by John, W8AGS and seconded by Allen, KB8JLG. Motion carried.

#### **Treasurer's Report: Ed Campbell, Sr., WD8PGO**

In Ed's absence, Charlie gave the club financials. Motion to accept by John, W8OF and seconded by Bob, KD8EXK. Motion carried.

#### **VP Report: Mark Urbine, KC8TUW**

Mark, KC8TUW said he would let us know when the students from Lancaster High School were going to have the 60 minute documentation of local clubs they have interviewed showing on Channel 6.

#### **Trustee Report: John Hilliard, W8OF**

John reported that we have a new sign on the back door with our club name and address and it is reflective so it will show up at night. This sign was done at no cost to the club.

### Committee Reports

#### **Webmaster – Robert Northrup, KC8PSW**

Robert reported that he had contacted several web hosting companies and the best price was with Go Daddy who we currently use for our web domain. If we go with the deluxe package, 150 Gb, 1,500 Gb for transfer data, 1,000 email accounts, unlimited e-mail forward and for the 21 months remaining of our web hosting, the cost would be \$91. After that the cost would be approx. \$6.25/mo plus approx. \$3.00/mo for the web domain.

There was a lot of discussion and Jeff, WD8JLI made a motion giving Bob, KC8PSW permission to go forward with Go Daddy as our new web hosting company for 21 months at a fee up to \$100 which will

synchronize with our domain registration with Go Daddy, seconded by Jack, AE8P. All in favor.

#### **VE Testing: Allen Sellers, KB8JLG**

Allen said we had an excellent turnout for the February exam. 10 people passed. Next test is April 20th. Allen stated he would be acting as VE for amateur testing at the Athens Hamfest.

#### **Monday Night Net: John Fick, KD8EEK**

March 10 John, W8OF

March 17 John, W8AGS

March 24 John, KD8EEK

March 31 Rob, KD8DXC

#### **Ragchewer: Jack Travis, AE8P**

Nothing to report. Submit any article, news item, cartoon, or other ham related bits of trivia to Jack at [k8qik@columbus.rr.com](mailto:k8qik@columbus.rr.com)

#### **Emergency Coordinator: Ed Campbell, WD8PGO**

Ed not present but Charlie said that May will start the emergency exercises and Ed will be asking for volunteers.

Mary, KD8EEI reminded everyone of the weather spotters training to be held on March 24th at the Liberty Center, 951 Liberty Center Drive, Lancaster at 6:30 p.m. to 8:30 – 9 p.m.

Please call the Fairfield County EMA office at 654-4357 M-F 8 to 4:30 p.m. if you wish to attend. There is no cost for this training. If you have previously attended a class and it was more than one year ago, you need to renew your training.

#### **Safety: Scott Snoke, WD8IXO**

No report

#### **Station Engineer: John Hilliard, W8OF**

John reported that the new amplifier stopped working on Feb. 13th and John mailed it back with insurance and since it was under warranty, there was no cost to repair. John needs reimbursed for \$69.41 cost for postage and insurance to mail back. Allen, KB8JLG made a motion to pay John, W8OF \$69.41, seconded by Jeff, WD8JLI. All in favor.

John reported that APRS information has been sent out to all members with e-mail and John has set up the APRS with no cost to the club.

**Activities Manager: John Fick, KD8EEK**

50/50 winner was Greg, W8NGA – not present therefore no winner - \$9.00 collected.

John, KD8EEK asked for members to let him know if they are interested in taking a Fun Bus to the Dayton Hamfest on May17th. If we have 26 people, the cost would be \$35 per person.

John purchased materials needed to build a 2-meter yagi per the instructions shown on the K8QIK web site. He wants to try for 27 March as a build night at the clubhouse and if the weather is not good for an outdoor test then the alternate date will be April 10<sup>th</sup>.

**Flower Fund: Ed Bennett, KD8EEJ**

\$19.00 collected and (Jack), AE8P won \$9.50.

A contribution has been sent in memory of Richard Harrison, W8QCO.

Reminder to all members to let Ed know if someone is sick and a card needs to be sent or if a member passes away so a contribution can be sent on behalf of the club.

**Old Business:**

Charlie has set up March 15th for the antenna check. Volunteers were given their location assignments.

**New Business:**

John, W8OF said the Cambridge Amateur Radio Association, W8VP, is coordinating a multi-county special event to commemorate the first road opening Ohio to settlement, which will be similar to the Route

66 special event. We are hoping to have Zane’s Trace special event stations on the air in Wheeling, WV; St. Clairsville, Cambridge, Zanesville, Chillicothe, Lancaster, OH; and Maysville, KY. The special event will take place on July 19 and 20. Is there anyone who would like to volunteer to set this event up?

Rob, KD8DXC said his wife had asked him to request our club’s assistance with communications for the Relay for Life (breast cancer) event that will be held at the Lancaster Fairgrounds in June. Rob will get more details and report back for a final answer.

Charlie said March 16th is Toledo Hamfest and April 12th is Jackson Hamfest.

Charlie said John Kochis and Bob Clark, Fairfield County EMA will attend our April meeting.

Charlie will try to schedule Sheriff Phalen for May.

Mark, KC8TUW read an article from the local newspaper on a Gannett Foundation grant that we may be eligible to apply for up to \$2,500 (items required, type of equipment being requested and amount, project to be served, if project new or ongoing, individuals to benefit from project, etc.). The request for grant is due by August 15th. Don, WD8PCF made a motion to have Mark proceed with checking on eligibility for club and if so, prepare documents necessary to request the grant. Second by Rob, KD8DXC. All in favor.

Ed, KD8EEJ motion to adjourn, second Bob KD8EXK. Motion carried. Meeting adjourned at 8:35 p.m.

Respectfully submitted,  
Secretary, Mary Travis, KD8EEI

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**Upcoming Hamfests**

**March 16th** is The Toledo Mobile Radio Association Hamfest and Computer Fair in Maumee, Ohio. Additional information is available from <http://www.tmrahamradio.org>

**Tubes For Sale**

If you need tubes for your boat anchor or TV contact Jeff Bell WD8JLI at 614-774-2973 or email at [jbelle@imagearray.net](mailto:jbelle@imagearray.net) he has a huge supply for most needs

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**E-mail Addresses and Phone Number**

If you are currently receiving The Ragchewer via regular mail but have an Internet account, the Ragchewer can be sent to you and save the club some money. You’ll also get your Ragchewer about a week earlier. Send me your e-mail address and tell

me to take you off the snail mail list. If you have a new email address or telephone number, be sure to also let me know. Send to [K8QIK@columbus.rr.com](mailto:K8QIK@columbus.rr.com)

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If you need a converter box for your TV starting February 2009, this is probably a better site as it shows both how to make a purchase on line and by

telephone. Both will probably have shipping charges so one should look at that also. Ralph, W8BVH <https://www.dtv2009.gov/VendorSearch.aspx>

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## February VE Testing Results

By Allen Sellers

The February 17, 2008 VE session at the clubhouse was fairly large this time. We had 10 applicants and some who called did not attend. We had 8 VE's and I want to express my appreciation to every one of them as the number was not too large and the session went smoothly. The VE's were Gary, W8GTS, Bob, KI8JM, John, W8AGS, Jack, AE8P, Greg, W8NGA, Allen, KB8JLG and Joel, KD8GTL who helped for the first time. Gene Pierce AB8DU came to get his license renewed and since he brought his VE ID card, stayed and helped administer the exam.

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We had 10 applicants and the results were 1 renewal, 4 Technicians, 4 Generals and 1 Extra license earned. One of the Technicians was a student of Bob's KI8JM and the Extra was a long-time General Class and retired Electrical Engineer from AEP who got a perfect score. Two of the successful Technician applicants tried the General exam but did not pass. At a cost of \$14 per session, it is worthwhile to spend time studying the General and trying to pass it at the same time for no additional fee.

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## The Wayback Machine #21

By Bill Continelli, W2XOY

In May of 1970, with the Vietnam War in full swing, the United States invaded Cambodia for the purpose of rooting out the Communists using that country as a base of operations. This led to protests at College campuses across the nation, and the deaths of four students at Kent State University in Ohio. At this point, the demonstrations exploded on virtually every major campus nationwide.

One problem facing the leaders of these protests was how to exchange news and information with their collegiate brothers and sisters on other campuses. The internet was in it's embryonic stage, and available to only the military and a few select universities; network news and wire services were not to be trusted (after all, they were run by people over the age of 30); the mail was too slow, and in a shambles after the recent postal strike; and long distance telephone calls were too expensive for students surviving on part time jobs and Care Packages from their parents. Thus, they turned to an institution that was prevalent at that time on almost every college campus--Amateur Radio. The Student Information Net was born.

The net appeared on 7260 kHz and 14.294 MHz in the 40 and 20 meter bands. Net Controls included K1WGM, at Brandeis University in Waltham, MA, and W2UC, at Union College in Schenectady, NY. At first, the net was used solely for the purpose of gathering and exchanging information as to what was happening on the various campuses nationwide. The net was so good at this, as a matter of fact that they began to feed news to the wire services and the major

networks.

However, the net soon expanded in scope, and that's where the trouble began. Dialog was encouraged among the various participants on the merits of the war, and what type of protests should be used. News bulletins were passed as traffic, to be rebroadcast on the college radio stations. Funds were solicited for the continuation of the student strike activities. Traffic was passed encouraging students to send their draft cards to Washington D.C. for a massive bonfire. A boycott of Coca Cola was discussed, as well as a demonstration to be held at Fort Dix on May 16. W2UC and W3EAX exchanged information on the demonstration at the University of Maryland and the attempt to block U.S. Route 1. W2UC claimed that they were forwarding all information received to a "clearing center", the location of which was not specified.

Then it started--the jamming, the deliberate interference, and the name calling by several unidentified stations. The net continued through the jamming, and operated for about a month- -long enough for the U.S. to withdraw from Cambodia, and for the summer break to arrive. But the controversy was just beginning.

The July, 1970 issue of QST contained an editorial in which the ARRL stated that the use of the amateur bands for heated political discussion was a self imposed taboo in amateur radio. They said that because of amateur radio's international status, what goes out over the air could have negative political consequences for us at future radio conferences. As a result, according to the ARRL, there was no place on

the amateur bands for arguing about the Vietnam War, advocating resistance to the draft, and talking about the new and permissive morality. The ARRL also condemned the jammers, stating that "Frontier Justice", vigilantes, and "Joe McCarthyism" had even less place than politics in amateur radio.

The letters from hams poured into QST. By a 2 to 1 ratio, they opposed the use of amateur radio for political purposes. One writer stated the net was a violation of national security and notified his local FBI office. Another stated that the net advocated mass disobedience to the laws of the land. One amateur stated, "We must keep politics and jammers off the amateur bands. A political discussion on the amateur frequencies is as inappropriate as a political speech on an air traffic control channel". The ARRL's reference to "McCarthyism" brought a rebuke from an amateur who said that Joe McCarthy was a "great American", who was proven correct in every case. And finally, one letter called the net participants "creeps", and sympathized with those who caused the QRM.

On the other side, supporters of the net were appalled at the deliberate jamming and claimed that the net was non-political, provided accurate

information, facilitated good will, and prevented false rumors. Members of the Student Information net claimed that the traffic passed was legal and was eventually carried by the UPI & AP wire services.

Several writers brought up constitutional issues, claiming that the First Amendment gave the net operators the right to do what they did, as well as the right for every amateur to discuss anything, including unpopular causes, on the air. One ham, ex-W6SDW, condemned the anti civil libertarian attitude of the ARRL & a majority of hams, and gave up his license as a protest.

The Student Information Net lasted only one month, but it opened the door to the concept that amateur radio did not exist in a technical vacuum, and that discussions of current political and social events were allowable on the amateur bands. Have we gone too far in the "anything goes" direction? That's up to you to decide. As a postscript, W2UC has recently been reactivated at Union College. If you ever hear it on the air, remember the role it played in amateur radio history 28 years ago.

In our next installment, we are going to jump back in time to the depths of the Great Depression, the early 30's. I hope to see you then.

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## Richard E. "Dick" Harrison, W8QCO - SK

**Aug 16, 1922 – Feb 18, 2008**

Mr. Harrison was a 1940 graduate of Utica High School. He was a World War II Navy veteran. He attended the Radio Engineering School, Valparaiso, Ind., to acquire his commercial radio license so he could work at radio stations. After graduation, he went to work at WCLT radio in Newark from 1948 to 1956. After eight years at WCLT, Dick went to work in 1956 at ODOT and retired in 1984. He was a member of the Neal Avenue United Methodist Church, past master of the Utica Masonic Lodge, and a member of the Scottish Rite. He was an avid golfer

and a ham radio operator.

He is survived by his loving wife of 58 years, Mary L. (Goode) Harrison, whom he married June 19, 1949; daughter, Debbie (Tim) Moore, of Lewis Center; son, Jim (Cheryl) Harrison, of Midland, Mich.; brother, Thomas Harrison, of Chicago; two grandsons, Luke and Kirk Harrison, both of Midland, Mich.; sister-in-law, Frances Harrison, of Newark; and numerous nieces and nephews.

In addition to his parents, he was preceded in death by his brothers, Robert and William Harrison.

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## ARRL Radio Amateurs Handbook 10th Edition

Editors note: This is a fun list issued in 1933 – well worth reading.

### Wireless Don'ts

**Don't** use iron wire for your aerial.

**Don't** fail to insulate it well at both ends.

**Don't** have it longer than 75 feet for sending out a 200-meter wave.

**Don't** fail to use a lightning arrester, or better, a lightning switch, for your receiving set.

**Don't** fail to use a lightning switch with your transmitting set.

**Don't** forget you must have an outside ground.

**Don't** fail to have the resistance of your aerial as small as possible. Use stranded wire.

**Don't** fail to solder the leading-in wire to the aerial.

**Don't** fail to properly insulate the leading-in wire where it goes through the window or wall.

**Don't** let your aerial or leading-in wire touch trees or other objects.

**Don't** let your aerial come too close to overhead wires of any kind.

**Don't** run your aerial directly under, or over, or parallel with electric light or other wires.

**Don't** fail to make a good ground connection with the water pipe inside.

### Transmitting Don'ts

**Don't** attempt to send until you get your license.

**Don't** fail to live up to every rule and regulation.

**Don't** use an input of more than 1/2 a kilowatt if you live within 5 nautical miles of a naval station.

**Don't** send on more than a 200-meter wave if you have a restricted or general amateur license.

**Don't** use spark gap electrodes that are too small or they will get hot.

**Don't** use too long or too short a spark gap. The right length can be found by trying it out.

**Don't** fail to use a safety spark gap between the grid and the filament terminals where the plate potential is above 2,000 volts.

**Don't** buy a motor-generator set if you have commercial alternating current in your home.

**Don't** overload an oscillation vacuum tube as it will greatly shorten its life. Use two in parallel.

**Don't** operate a transmitting set without a hot-wire ammeter in the aerial.

**Don't** use solid wire for connecting up the parts of transmitters. Use stranded or braided wire.

**Don't** fail to solder each connection.

**Don't** use soldering fluid, use rosin.

**Don't** think that all of the energy of an oscillation tube cannot be used for wave lengths of 200 meters and under. It can be, if the transmitting set and aerial are properly designed.

**Don't** run the wires of oscillation circuits too close together.

**Don't** cross the wires of oscillation circuits except at right angles.

**Don't** set the transformer of a transmitting set nearer than 3 feet to the condenser and tuning coil.

**Don't** use a rotary gap in which the wheel runs out of true.

### Receiving Don'ts

**Don't** expect to get as good results with a crystal detector as with a vacuum tube detector.

**Don't** be discouraged if you fail to hit the sensitive

spot of a crystal detector the first time--or several times thereafter.

**Don't** use a wire larger than No. 80 for the wire electrode of a crystal detector.

**Don't** try to use a loud speaker with a crystal detector receiving set.

**Don't** expect a loop aerial to give worthwhile results with a crystal detector.

**Don't** handle crystals with your fingers as this destroys their sensitivity. Use tweezers or a cloth.

**Don't** imbed the crystal in solder as the heat destroys its sensitivity. Use "Wood's metal", or some other alloy, which melts at or near the temperature of boiling water.

**Don't** forget that strong static and strong signals sometimes destroy the sensitivity of crystals.

**Don't** heat the filament of a vacuum tube to greater brilliancy than is necessary to secure the sensitiveness required.

**Don't** use a plate voltage that is less or more than it is rated for.

**Don't** connect the filament to a lighting circuit.

**Don't** use dry cells for heating the filament except in a pinch.

**Don't** use a constant current to heat the filament, use a constant voltage.

**Don't** use a vacuum tube in a horizontal position unless it is made to be so used.

**Don't** fail to properly insulate the grid and plate leads.

**Don't** use more than 1/3 of the rated voltage on the filament and on the plate when trying it out for the first time.

**Don't** fail to use alternating current for heating the filament where this is possible.

**Don't** fail to use a voltmeter to find the proper temperature of the filament.

**Don't** expect to get results with a loud speaker when using a single vacuum tube.

**Don't** fail to protect your vacuum tubes from mechanical shocks and vibration.

**Don't** fail to cut off the A battery entirely from the filament when you are through receiving.

**Don't** switch on the A battery current all at once through the filament when you start to receive.

**Don't** expect to get the best results with a gas-content detector tube without using a potentiometer.

**Don't** connect a potentiometer across the B battery or it will speedily run down.

**Don't** expect to get as good results with a single coil tuner as you would with a loose coupler.

**Don't** expect to get as good results with a two-coil tuner as with one having a third, or tickler, coil.

**Don't** think you have to use a regenerative circuit, that is, one with a tickler coil, to receive with a vacuum tube detector.

**Don't** think you are the only amateur who is troubled with static.

**Don't** expect to eliminate interference if the amateurs around you are sending with spark sets.

**Don't** lay out or assemble your set on a panel first. Connect it up on a board and find out if everything is right.

**Don't** try to connect up your set without a wiring diagram in front of you.

**Don't** fail to shield radio frequency amplifiers.

**Don't** set the axes of the cores of radio frequency transformers in a line. Set them at right angles to each other.

**Don't** use wire smaller than No. 14 for connecting up the various parts.

**Don't** fail to adjust the B battery after putting in a fresh vacuum tube, as its sensitivity depends largely on the voltage.

**Don't** fail to properly space the parts where you use variometers.

**Don't** fail to put a copper shield between the variometer and the variocoupler.

**Don't** fail to keep the leads to the vacuum tube as short as possible.

**Don't** throw your receiving set out of the window if it howls. Try placing the audio-frequency transformers farther apart and the cores of them at right angles to each other.

**Don't** use condensers with paper dielectrics for an amplifier receiving set or it will be noisy.

**Don't** expect as good results with a loop aerial, or when using the bed springs, as an out-door aerial will give you.

**Don't** use an amplifier having a plate potential of less than 100 volts for the last step where a loud speaker is to be used.

**Don't** try to assemble a set if you don't know the difference between a binding post and a blue print. Buy a set ready to use.

**Don't** expect to get Arlington time signals and the big cableless stations if your receiver is made for short wave lengths.

**Don't** take your headphones apart. You are just as apt to spoil them as you would a watch.

**Don't** expect to get results with a Bell telephone receiver.

**Don't** forget that there are other operators using the ether besides yourself.

**Don't** let your B battery get damp and **Don't** let it freeze.

**Don't** try to recharge your B battery unless it is constructed for the purpose.

### Storage Battery Don'ts

**Don't** connect a source of alternating current direct to your storage battery. You have to use a rectifier.

**Don't** connect the positive lead of the charging circuit with the negative terminal of your storage battery.

**Don't** let the electrolyte get lower than the tops of the plates of your storage battery.

**Don't** fail to look after the condition of your storage battery once in a while.

**Don't** buy a storage battery that gives less than 6 volts for heating the filament.

**Don't** fail to keep the specific gravity of the electrolyte of your storage battery between 1.225 and 1.300 Baume. This you can do with a hydrometer.

**Don't** fail to recharge your storage battery when the hydrometer shows that the specific gravity of the electrolyte is close to 1.225.

**Don't** keep charging the battery after the hydrometer shows that the specific gravity is 1.285.

**Don't** let the storage battery freeze.

**Don't** let it stand for longer than a month without using unless you charge it.

**Don't** monkey with the storage battery except to add a little sulphuric acid to the electrolyte from time to time. If anything goes wrong with it better take it to a service station and let the expert do it.

### Extra Don'ts

**Don't** think you have an up-to-date transmitting station unless you are using C.W.

**Don't** use a wire from your lightning switch down to the outside ground that is smaller than No. 4.

**Don't** try to operate your spark coil with 110-volt direct lighting current without connecting in a rheostat.

**Don't** try to operate your spark coil with 110-volt alternating lighting current without connecting in an electrolytic interrupter.

**Don't** try to operate an alternating current power transformer with 110-volt direct current without connecting in an electrolytic interrupter.

**Don't**--no never--connect one side of the spark gap to the aerial wire and the other side of the spark gap to the ground. The Government won't have it--that's all.

**Don't** try to tune your transmitter to send out waves of given length by guesswork. Use a wave meter.

**Don't** use hard fiber for panels. It is a very poor insulator where high frequency currents are used.

**Don't** think you are the only one who doesn't know all about wireless. Wireless is a very complex art and there are many things that those experienced have still to learn.

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## What Is An Antenna Tuner?

Yes, "TRICK" YOUR RIG!

You have to learn how to hook them up to your transceiver properly and tune them correctly to make your radio think that it is feeding it's signal into a "perfect or near perfect 50 ohm load called your antenna.

An antenna tuner, (transmatch), doesn't really TUNE your antenna OR ANY PART OF IT!

What an antenna tuner or transmatch does do, however, is transform the impedance at the antenna feed output at the radio to a value that your transceiver can handle, (typically 50 Ohms).

When thinking about antenna tuners and SWR, it's important to remember that the tuner has no effect whatsoever on the SWR between itself and the antenna.

It's the SWR between the transmitter and the tuner that is changed with the tuner controls.

In layman's terms, all a tuner does is act as a kind of adjustable impedance transformer between the radio and the antenna. It takes whatever impedance the antenna system presents, up to the design limits of the tuner, and attempts to convert it back to 50 Ohms--or something reasonably close to that value for the transceiver. When the transceiver "sees" 50-Ohm impedance, it is able to load or produce its maximum designed RF output into the system because it is designed to operate into a 50-ohm load.

Your rig "thinks" it's seeing a 50-ohm antenna on it's output!

That power is transferred through the antenna tuner, to the feed line and, ultimately, to the antenna--minus any losses incurred along the way.

If you have high losses and a poor excuse for an antenna, you will have a poor excuse for a good signal no matter how well your tuner "tricks" your radio.

Most of the power will be lost as heat in the tuner and very little will get to the other station!

These losses are the reason that the highest efficiency feed-line for each individual case is desirable and why some amateurs use ladder line on HF, which has the least loss per foot, which means maximum power at the input terminals of the

antenna.

### HOW TO HOOK UP AND USE

So now that you have a better understanding of what an antenna "tuner" actually does, let's hook one up in a typical HF station.

In the block diagram we have typical HF station setup consisting of:

An HF Transceiver

A Linear or power amp

Low Pass Filter

SWR / Watt Meter combo

The Antenna Tuner

A Dummy Load

The MOST IMPORTANT PART.....THE ANTENNA!

Take a look at the block diagram above and notice where the antenna tuner and SWR meter are in relation to the flow of the RF signal coming from the transceiver.

PLEASE DISREGARD THE LINEAR AND LOW PASS FILTER FOR THE MOMENT! (Your station may not use them)

You will notice that.... first, from left to right, you have the transceiver, SWR/watt meter, ANTENNA TUNER and then the antenna on the output.

The RF moves from the transceiver to the SWR/WATT meter, then finally thru the "tuner" and out to the antenna.

You just learned how to hook it all up! Just remember that our goal is to make the transceiver think all is well, and in order to "read" the SWR and Power out pertaining to "all is well".....at the radio's output...the meter must be between the radio and the tuner. NOT ON THE ANTENNA SIDE!

NOW LET'S LEARN TO TUNE THAT TUNER!

Most antenna tuners have an inductance rotary switch and two capacitors. The capacitors are often labeled ANTENNA and TRANSMITTER. In some antenna tuners the inductance switch is replaced with a continuously variable inductance, popularly known as a roller inductor.

Let's assume you're using a tuner with an inductance switch, because they are the most



common.

**SHOCK HAZARD! NEVER TRANSMIT WITH THE TUNER COVER OFF AS IN THE NEXT STEP TURN OFF THE POWER TO THE RADIO!**

Place both capacitor controls at their mid-range positions. Don't trust the knob markers if this is your first experience with the tuner! If you are comfortable with the next procedure, remove the cover of the tuner and turn the knobs until the moving capacitor plates are only half meshed with the stationary plates. If the knobs are pointing to half scale with the reference markings on the knobs and front cover, consider yourself lucky.

If not, loosen their Allen screws and rotate the knobs so that they point to mid scale.

Re-tighten the knobs, replace the tuner cover and you're ready to go.

Turn the radio on and tune receiver to an un-used frequency on the band you desire, listen for a few seconds, with the antenna and transmitter controls at mid scale, move the inductance switch to each of it's positions until you hear the loudest noise or signals coming into your radio.

Then, rotate the antenna and transmitter controls until you get to the absolutely loudest noise or signal level on the radio. All three of these controls interact with each other so practice on several bands to get the "feel" of the procedure.

Select your final band of operation and repeat the procedure above. When noise peaks out using your ears and the S meter, your tuner settings should be very close for final operation. With your rig set to low power monitor the frequency to assure that it is not in use, send your ID then transmit a continuous carrier while you tweak the antenna and transmitter controls for the lowest reflected power reading with the highest output power as read on the SWR/Watt meter. You may find that you have to vary the position of the inductance switch a position or two either way to get your best match.

Play it safe and un-key before turning the inductor switch...un-key first....turn the switch...key up....repeat as needed until lowest SWR and maximum output. Be gentle to your radio; keep the key-down periods as short as possible. Depending on the impedance at the antenna input (and the overall design of the tuner) you may not be able to obtain a flat 1:1 SWR on all frequencies and bands.

Also important to remember is that your SWR will change, go up, as you tune further away from the

frequency you used to "trick" your radio! So re-check and re-tune as needed as you move around the band.

You can get an idea of your SWR bandwidth by starting with your original frequency, and using the procedures above with low power, (don't move any knobs or switches after best setting)....sweep or tune your VFO up and down the band while watching the SWR readings and note the frequency where the SWR reaches 2:1 at the highest and lowest frequency. Stop there!

Example: If your on 40 meters at say...7.262mhz as your starting point, and your SWR is 2:1 at 7.292mhz and the highest going the other way is 2:1 at 7.259mhz, then your "safe tuning range" without retuning the antenna tuner would be about 60khz.

Keep in mind to use very low power and ID because your signal may be heard for a split second as you tune across the band! When that transmit key is down, someone somewhere can hear you. Even a dummy load gets out somewhere!

Remember your "TRICKING" your way around a good antenna!

**Note:**

In reality, there is no "tricking" and we were playing with words here like "tricking, fooling", etc.

It is useful to employ a matching device, the antenna tuner, between the transmitter and the antenna feeder when antennas with complex impedances are used..... so the transmitter will "see" a 50 -52 ohm load even though a significant mismatch is present at the antenna feed point. The tuner, matchbox or transmatch as it is sometimes called, will not correct the actual SWR condition on the feed line OR antenna, but it will resonate the antenna system as a whole and allow the transmitter to deliver as much power to the antenna system as possible within the design parameters of the tuner. The transmitter now can produce it's rated power out to the tuner in the hopes that the tuner can do it's job and get most of that power into the antenna system with some efficiency.

Bottom line: Your transmitter will not know that you are trying to "load up" those old rusty bed springs or that poor excuse for an antenna! Just because you're now seeing that magic 1 to 1 VSWR reading on the meter does not mean you have changed the design of those old rusty bed springs you're trying to use as an antenna!!! The more efficient your antenna system the better!

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