9-93

Zero Beat

Hampden County Radio Association, Inc. - our 46th ARRL affiliated year

Volume 2, No. 1 September 1993

Next HCRA Meeting

The next Hampden County Radio Association meeting will take place on September 10, 1993 and will feature a long awaited topic, a DXpedition. Come join the fun as you become entertained by a professional video presentation of the PJ9W contest effort from Curacao island. This is a spectacular look on the planning, set-up and operation involved in running a successful DXpedition. The tape is approximately one hour long. For this meeting we will have a large screen television for a flamboyant look at this effort. Doors open at 7:30 and the meeting will start promptly at 8:00 P.M. So don't be shy, come out and have a ball, and socialize with your fellow hams. Hope to see you there!!

Feeding Hills Congregational Church
Route 57 & 187
Feeding Hills, Massachusetts

Comming in October: **Evan Rubin** from Channel 22!

Board of Directors

Officers

President	VACANT	Your name
Vice President	VACANT	could be here!!
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Secretary	N1DUY	Jim Sebolt

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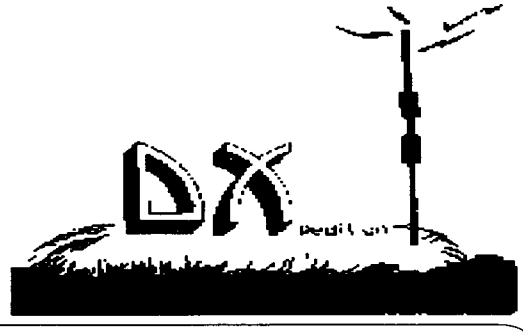
N1FOW	Mike Griffin	N1IJK	Barry Mason
NR1L	Kevin Hilinski	N1GVV	Adam Olson
K1MVR	Dave Olson	WA1OHR	Everett Paluska

IN THIS ISSUE....



This Month's Meeting: PJ9W DXpedition

The New and Improved HCRA.....

Welcome to an exciting new year with the Hampden Country Radio Association! September means a brand new year for the HCRA and some exciting new plans to boot. This is a year for new ideas and new activities that will revolve around you, the member. But, as members we have to know what you want changed. At the beginning of the September meeting a questionnaire will be passed out to see what you as members would like the HCRA to pursue. This involves things such as meeting topics, contests, and other club activities. Remember however, your opinions cannot be pursued unless we know what you want. Please attend the first meeting to fill out the questionnaire. It is just as important to the whole club as it is to you. All questionnaires will be anonymous, so your opinion will be kept confidential. Some of these questions include ideas like meeting topics, pizza at the beginning of every meeting instead of doughnuts and coffee, the year end banquet and awards ceremony, and field day.

One of the goals set by the board of directors is increasing the attendance size at all of the meetings. If you have not been to a meeting in a long time please try to come and see what some of the changes in mind are. Remember you do not have to be a member to attend the meeting and we encourage bringing non-hams to see how exciting ham radio can be. We would also as a general interest like to keep some of the topics in the ham radio field but would like to bring back those meetings that are not radio related. An example of this is the October meeting on severe weather.

The board of directors are really looking forward to the upcoming year. The last board meeting was a success with many things accomplished. As of now we have tentatively in mind the meeting topics up till the December Christmas social. Another positive sign is the HCRA is planning to reinstate the Tech Corner. At the next board meeting we will be discussing this idea more. If you are interested in taking part in Tech Corner please contact any member of the board or drop a note to the clubs address. The HCRA is also planning a novice/technician class. Please see future issues of Zero Beat if interested.

Some of you out there may be concerned with the vacancies of both the President and Vice-President positions. However, one positive sign is that all of the director positions have been filled, along with the Secretary and Treasury. If you have interest in becoming involved in the club, this may be the opportunity you have been waiting for. Anyone in the club can fill these positions. Please attend the September board meeting and let us know. We will announce the location of this board meeting at September meeting. Remember, anyone can attend these meetings. This would be ideal to see what is involved in running the club. The board will continue to work hard and fill these positions. We feel that this can be achieved, as things seem to be looking up.

Finally, you will notice the application form in the back of this issue. To avoid Zero Beat cutoffs, please renew. Your membership expiration date is located on your ZB mailing label. You may mail it in, or see Greg, N1AEH at the next meeting. Please renew as the HCRA is planning some pretty exciting things in the upcoming year, give the HCRA a try, you will not be disappointed. Tell a friend about our club as well, it is an excellent place to socialize and make new friends. Well, looking forward to serving you this year!

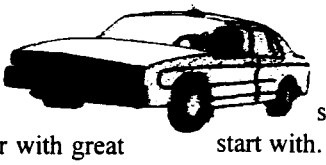
73, HCRA Board Of Directors

Zero Beat is a monthly publication by the Hampden County Radio Association, Inc. Any article may be reprinted as long as credit is given to the publication and it's author(s). This issue would not be possible without the help of your board of directors. Special thanks also go out to Jerry Griffin, WA1PGT, for use of his computer equipment. Thanks, editor (NR1L).

CONSTRUCTION

Mobile Noise Reduction

LAWRENCE EARL, KG7DL
WORLDRADIO, January, 1993



Did you ever put an HF rig in a car with great expectations only to find that when the motor was running all you could hear was the motor? Well, join the crowd. The first time I did that was in a 1969 Datsun pickup. The noise level was S9. My next was a 1972 Ford Courier pickup, the noise level in that one was S7. So I was forced to learn something about noise reduction whether I really wanted to or not. I did have the benefit of the Navy's noise training, as one of the country's leading experts on electrical noise came to the base where I was working and gave a course on noise suppression.

The average mobile installation is a VHF rig on FM. Almost all man-made noise is AM, so a good FM rig will not respond to the noise the car is putting out and you will never know it is there. But sideband is an AM mode and is susceptible to noise.

The first thing you will hear is the ignition, then the alternator whine, and the rest of the noise will generally be covered up by whatever is the loudest, usually the ignition. That's the popping you hear that is in tine with the engine speed.

Noise is funny stuff in that it works somewhat like static electricity; it doesn't go anywhere. You can rub the center of a big sheet of plastic and go over it with a static voltmeter and the voltage will be in the center right where you rubbed it, not on the edges or anywhere else. Noise voltage isn't quite like that, but it is peculiar. For instance, you start the motor and listen for awhile, then go out and raise the hood. If the noise doesn't increase a whole bunch it means the hood isn't doing much of a shielding job. So then you ground the hood and it gets worse! It's entirely possible.

If the hood isn't well grounded the ignition will induce circulating currents in the sheet of metal of the hood, which will radiate. When you ground the hood it provides a good return path for the noise current through a rather small ground wire. The current density in that wire can be quite high, which can result in the hood acquiring the characteristics of a knob on top of an antenna; then the hood, and particularly the ground wire, will radiate. As this radiation effect may only occur in some cases, a good rule of thumb is to ground the hood.

My favorite grounding material is a half-inch braid. I bought a whole roll of the stuff one time. I use a 300W soldering iron and tin the end edge to start with. I use a soldering iron instead of a torch, as I discovered the torch will oxidize the metal before it gets hot enough to tin. Then I use a punch to poke a hole immediately in back of the tinning , making a hole big enough to take the screw that will be going through it. Then I tin the rest of the braid to about an inch above the hole. I make a few technical adjustments on the tinned end with a hammer to ensure it's flat. Now I have about two inches of the end of the braid tinned with a hole through it. Do this to both ends of the braid, and don't forget to make it long enough.

I use a large, short sheet metal screws which can be installed with a socket wrench. Scraping the paint from the hole I back the screw with a large washer, insert the screw through the ground strap, and add a star-washer before inserting the screw into the hole. The star-washer bites into the metal in several places and gives a much better ground. Every once in a while I give all the grounds a squirt of a rust preventative compound, such as CRC, LPS, or WD40.

First try grounding the hood on one corner near a hinge and see if it does any good. The formula, "If enough is good, more is better, and too much is just right," doesn't always apply to grounds. Sometimes if you ground a hood in two places the noise will increase because you have created a current loop. Small ground wires are not as good as big ones; the current density in a small ground wire can be so high that it will radiate and make things worse. That's why you see a long strip of sheet copper, rather than braid, used as a ground strap on some grounded electric work benches.

From the Beginning

The first thing to do in mobile noise reduction grounding is take the ignition coil off. Scrape the paint off the contact points of the coil and mounting strap. Any arcing outside the engine can also cause

Continued on Page 4

Construction (Cont.): Mobile Noise Reduction

a terrific amount of noise, so be sure your spark plug wires are in good shape. In the dark, observe the running motor and see if you can see any arcs. If you can, it's long past time to change the spark plug wires. If the ends of the wires fit loosely on the plugs and distributor cap connections they will arc and cause noise. Take the wires and slide the rubber covers back so you can get at the end connectors (you may have to use some silicone grease).

Take an old spark plug and fit the end connectors on them so they are tight. I just mash them a little with a pair of pliers. (Spark plug connectors are made with a dent in the middle that makes them snap on, but after they get there they become loose, and that's what you want to avoid.) Fit all the connectors on both ends of the wire, and don't forget the one that goes to the coil. This will cut ignition noise a tremendous amount. If you still need more suppression, get some suppression spark plug wires; it's a coil wrapped around a magnetic plastic core. As a coil, half the noise voltage radiates inward and cancels itself. It also serves as a resistance wire.

You say that's not quite right - you want it perfectly quite? Okay, measure the distributor and coil diameter, take your ruler and head to the supermarket, it's time to shield the whole works! What you want is a can that will fit over the coil and distributor. If other shoppers look at you kind of funny, just tell them you always buy your beans by the inch.

Then get some very thin tin or galvanized sheet metal to wrap around the spark plugs. Cut the sheet metal in a strip that's a little longer than the distance from the plug seat to the top of the plug. Then cut a piece that will wrap around the plug hex with enough overlap to solder. Cut another piece of sheet metal and wrap it around something like a broom handle or pipe, forming it so that it is halfway between the diameters of the outside and inside of the plug hex, and solder it up the seam. Now when you force it on the plug it will stretch to go over the hex on the plug and make a tight fit. I form the sheet metal so it is a little bigger than the plug and then put it in a vice and squeeze it to the right diameter, then solder it.

Cut the two cans to go over the coil and distributor, making holes in the tops of the cans for the wires. Make a dozen or so cuts up the side of the can so it can be squeezed tightly onto the coil and distributor with a hose clamp. Clean the paint off the coil where the can fits. Be sure to get the can far enough down over the distributor to reach the metal. You will probably have to cut it to fit around several things on the outside of the distributor, like the vacuum assembly and the low voltage wire.

The half-inch braid is formed into a hollow tube and soldered to the hole edges that were turned up on the tops of the cans. Don't forget that the wires and plug boots are going to have to go through the braid and holes, so be sure to make them big enough. When you are all finished you will have a metal octopus that will completely eliminate all ignition noise, so if you've used a good solid braid.

Once the ignition monster is beaten all you may hear is alternating whine, which may go out over the transmitter too! Batteries are a big capacitor, but not that big, so something must be done. The easiest thing (I always take the easy way first) is to run a separate power lead to the battery. Use a piece of coax and go directly to the battery with both sides. Connect the shield to the ground side and the center to the hot side through a fuse. I just use a big lug over the clamp nut with another not on that to hold it.

If you have a GM car without regular battery terminal clamps, you have a problem. Get the power line as close to the battery as possible. On one car that had a clamp-on battery leads I drilled the battery terminals and put the power lead on top of the terminals with a sheet metal screw. That will cut noise to the radio quit a bit.

The sound insulation on the inside of the fire wall is held on most cars with rubber things like a big bolt. They are pushed through the insulation from the inside of the car and can be seen in the engine compartment. They are about 3/8 inch in diameter and are hollow. They have holes in them just the size of RG-58, Just cut the end off one in the engine compartment and fish the coax through it. Lacking that neat feature, you can usually get a line through along side the fire wall connector. If you can't find a cooperative connector it's time to get the drill and take the rubber grommets out.

All that work may still leave a lot of alternator whine. Since it's an AC source that has to be rectified, the way to eliminate the AC hum is the same as with any power supply. Get a big toroid core and wind it through the wire that goes from the alternator to the battery. That should do it.

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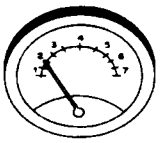
Construction (Cont.) Mobile Noise Reduction



Eventually the rain will come, along with more noise when you turn on the windshield wipers! The cure for that noise is feed-through capacitors, all metal, about two inches long and an inch in diameter. Get the kind that have screw terminals on the ends and a lug on the side to fasten them down. They are usually 1/4mF or 1/2mF and the power goes through them, They will all handle 20A or so. One of these will have to be put in each power line to the wiper and probably the ground wire too, if it goes back to the switch like mine did. Scrape the paint from underneath them where they are fastened to the fire wall to ensure a good ground.

About all that leaves is the voltage regulator for the instruments that go tick, tick, tick, and the stuff you can't find, unless you are unfortunate enough to have a mechanical voltage regulator-they regulate by vibrating and can set up an awful racket. Too much noise suppression on them can change the way the generator regulates. Some bypass capacitors will generally take care of them. Among sources you won't be able to find will be the exhaust system, which is about a quarter-wavelength on 10M and makes a fine antenna for noise from the ignition system. Ground it near the far end. Car bodies are rubber mounted and are often not too well grounded; you may have to run ground straps from one body part to another and from the body to the frame. Sometimes engines are not grounded either, except by accident. They always go back to the negative battery terminal, but that may not be too well grounded to the frame and body; one small wire for a DC ground for the lights, etc. doesn't always make a good noise ground.

Sometimes in dry weather you will hear static build up arcing to the ground from the tires. You can, with luck, get conical springs to put in the front wheel hubcaps to ground them to the axle, and conductive powder to put in the tires to help ground them, or you could drag a ground strap. That should do it. If it doesn't, then go bicycle mobile!

Future Meetings

September- This meeting the board has decided to feature a long awaited topic on a DXpedition. The feature will be a 60-minute, professionally produced video tape on the PJ9W expedition from Curacao. The tape, entitled "Spirit of Victory," gives a detailed account on exactly what goes on behind the scenes of a big time effort. Many of you have possibly wondered what it was like on the other side of the pile-up. This tape will give a good representation of what this is like. It should be an exciting meeting for all. Before the meeting we will be passing out simple surveys for you to fill out before the tape begins. We will be doing this at approximately 7:50 P.M. Please take this seriously, because the board will use them to try and improve the HCRA. They will differ from previous surveys in the past in that it will consist of approximately ten questions at the most. It will only take a minute or two to fill them out. The September board meeting will be announced at the September meeting.

October- This meeting looks to be extremely exciting and interesting. The board has planned the topic to be about something everyone talks about and is interested in, the weather. Currently the topic looks to be about severe weather and how ham radio helps out. The speaker looks to be an extremely well known meteorologist from Channel 22 in Springfield, Evan Rubin. Evan is often seen doing the weather on TV from the different newscast times. He is well educated on the topic and it should be a sight not to miss. Please check the next Zero Beat issue for more information on Evan, the topic he will talk on, and the meeting starting time. Be sure to tell your friends and join us for this meeting!

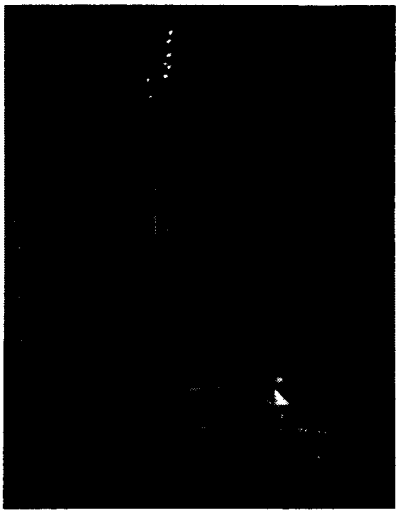
November- As always, the November meeting is reserved for an extremely popular event in the past, the annual auction. The rules will be announced in a future issue of Zero Beat. The auction is always a fun time for all. It is an excellent opportunity to purchase that long awaited tube, or socialize with fellow Hams. Please pass the word. Anyone can attend our auction, you do not have to be an HCRA member. Steve Nelson, WA1EYF will once again be the auctioneer.

December- The December meeting will again be the HCRA's annual social and show and tell. You will be permitted to bring your favorite radio toy and share it with the membership. Keep reading Zero Beat in the future for information all of of the HCRA's upcoming events. Also as the cold weather approaches, look for information on the HCRA's cancellation procedure to keep you informed.

Photo Highlights From Field Day 1993

Photos by John Balboni, AC1T

Jim Pierson (KC1ZN), busy away racking up contacts on 20 meters for HCRA.



The 15 meter station.

Larry (N1EPE), and his wife Diane (N1JJO), busy taking down antenna arrays after the successful field day event.

Kevin (NR1L), Mike (N1FOW), Jerry (WA1PGT) and Dave, (K1MVR) putting antennas back onto the HCRA field day trailer.

Hampden County Radio Association, Inc.

P.O. Box 482
West Springfield, MA 01090-0482

Application for Membership

Call Sign:_____.

New: _____ Renewal:_____.

Name: _____.
Address:_____.
City: _____ State: ____ Zip: _____.

Phone: (____) _____-_____Listed: Yes:_____No:____.

License:

___Studying___Novice __Technician __Tech+ __General __Advanced __Extra

ARRL: Life Member: _____ Member:_____.
VE: Advanced: ___Extra: ___General: ___Expiration:_____.

If you are a VE, would you be willing to participate in the HCRA's VE program?
Yes:__ No:___.

Regular HCRA membership is $10.00 The cost of the membership is used for items such as Zero Beat, the meeting hall, and insurance. Additional family members are FREE at no additional cost. Just mark these people in a free place on this form. If you are under 18 years of age, dues are only $5.00. Please consider including a donation to help the HCRA in future endeavors. All donations are tax deductible to the extent of the law. Please fill out this form and make a check payable to the Hampden County Radio Association, INC. to the address above, or bring the form to any club meeting. The HCRA appreciates your support.

Membership Dues: $ _____.
Donation: $ _____.
Total Enclosed: $ _____.

Field Day Results, 1993

by Mike Griffin, N1FOW

This years field day event was held at the same location as it has been for many years at the track field located at the Agawam High School. We had a lot more participation than we were expecting, some of these participants include (Kevin NR1L, Mike N1FOW, Jerry WA1PGT, Larry N1EPE, Dave K1MVR, Adam N1GVV, Scott KA1QAS, Jim KC1ZN, Fred N1DPM, Jeff N1KBY, Barry N1IJK, Everett WA1OHR, Stan KA1ZE, John AC1T, Bob K1CPJ, Bobbi N1JOG, Diane N1JJO, and Tony KA1HTJ). We operated as 3A Western Mass., 3 meaning that only 3 stations can operate at one time consisting of 15,20,40 and 80 meters and A meaning that our power source was from a generator.

As normal we encountered some problems but tried to work around them the best that we could. Conditions on 40m & 80m were not nearly as good as last years effort. The air conditioning in the CD truck that was loaned to us by the Agawam Civil Defense was not functioning and the temperature inside the vehicle reached 110° at one time. But all in all we had a fun time and didn't put ourselves out to get the most QSO's. We brought a grill and cooked Hamburg's and hot dogs, had grinders delivered to the track field, and had donuts given to us. We had a camper set up and a VCR to watch movies when band conditions were poor. But the biggest disappointment we had after much preparation for one was no thunder-storm. For the first time in many years we weren't blessed with a storm. The skies did get dark but no matter how much metal that we put into the air we were unable to attract a storm to our sight.

We are already getting geared up for next years field day effort. We are hoping that we will be able to operate a 4A or 5A and are hoping for more people than this year to give some sort of active participation. We hope that you will put some time aside next year and check-out how much fun that field day can be. Just a little effort can mean a lot to the club and how well we do as a club.

73, Mike N1FOW

N.E.W.S. Club Information

The New England Weak Signal Group, a recently formed radio club for VHF enthusiasts is planning to have their first meeting on Saturday September 25, at the Vernon Quality INN in Vernon, CT. This meeting will begin at 1:00 P.M. The planned topic is an EME extravaganza. It will cover the set-up, construction, and operation of a complete Earth to Moon station. The meeting will feature HCRA member Frank Potts, NC1I's famous antenna and station. The N.E.W.S. club is open to all amateurs and the first year dues are free with a nominal charge of $10 in future years. This club will meet four times a year at this location. For more information on this club, you may contact Stan Hilinski, KA1ZE at (203) 872-6197.

From The Editor's Desk.....

Well, it is hard to believe the summer is just about history! It sure went by fast. Now I am back in college for another semester of hard core studying. I hope everyone enjoyed it! Well at least we can now look forward to another year with the HCRA. I am particularly excited about the upcoming year. It proves to be stock full of exciting meetings. See elsewhere in this issue for more information on this topic. As an avid DX fan, I am especially looking forward to the videotape presentation of Radio Finland's DXpedition to Curacao! It should be quite interesting. I hope to see everyone there. I know it has been said in the past and many people I am sure of sick of reading it, but it must be printed again because I have not gotten any feedback. To put it bluntly, I need articles. Anything would be great and also well appreciated. It would sure make my job much easier. As it stands now, I am trying to search sources, such as *WORLDRADIO* (I only have two issues) for articles. If you send anything it can be in typewritten format, or on disk file such as ASCII or Word format. A high density disk 3 1/2 or 5 1/4 would be fine. I will return all disks. Please send all information by the 15th of each month to allow time for me to bring the article to the printers. Some of you who have been reading *Spotlight on the Crowd* each month may be curious as to why I no longer have it in *Zero Beat.* The simple reason is that I no longer have any ideas on what HCRA members to have in the issues. I have approached people, but I feel that this is putting people on the spot. I have also put a little note in the bottom of the articles for people to send me a biography or an idea of someone, but I only got one response. If you would like to see this article reinstated, please help out! The types of questions appear in past ZB's. Just send me a bio or perhaps a note suggesting one of your fellow hams. The issues will be impressive, providing I get help. This month I would like to thank Mike Griffin, N1FOW on helping me with this issue. Well, not much more from me, I hope to see you at the meetings.

73, Kevin NR1L
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Editor: Kevin S. Hilinski NR1L

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Forwarding + Address correction requested

First Class