



❖ The Minuteman ❖



Volume 27 Issue 3

January 1998

President's Corner

Andy Morrison, N1BHI

A couple of things....first, look for an interesting article in the next newsletter about a real Fox Hunt. Our erstwhile Fox Hunters had a chance to put all that fun practice to good use when a carrier came up on a south shore repeater, timing it out. Dave, KT1X, is preparing the story for the next newsletter. He and the crew did in about an hour - including travel time - what noone had been able to do all day in finding the offending transmitter.

Second, we owe a thankyou to Paul, N1ZBC, for donating a 70 foot tower to the club. He had acquired it a while ago, but was unable to use it. He offered it to the MMRA, and we were happy to receive it. We plan to use it to get the 6 meter antennas a little higher. More on that as our plans solidify.

Also, Bryan, W1BRI, tells me that the new G.E. based repeater for '82 is about ready. All that remains is to get it physically ready for installation. That should happen pretty soon. When it does, if our experience with G.E. repeaters holds up, you will note a significant improvement in the repeater receiver's sensitivity and selectivity.

You should plan to attend the meeting...our speaker, Mark Horenstein, WA1GIO, is going to talk about silicon Microtechnology. The applications are numerous and it should be an interesting talk. Mark is the main sponsor of the B.U. club and is reciprocating for our involvement in getting that group into Fox Hunting - the subject of the article in the last newsletter.

You might be interested to know that the MMRA is not Year 2000 compliant...we have used the old tried and true Dbase III for our membership database for the last 10 years. I wrote a series of programs that have been maintained and improved by Frank, KB1FZ, and those have been the core of our membership database maintenance process since. Dbase date processing was not capable of handling a 4 digit year. In addition, the expiration date that we have used since the membership data was on 3 by 5 cards was the last two digits of the year and two digits of month. That could have worked into the next century, but it would have looked silly and been confusing.

So, like so many other organizations, we decided not to attempt renovation of the system, and decided to replace both the database management software and the programs. I chose Access as the database, and migrated everything...so as of this month, Lynne, KA1NLD, is using the old and the new in parallel. As soon as we are satisfied with the stability of the new system, we'll abandon Dbase. The new system should prove easier to use...and the membership certificate will have a new look, including a full date for membership expiration.

A Hunt In The Eye Of Hurricane Zena

Dave Croll, KT1X

On Saturday morning, December 6, the MMRA repeaters were used as part of an ARES/RACES emergency preparedness drill, the Simulated Emergency Test. Our MMRA emergency liaison Marty, N1QIR, served as net control as stations from throughout Eastern Massachusetts reported the local weather conditions resulting from the passage of the fictitious Hurricane Zena.

Listeners and participants in this drill may have noticed a second activity taking place as a part of the SET.....the "search and rescue" of a "downed aircraft" using radio direction finding techniques. This portion of the SET turned out to be a real learning experience for those of us who participated as part of the "search and rescue" team. So much so that we thought a newsletter article was in order.

Saturday morning found team members KT1X, N1QPR, N1NOM and N1BHI on the 146.61/449.925 MMRA "network hub" discussing our strategy and readiness for the SET which was scheduled to begin at 10 AM. Bill, N1QPR, had volunteered to be the "downed aircraft" and we decided to conduct this portion of the SET with 146.565 MHz serving as the "distress" frequency. Andy, N1BHI, would remain at home and serve as coordinator of the "mission" using his laptop and mapping software, a role he plays frequently on our weekly "for fun" fox hunts. KT1X (me) and Eddie, N1NOM, would do duty as Doppler equipped mobiles, with KT1X hitting the road after providing an initial beam

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JANUARY MEMBERSHIP MEETING

WEDNESDAY, JAN 21, 1998 - 1930 HRS

CAMPION CENTER, WESTON MA

PROGRAM:

MICROTECHNOLOGY

Mark Horenstein, WA1GIO

HT Clinic

Raffle

Other Stuff

The Slygo Hill Shelter and Ham Ingenuity

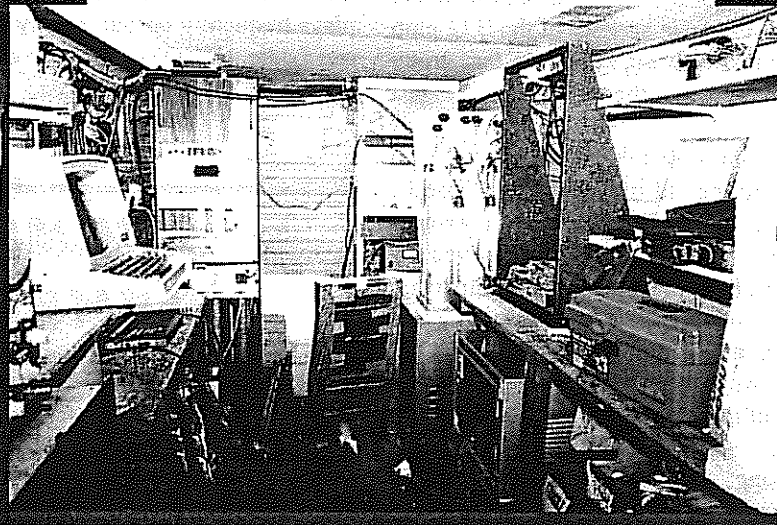
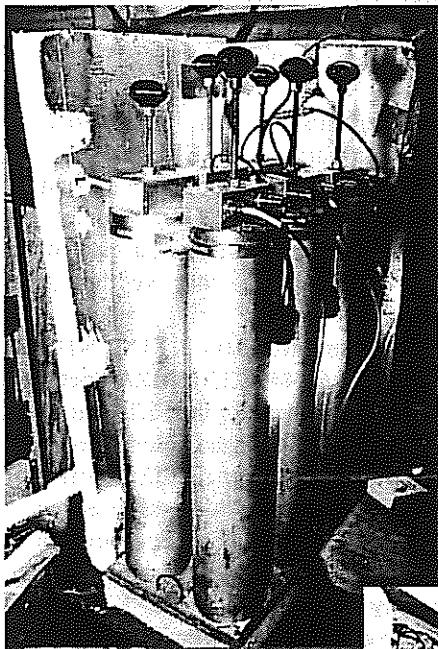
So, just what *do* you do when your duplexors, being used as a combiner for two digipeaters, have a problem with sensitivity to temperature change? Well, you *could* build a heated shelter, if you could afford it....or you could do what any inventive ham with a penchant for saving money would do. The picture to the left shows a set of cans that we had lying around for years that were pressed into service as a combiner for the 145.03 Netrom Node and the APRS repeater. They drift with temperature change, so Bill (N1QPR) et al made the next best thing to a heated shelter: a heated duplexor enclosure. You can see one half of the enclosure behind the cans. Hanging between the cans are two lights - see the enlarged section of the can picture just below. The two lights are a good heat source, and are controlled by a thermostat.

The enclosure itself is a testimony to the ingenuity of amateur radio operators and the inventors of duct tape and styrofoam. The picture to the right shows the enclosure after re-assembly (if you really want to call it re-assembly). Since the mating surfaces of the shelter were not carefully machined for airtight fit, and had no attaching facility engineered into them, duct tape performs both functions.

Below is a panoramic view of the interior of the Slygo shelter. At the lower left you can just see the corner of the 223.94 repeater enclosure. On the bench is a terminal attached to the 145.03 Netrom digi. In the rear left corner, against the wall is the 147.27 repeater, which the MMRA hosts in the Slygo shelter. It was recently re-racked and upgraded, making a good package.

To the right of 147.27 is the main node of our network, 449.925 - N1HBR/R. The featured cans partly block the view of 925, and on the bench in front of the cans is the APRS repeater.

The Slygo shelter will get some work when the weather improves in early spring - we plan to do some



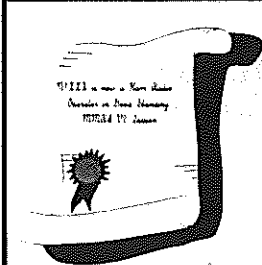
jacking and straightening; the shelter has sunk and sagged, making it difficult to open the doors.

The City of Marlboro plans to do a lot of beautification work on the hill, and we may have to put a disguise on the old milk truck body, making it look like a little house. In the next two months or so, we will hear from the city just what it plans to do, and how it will affect us.

In any case, there will be a couple of major work parties up on Slygo this spring, and we will be able to use all the help we can get. If we have to disguise the shelter, we'll be looking for people with some carpentry skills, and if anyone can help by donating materials, that would keep the cost down. But the key will be willing hands...so when you hear that the work is about to start, jump in and help out. We'll probably make a party out of it...with the partying happening after the work is done.

MMRA VE Sessions

2nd Saturday of Each Month
Marlboro Public Library, 9AM
Contact: Bill Wade, K1IJ
617-891-9079 Evenings 6 to 10 PM,
Weekends 8 AM to 10 PM.
Accredited - ARRL VE Program



Items of Interest From the ARRL Letter

E-MAIL ELMERS DEBUT IN DAYTON

Here's an idea that some other clubs might want to imitate. The Miami Valley FM Association last month announced its E-mail Elmer program. The system allows new or prospective hams in Dayton and Southwestern Ohio--or even experienced amateurs who are venturing into a new aspect of the hobby--to send an e-mail request for assistance. Volunteer on-line Elmers then can provide a response in the "Elmer" tradition of mentoring new or less-experienced hams.

"Today, many hams prepare for their license exams through classroom programs, and the individual Elmer's touch isn't as common as it once was," said MVFMA President Fred Peerenboom, KE8TQ, of Dayton. "The E-mail Elmer program is an attempt to restore this long tradition." Peerenboom said the club hopes the initial e-mail exchange be the start of an ongoing Elmer relationship in the best tradition of Amateur Radio."

Hams in the Dayton area or in Southwestern Ohio may use the Elmer Server simply by sending an e-mail message to elmer@febo.com and posing the ham radio question they'd like to have answered. Users will get a machine-generated confirmation, and, within a few days, they'll get a response from one or more of the volunteer Elmers.

For more information, or to volunteer as an E-mail Elmer, contact KE8TQ at 937-256-4355; e-mail ke8tq@febo.com.

Editor's Note: *Does this sound like a good idea for us? I kind of like it....we ought to look into this.*

SPUTNIK PS2 DEAD?

Reports from around the world appear to confirm that the Sputnik PS2 mini-satellite has stopped transmitting. The beacon signal from the working model of the original Sputnik 1 satellite was last monitored on December 29 or 30. The lithium battery-powered 200 mW transmitter had continued working for eight weeks after its launch by hand from the Russian Mir space station on November 3, transmitting a beep-beep tone on 145.82 MHz, and many hams around the globe had continued to track the satellite's progress. The frequency of the tone indicated the satellite's internal temperature. Recent reports from stations monitoring the Sputnik PS2 indicated its signals were getting weaker.

Students from the FR5KJ radio club at Jules Reydellet College in St Denis, Reunion Island, and at the Polytechnic Laboratory of Nalchik Kabardine in Russia cooperated in building the mini-Sputnik. The Russian students built the satellite body, while the French students fabricated the transmitter inside. Two working models of the Sputnik were assembled and transported to Mir, but only one was launched. The Sputnik PS2, also called RS-17, surpassed the life of its original namesake by several weeks. The little satellite was a one-third scale model of the original and had been estimated to remain in operation for approximately 40 days.

As of January 2, the satellite had not been officially declared dead, however.

FCC INVITES SUPPLEMENTAL COMMENTS IN EDAP TECHNOMED WAIVER REQUEST

The FCC has set Friday, January 9, as the deadline to file supplemental comments in the waiver petition filed in 1996 by EDAP Technomed Inc to operate a medical device at 1.296 GHz at emission limits above those allowed by the FCC's rules (see The ARRL Letter Update, June 21, 1996). Amateur Radio has a secondary allocation in the 1.24 to 1.30 GHz band. The Federal government has the primary allocation, for radiolocation, and uses the band mostly for high-power radar systems. EDAP wants a waiver of the radiated emission limits to permit sale and use of the device to treat benign prostatic hyperplasia (non-cancerous enlargement of the prostate gland). EDAP has told the Commission that its device, called a Prostatron, operates at 1.296 GHz because the wavelength is uniquely suited to the treatment process; however, it radiates energy 67 dB above the limit set by Section 18.305(b) of the FCC rules.

The ARRL, Urologix Inc, and the National Telecommunications and Information Administration (NTIA) all have raised objections to the EDAP petition. The NTIA cited concerns about potential interference to air traffic control systems. Hams also submitted informal comments by e-mail to the FCC's Office of Engineering and Technology (OET) after the formal comment period ended.

The FCC says EDAP has been trying to address the concerns of the opposing parties, and late last year, the company and the NTIA reached a conditional agreement. The OET now has invited comments regarding the recent NTIA and EDAP filings under the FCC's "permit-but-disclose" requirements of its ex parte rules. The ARRL plans to file supplemental comments in this proceeding.

Reply comments are due by January 26. A public file of documents in this matter is available for inspection and copying in the OET, Suite 480, 2000 M Street NW, Washington, DC 20554. For more information, contact Anthony Serafini, 202-418-2456.--FCC

HAMS HELP IN WAKE OF GUAM TYPHOON

Ham radio operators helped relay damage assessments and continue to keep open lines of communication between Guam and the Pacific islands of Saipan, Tinian, and Rota in the Northern Marianas in the wake of Typhoon Paka. The storm Tuesday caused heavy damage on Guam, but telephone service remains intact, according to Jim Kehler, KH2D, president of the Mariana Islands DX Association. Kehler says the islanders are taking the situation in stride for the most part. "Typhoons in this part of the Pacific are something that everyone knows about and has a respect for, since we have all seen the results previously."

While damage estimates are in the \$200 million range, no one was killed or seriously injured when the storm passed over Guam, "Everybody is just happy to be alive, and nobody is sitting on the curb crying cuz the house got flooded and the car got crushed," Kehler relates. "That's Guam." Kehler says there's a great sense of community on the island, with everyone pitching in to help others get their lives and homes back

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Items of Interest....From the ARRL Letter

(Continued from page 3)

together in the disaster's wake.

Kehler reports the storm wiped out commercial power and water as well as most of the trees on the island. He estimated that it could be "two or three months" before commercial power is fully restored on Guam.

Kehler said 7.085 MHz is being used for inter-island communication. He said that during the storm's approach, hams on Guam also used 7.085 while tracking its path. During the storm, Kehler's and five other MIDXA stations were operational on 40 meters. The others included WH0AAV on Saipan, KH0CE, on Tinian, and N4UQM/KH2, KH2JU, and K9AW/KH2 on Guam. Kehler said that his ham radio station was not damaged in the storm, but he reports conditions have not been favorable for reliable communication with the mainland with his modest setup. Several other hams on Guam were not as fortunate and suffered heavy wind and water damage from Typhoon Paka, he said.

Kehler said Paka marked the first storm where he was "really scared." The typhoon is said to have packed record-shattering winds in excess of 200 mph.

The only VHF repeater on Guam survived the storm, but Kehler says it's not being used for emergency communication at this point. Commercial radio stations were put off the air, however.

Kehler said the MIDXA was formed in November after Typhoon Keith struck the Northern Marianas. "One of the reasons was that Rota lost all commercial communications in that storm, and the ham community here was totally unprepared to help," he explained. MIDXA members continue to monitor 7.085, "at least those with a radio, antenna, and a house left," Kehler said, but with commercial power and water out of commission, "Guam is a mess."

In the storm's wake, Red Cross National Headquarters had activated Virginia ARES to coordinate damage assessment recovery information from ham radio sources in the Pacific--primarily Hawaii and Guam. Red Cross National Headquarters is located in Fairfax County, Virginia, and relies heavily on ARES support during disaster responses when normal lines of communication are not available. Information summaries and updates were posted on the Virginia ARES Web site, <http://www.aresva.org>. The Red Cross now has a contingent on Guam and has terminated the Virginia ARES activation "with thanks to everyone who participated in this response."--thanks to Jim Kehler, KH2D, and Don Mahan, KD4WGV and Frank Mackey, K4EC/Virginia ARES

HAM RADIO TO THE RESCUE--AGAIN!

Three Franklin Pierce College students may owe their lives to ham radio. The three found themselves stranded on New Hampshire's Mount Monadnock in late November after becoming disoriented and lost in the snow and darkness. Fortunately, one of the students was Michael Sensabaugh, KB2SSA, of New York. He radioed for help with his small

hand-held transceiver via the K1TQY repeater in Keene.

Repeater trustee Dawn Cummings, K1TQY, and Roberta Bennett, N1WTY, responded. Cummings took charge of communication. Bennett called in the alarm to Monadnock State Park Manager Michael Walsh. Then, she bundled her young son and her own H-T in the family car and drove to Walsh's office.

Throughout the next four hours, Bennett provided a radio link between the lost students and the search party via "Henry, the Keene Machine," as the K1TQY repeater is known. Walsh was thus aware of the students' current predicament and was able to instruct and encourage them accordingly. The students were found late that evening and brought to safety as bad weather continued to move in.--thanks to Richard Seifert, KB2FF

OHIO VOA ANTENNAS COME DOWN

Ham visitors to Ohio--perhaps on their way to the Dayton Hamvention--sometimes found it hard to keep their eyes on the highway when passing the Voice of America's Bethany Relay Station. The vast antenna farm off I-75 north of Cincinnati consisting of 14 rhombics and a huge Sterba curtain easily distracted most hams.

At one time among the most powerful shortwave stations in the world, the Bethany Relay Station was shut down a couple of years ago. Earlier this month, the towers supporting the majestic Sterba curtain and other wire arrays came crashing down--to make way for commercial and recreational development and a university campus on the 625-acre site. Among those on hand to watch the spectacle was Tom Rupp, W8TCR, a VOA engineer for 26 years who retired in 1993.

Work will continue to remove the other towers and structures. Most of the towers will be pulled from the ground with a crane. Forty towers, ranging from 90 to 150 feet tall, will be salvaged. Crews will finish clearing the towers by February.

A report in the Cincinnati Enquirer quoted ham radio

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Give the MMRA World Wide Web Home Page a try.... let us know what you think.... any ideas are welcome. We are looking into things like an MMRA list server. We now have our own domain name - mmra.org. The Web Page keeps getting better.....

WWW Address:

<http://www.mmra.org/~mmra/mmrainfo.html>

MMRA Information - Repeaters, Officers and Board Members

MMRA Repeaters:

Marlboro	146.61	N1BHI/R	FTL P	
Marlboro	449.925	N1HBR/R	FTL P PL	- 88.5 in and out
Quincy	146.67	K1ML/R	PTL P	
Quincy	224.40	N1KUG/R	FTL L PL	- 103.5 in, none out
Weston	146.82	K1AL/R	PTL P PL	- 146.2 out, none in
Weston	224.70	N1HBR/R	FTL L	
Hopkinton	223.94	N1BHI/R	FTL L PL	- 103.5 in and out
Stoneham	146.715	N1NVL/R	PTL P PL	- 146.2 out, none in.
Stoneham	446.725	N1NVK/R	PTL L PL	- 88.5 in, none out
Taunton	449.575	N1NVL/R	FTL L PL	- 88.5 in, none out
Marlboro	53.81	W1BRI/R	PTL L PL	- 71.9 in, none out

[FTL = Full Time Linked PTL = Part Time Linked]

[L = Patch available via link] P = Local Autopatch]

MMRA Officers:

President:	Andy Morrison, N1BHI	To Contact Officers
Vice President:	Clark Conti, N1NVK	or Board Members
Secretary:	David Croll, KT1X	
	Lynne Ausman, K1NLD	Call MMRA Voice
Treasurer:	Ian MacLennan, AF1R	Mail Line:
Clerk:	Ed Mulhern, N1NOM	
Directors:	Tom Qualtieri, WB1GMA	508 - 489 - 2282
	Al Kunian, K1AL	Toll Free from
	Chris Conti, N1NVL	508 and 617 Areas
	Bob Feltmate, W1ZJE	
Newsletter Editor:	Andy Morrison, N1BHI	MMRA E-Mail
		mmra@mmra.org

Important MMRA Club Information:

Membership Meetings: 3rd Wed of Sept, Nov, Jan, Mar, May at
Campion Center, Weston at 7:30 PM

Meeting Dates for 1997-98 Season: September 17, November 19,
January 21, March 18, & May 20.

Board Meetings: 3rd Wed of Oct, Dec, Feb, Apr. Meetings are open and members are welcome.

If a visiting member wants to be on the agenda, please contact Andy Morrison beforehand.

MMRA Voice Mailbox (508) 489-2282. -- This is a local call from any 508 exchange phone, and is a free call
from both 617 and 508 areas.

Newsletter Information

	September issue	November issue	January Issue	March Issue	May issue
Mailing Date	Sept 11, 1997	Nov 13, 1997	Jan 8, 1998	Mar 12, 1998	May 14, 1998
Submission Deadline	Sept 1, 1997	Oct 26, 1997	Dec 28, 1997	Feb 22, 1998	Apr 26, 1998

The MMRA is dedicated to Amateur Radio and the public service. The MMRA is a registered non-profit
Massachusetts corporation. Membership is open to all amateurs. Annual dues are \$25.00 individual, \$35.00
family.

Minuteman Articles

— Solicitation

If you have ever built anything, fixed something, or have an experience that you want to share, then you should submit an article to the MMRA Minuteman. Contact Andy Morrison, N1BHI, if you want to talk about it. We can scan artwork and schematics to make an article more interesting and useful. Give it a try!

Zena Hunt.....

(Continued from page 1)

heading from his home station.

Shortly after 10 AM, N1QPR checked in with SET net control N1QIR, announced that he would be transmitting at about 2-3 minute intervals on the "distress frequency", and invited stations to contribute signal reports and beam headings in an effort to aid the team in locating him. The game was afoot!

Stations checking into the net on the linked MMRA repeater system provided weather info and signal reports, with the lack or presence of signal mapping out a rough area surrounding the fox.. Within 15 minutes, KT1X had verified that the signal was coming from a broad bearing northeast from his Sudbury QTH. Larry, W1DYJ (Woburn), another regular contributor of beam headings during our frequent "for fun" fox hunts, weighed in with a westerly beam heading that N1BHI quickly plotted.

N1BHI determined that the data boxed the "downed aircraft" in an area running from the Sudbury Concord line, through part of Lincoln and Lexington, with the beam headings actually crossing in the vicinity of Rte. 4/225 and 2A, just West of Rte. 128/95. As additional stations checked in on the SET net with weather data, KT1X went mobile joining Eddie,

N1NOM, who was already deploying in the target area and was reporting "good signal" in the Rte. 2A area, near Hanscom AFB.

KT1X, while approaching the target area via Rte. 126, attempted to make contact with N1NOM on 446.000 MHz simplex to get additional information. Unfortunately the hilly terrain prevented mobile to mobile communications, hampering local coordination that in retrospect might have saved some time. Upon reaching the target area, KT1X verified the strong signal reported via the SET net and proceeded to acquire Doppler data. Although signals were now strong, the quality of the Doppler tone indicated severe multipath, probably owing to reflections from the numerous hills and ridges. By this point, about 40 minutes had elapsed and it was time for a new strategy.

N1NOM had already made the breakthrough. Pulling back from the immediate area, he began to get consistent bearings pointing toward Rte. 62 and Concord Center. Following his Doppler bearings, Eddie "localized" the signal in the vicinity of the southeast side of Great Meadows National Wildlife Refuge. Checking out streets off Rte. 62 systematically, he got very strong signal readings in the vicinity of Prescott Road and Minuteman Drive, detecting signal without an antenna on his HT. Still, he just couldn't find the "downed aircraft.!

By this time, KT1X, having been informed of the progress

(Continued on page 7)

Items of Interest.....

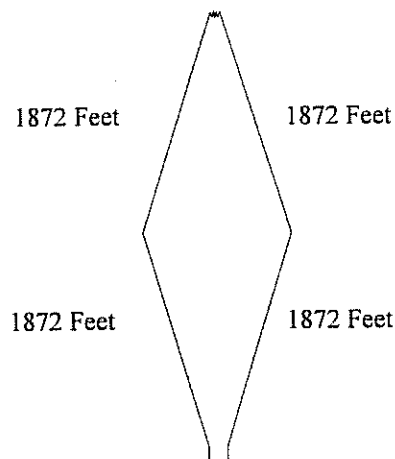
(Continued from page 4)

operator Joe Goforth, WB8NFJ, who lived less than a mile from the VOA site for two decades. "I used to talk to the engineers all the time," he told the paper, noting that VOA broadcasts sometimes interfered with his ham gear. "But I guess I'm a little disappointed to see it go," he added.

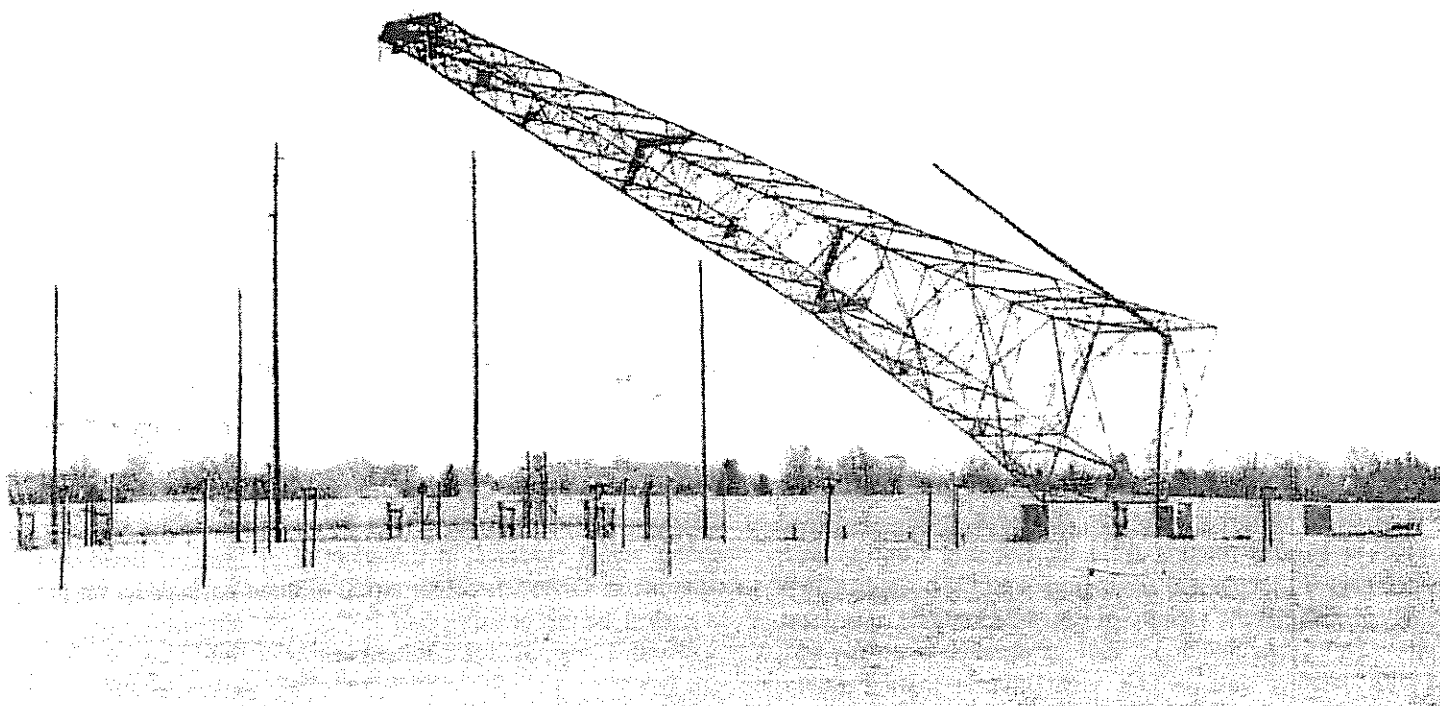
For a look at one of the Sterba curtain support towers coming down, see <http://www.palmtop.net/img/voa.jpg>. For more info on the Bethany Relay Station, visit the Jim Hawkins' (WA2WHV) Radio Room, <http://www.exit109.com/~jimh/voaohio.html>.--thanks to Mitch Hamm, N8XS, and Jim Hawkins, WA2WHV

Editor's Note: *For those of us who have been around the hobby long enough to have been involved with large wire HF antenna's, this is sort of a sad event. See the picture below... you can get an idea of the scale of the antenna's involved. To give you a better idea, a rhombic antenna is huge array, formed by wire suspended from the towers like the one coming down. Take a look at the diagram to the right. One of these will **not** fit in the average backyard! But if you want to point a beam of RF energy somewhere, and have nearly infinite front to back, this is the antenna you use:*

This is a non-resonant, terminated (600 Ohm resistance) Rhombic. Each straight section is a "leg"...and in this configuration, to make it an all band antenna, each leg must be at least 3 wavelengths long. The dimensions below are for one that will work from 1.5 MHz and up.



Wanna Build One?



Zena Hunt.....

(Continued from page 5)

via the network, had arrived in the area and decided to take Monument Street out of Concord Center. This road runs for several miles along the northwest side of Great Meadows. As NINOM was getting results which suggested that the "downed aircraft" might be inside or across the Great Meadows area, checking out the other side seemed to make sense. For the next 30 minutes, KT1X acquired Doppler readings and GPS data, and in conjunction with the plotting efforts of N1BHI, made an effort to systematically locate the "downed aircraft".

By this time NINOM had driven a complete loop around the area, going as far as Rte 225 in the Bedford area, only to arrive at the same conclusion as half an hour before.....the "downed plane" had to be inside or near Great Meadows! KT1X was still scouring dead-end roads on the northwest side of the Refuge and getting bearings, all of which pointed toward the southeast side where NINOM had strong signal, but could not find the "crash site".

Concluding that the NINOM data indicated the "aircraft" was definitely on the Rte. 62 side of Great Meadows, a conclusion supported by an additional beam headings from Steve, N1KML, and Frank, W1JDO, a frustrated but still determined KT1X drove over to the Rte. 62 area near the Concord/Bedford line. As was the case with NINOM, his initial data from this area verified that the "aircraft" was close, possibly on the edge of Great Meadows.

At this point, the strategy turned totally to "close in" tactics i.e., looking for strong signal without an antenna. Problem was, you could hear N1QPR with no antenna for several blocks on either side of where Eddie had first localized over an hour ago! Where to go? Doppler readings always seemed to point into the Refuge, but the lack of access roads and the local terrain precluded following a direct path. Nothing to do but to carefully comb the area...a maze of small interconnected suburban streets and open fields abutting the Concord Sewage Treatment Plant and the edge of Great Meadows.

NINOM finally located the "aircraft" at about 12:20 PM on the edge of Great Meadows, just as the bulk of the data seemed to indicate. He was shortly joined by local MMRA member Gary, KB1TF, who had come out to hunt with a Yagi mounted on his truck. Finally, at about 12:40 PM, yours truly also located the "downed aircraft".

N1QPR had "crash landed" his Chevy Blazer into the parking lot next to Great Meadows! He gleefully pointed out to members of the team that his position was in line with the longest Hanscom AFB runway! Owing to the fact that access to this parking area is via a dirt road which runs off of Monson Street, connecting as a rather inconspicuous opening in a wooden fence (all right there is a small wooden sign on the fence there!), NINOM had driven by several times without noticing an obvious hiding spot and the solution to our dilemma of getting into the Refuge!

What's to be learned? Why did it take so long? We typically locate foxes in our weekly hunts in about 45 minutes

to an hour! Would our activity have been any use in a real emergency? The answer is complex, and teaches several important lessons.

First the the lessons about "what worked". Thanks to the signal reports, initial bearings and plotting, we actually localized into the area in 30 to 40 minutes, including about 20 minutes of "drive time" to the area. In a real emergency we likely would have had more than three mobiles checking out the area from which the signals seemed to be coming. It's easier to hunt the "end game" by brute force with more than a handful of mobiles. Also, locals would likely have been involved....the very folks who have knowledge of roads that aren't always shown correctly on maps. Only one of my maps showed the dirt road at all, and several maps were out of date, indicating nonexistent roads traversing the area!

What was "wrong" and what would we change after doing this once? First, while the passing of signal data and bearings on the SET weather net was initially helpful, once the mobiles were in the field the communications would have been better conducted on a separate dedicated repeater. Second, once beam headings had been given and the mobiles were "local" with strong signals, it would have been better to spend more time systematically coordinating the mobiles via N1BHI than having him spend time communicating with home stations.

One might sometimes make a "lucky guess" from a home QTH with a detailed map of the area, but its not likely. Some of the information provided by home stations with maps appeared outdated, as a road through the Refuge was non-existent. Several detailed maps in the hands of the coordinator and more map reading by the mobiles would be better, especially when looking for access roads and taking bearings while moving in weekend traffic! Our experience shows that multiple detailed maps for everyone and a second person as a navigator in the mobiles are likely to be useful in real emergencies.

How about equipment? The main improvement I would like to make after the hunt is the ability to automatically send GPS data and bearings and to generate automatic records using a laptop. Manually reporting/entering bearings/positions is tedious and is time consuming. Curving roads don't help! If you don't have a lot of mobiles, you need a lot of bearings. Why not systematically acquire and save them all?

Would I hunt during an SET again? Sure, it was fun and instructional, and the initial localization went pretty well. But to really be effective, I'd look for extra mobile help, tighten-up communications, automate the recording of Doppler data, and have a seasoned navigator "on board" to read those detailed maps carefully!

Look for a story about a real Fox Hunt in the next issue of the Minuteman. Our team of fun loving hunters comprise our Interference Committee - and they found some interference for a South Shore repeater group.

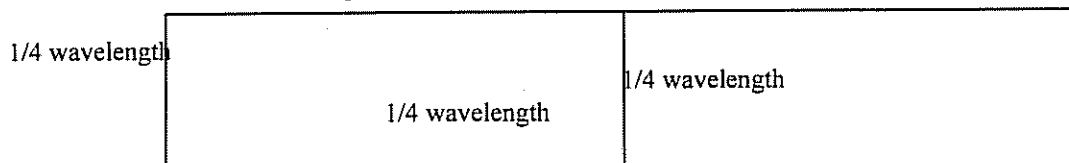
An Antenna for All Hams - HFeR or VHFer

Andy Morrison, N1BHI

Well, I just couldn't help myself. Seeing that picture of the towers in Dayton coming down makes me sad...and annoyed at the idea that the days of wire are coming to an end. So I decided to do a short construction article on my favorite antenna, the Bobtail Curtain.

The great thing about this antenna is that it offers a couple of key advantages: it's simple to construct, and it offers a lot of gain. If you build a dual Bobtail for 40 meters, you can blow the doors off the guys who have spent thousands of dollars for aluminum arrays for that band. A single Bobtail is essentially a 3 element phased array that has a dual cardioid pattern - that is, it is bi-directional. It's gain in each direction is close to that of a three element Yagi. Look at the picture below. Four pieces of wire: the horizontal, long piece is one **free space** wavelength long at the frequency of interest. You do not use length calculations that involve the effect of thickness to length ratios. The other three are 1/4 wavelength long each, calculated using the equations that take into account wire

One Wavelength at Frequency of Interest



thickness - 234 divided by the frequency in megahertz.

Erecting the antenna is easy if you have some trees and a big enough yard. A 40 meter Bobtail takes a lot of space - you need about 150 feet, as the wire needs to be 137 feet long at 7.15 MHz. But if you want to be a big gun on 20 meters, you only need half that. If you are a tech plus or novice and want to have good signal on 10 in two directions, this antenna needs only about 40 feet between suspension points. In the 40 meter version, you want about 50 feet of height. That puts the bottom ends of the verticals about 12 feet off the ground. For this type of array, higher is better. However, it will work well close to the ground. Use small weights to keep the vertical wires taut.

There are two ways to feed the antenna, one easy, one hard. If you feed the antenna at the bottom of the center vertical element, you need a fancy matching network, as it is voltage fed at that point. Consult the antenna handbook for the matching network design. So the recommended method is to feed the antenna at the top of the center vertical element, using coax. Attach the shield to the exact center of the horizontal wire and the center conductor to the top of the vertical element. Surprisingly, this gives under 2:1 vswr - with good low loss coax that works fine. You can use a tuner to get rid of the slight mismatch, and will have negligible signal loss from feedline attenuation. The feedline should approach the antenna as close to a 90 degree angle as is possible.

With *two* of these antennas, you can outperform a 5 element Yagi. If you hang the second one with the horizontal wire parallel to the first one, and feed it with phasing lines (90 degrees or 1/4 wave out of phase with the first array) you have a uni-directional array. It has in the order of 9 - 10 dB gain over a dipole. Its front-to-back ratio is 30 dB or better. If you get really clever, you can arrange switching that puts the 90 degree delay line between the RF source and either of the Bobtails - you can then switch the pattern. One of the hardest things to do is to work the western part of the U.S. or into the Pacific while the European broadcast stations have propagation to your location. Put up a dual Bobtail, orient the horizontal wires along a line whose bearing is north-northwest by south-southeast, and switch the pattern to point west-southwest. Those pesky broadcast stations all but disappear. And on top of that, you put a monster signal, at a low angle of radiation, into the Pacific all the way down to Australia. When you switch the array to point the beam at Europe, you get disbelief from the hams reading their S-meters.

Would you believe that this antenna will work at VHF? I built one for 2 meters just to experiment. Using aluminum tubing, welding rod and a wooden boom, I made one that could be rotated. The aluminum rod formed the horizontal elements - more correctly, the phasing line - that's what the top wire really is. It delivers RF to each of the vertical elements in phase, making them work together to give gain in two directions.

While I could not test the array on a good antenna range, it seemed to deliver performance better than a 5 element 2 meter Yagi. It exhibited fewer and less significant lobes than a Yagi, and had a very narrow beamwidth. While it is clumsier than a Yagi, it is easier to build *and tune correctly*. If you live in a place where antennas are not welcome, a Yagi looks a little too obvious. A VHF Dual Bobtail could double as a structure on which you hang out things out to dry. Or as a plant hanger. And while fooling the neighbors, you can have an array that will outperform a Yagi.

The Bobtail offers a rewarding antenna building experience to the beginning HFeR, especially on 10, 15 or 20 meters. You can have a pretty big signal for a small investment in time and money.

I'll do another antenna article this year - the one I have in mind is the ultimate in gain and front-to-back ratio. It can be built for VHF or UHF...on HF it is huge. But its performance is nearly unbelievable - how about a 5 degree half power beamwidth? See if you can guess which antenna it is....let me know via email or by radio.

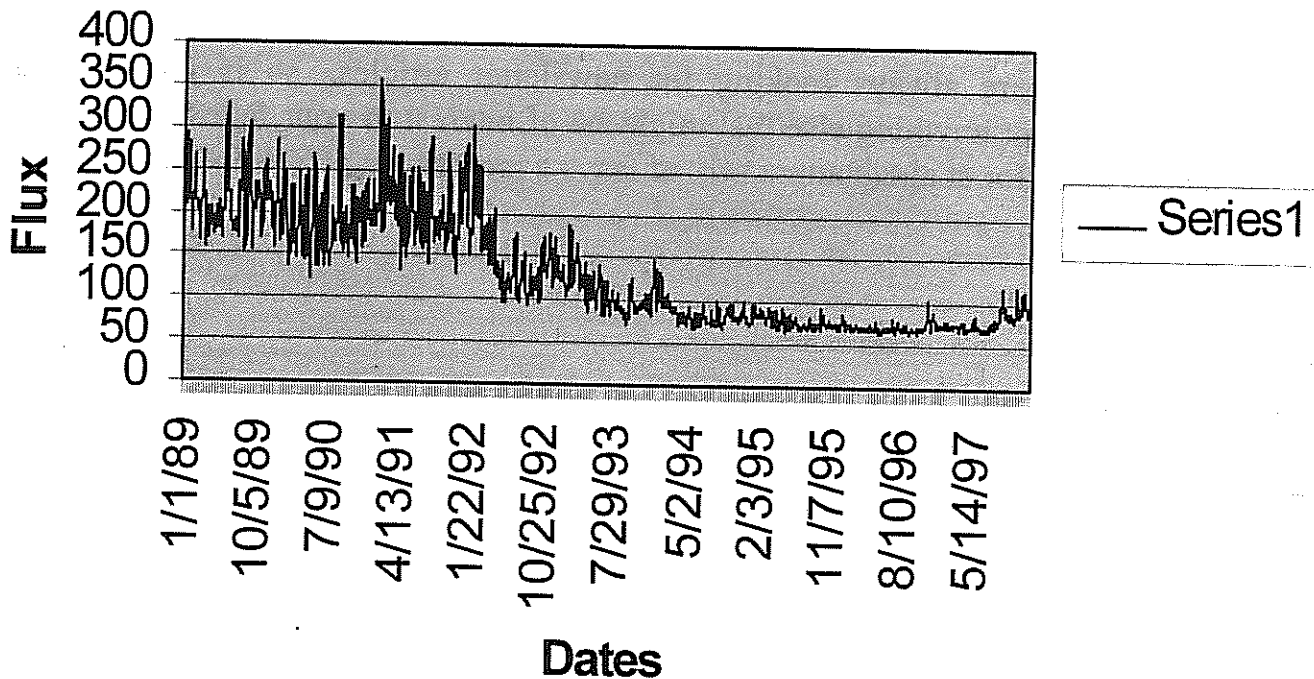
For the HFer's Among Us - Sunspots Beginning To Return

The new cycle is finally beginning! Thanks to Frank Morrison, KB1FZ, who has been downloading the "WA4TTK Solar Data Plot Version 2 Data File", containing long term solar flux data. The graph below tells the story.

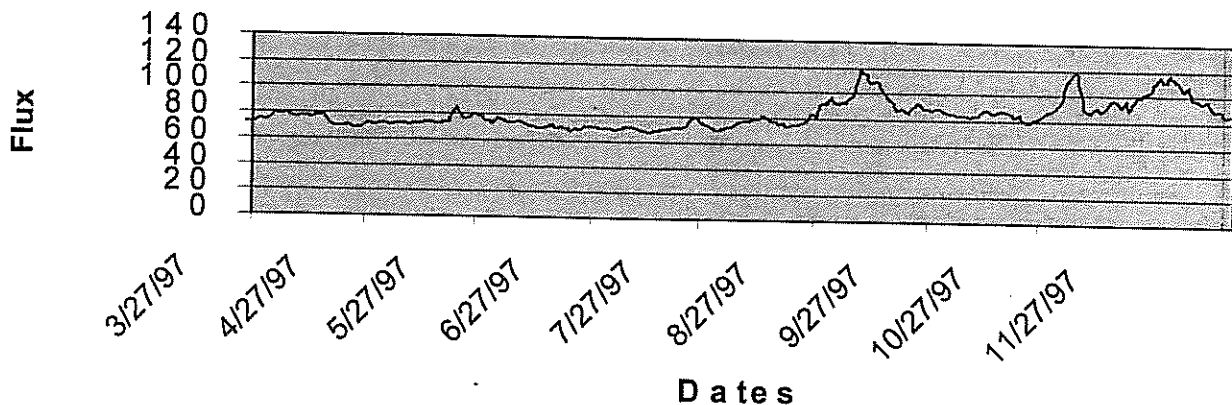
You can see the last cycle dying off, and going dormant during the period of 1993 to mid-1997. At the end of the series, you can see some jagged jumps, indicating a rising trend in the making.. The second chart shows just the last 9 months or so....it's easier to see the upswing happening. Those little upward disturbances at the end are sure evidence that the new cycle is starting. And further evidence is implicit in the fact that 15 and 10 meters have been opening up for longer paths recently.

So all you HFer's better start getting ready...antenna maintenance is best done during the lousy winter months. Especially when it is snowing, or even better, sleeting with a wind of 40 knots minimum.

Solar Flux



Last 9 Months of Flux





❖ The Minuteman ❖

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- **Solar Flux Trends**

Remember that we are always looking for newsletter articles....so if you have a good construction project, or anything else that might be of interest to your fellow hams, send it in. You can email the editor at alm@mmra.org, or leave a message at 508-489-2282.

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