The Minuteman

Volume 27 Issue 1 September 1997

President's Corner

Another new fiscal year...and our first meeting of that year is upon us. The program will be interesting; it will be a compendium of information and experience gained by a number of our members about Global Positioning Systems.

Also at the meeting we will be voting on the budget for this year; a summary of last year's budget and this year's forecast are on page 8. Look it over before coming to the meeting. The major expenditure planned for the year is to upgrade the antennas at Stoneham. We plan to procure a dual-band version of the PD-220's that have been working so well at Weston and Quincy. The existing antenna's are just not industrial strength; and since the receiver has been upgraded to a GE there on 2 meters, it makes sense to give both systems the best antennas we can afford.

Our compliments and thanks go to Walter Ching, N1HBR; he did a lot of work preparing the controller macros for the area code change. We were kidding him about the legislature's attempt to block the changes after he had done all that work...but common sense prevailed, and the Acting Governor stopped that nonsense.

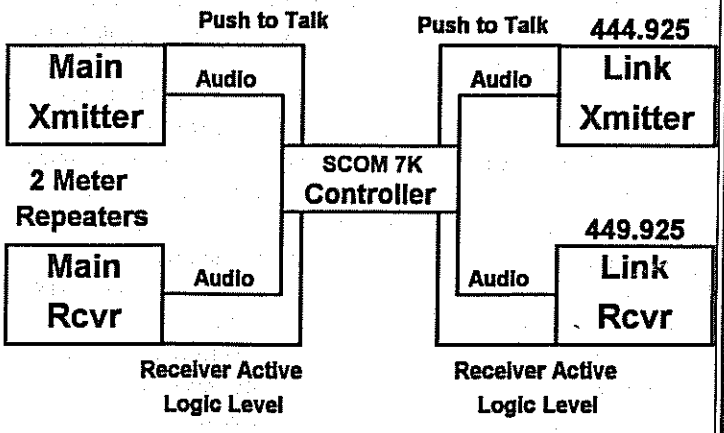
So I'll look forward to seeing you at the first meeting, and look forward to another good year for the MMRA.

How Linking Works

By A. Morrison, N1BHI

We've gotten a lot of questions about how the linking systems work since installing the SCOM controllers. So here's a description of how each of the linked repeaters and its linking equipment hang together.....

Linking Interconnections



Take a look at the diagram above....in the center is the SCOM controller - the heart of the system. It's fully programmable to

2 Meter RF Test Generator

A Construction Article
by Clark Conti, N1NVK

The original idea for this project came from Brian W1BRI who showed me units he built for testing scanners and receivers. The device is simply a crystal oscillator that generates a small amount of RF with harmonics in the band you wish to test. Notice I do not use the word "TRANSMIT." That is because the device does not have any power to speak of, it is weak by design yet it has some rather interesting uses. By being weak it can be used as a baseline signal for checking the sensitivity of a receiver, and since it is very stable, it can be used for checking the frequency. However I use it as an aid for fox hunting (SURPRISE!). This little beauty has just enough output to be detectable across a large empty parking lot for calibrating and testing various direction finding devices. It should be noted that by keeping the output low we are trying to comply with FCC part 15 rules, which say that you can't interfere with anybody and you have to be able to tolerate someone stepping on your signal.

Construction is very simple. The crystal oscillator is self contained with a TTL or CMOS gate to give it sharp rise and fall times, and to run directly off just about any power source from 3V to 12V. I chose a standard 9V battery with a switch. The output is coupled to an antenna through a .04 uf capacitor. Signal will be generated on each harmonic of the rated frequency with decreasing amplitude for each successive one. It helps to write down the frequencies, or at least the base and the most interesting one. The one shown here has a base of 16.257 MHz and has a

SEPTEMBER MEMBERSHIP MEETING

WEDNESDAY, SEPT 17, 1997 - 1930 HRS
CAMPION CENTER, WESTON MA
PROGRAM:

ALL ABOUT GPS
HT Clinic
Budget
Raffle
Other Stuff

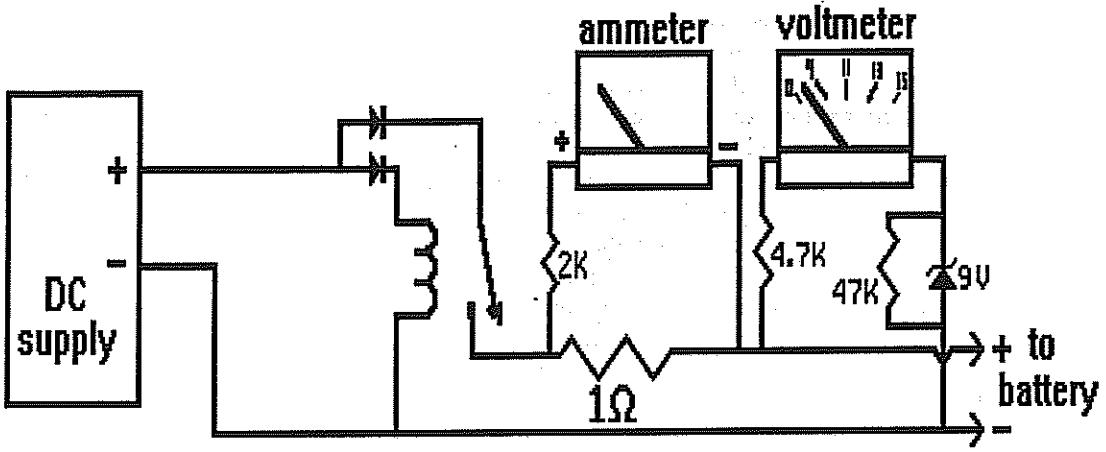
2 Meter RF Test Generator

Continued....

(Continued from page 1)

9th harmonic at 146.315 MHz, which is in a 2m simplex range.

I have made some measurements from my shack of signal strength with the device in my mail box, which is about 200 ft away. Measured values should be of approximate signal strength to read near the middle of the S-meter. If anything should change in my antenna, feedline or rig I can isolate the trouble by swapping antennas or rigs and comparing to known standards. I can also use the source for testing new antennas - checking to see where and just how big that first lobe really is.



Eric KA1EEC is planing to place some in model rockets as a tracking device - rockets are easy to lose sight of, but with a Handi-Finder you should be able to track it down. Total cost of the source and Handi-Finder is less than replacing two or three good model rockets.

Crystal oscillators of this type are available from many component suppliers. I got the one in this article for under $20 from the Digi-key catalog.

linking....

(Continued from page 1)

assume whatever personality we want; in another article we'll give you a description of how the programming works. But the main component in the controller that allows us to run linked systems is the "multipoint switch" - under program control it can direct any audio source to any audio destination. The controller is designed to control two receivers and two transmitters, and through the multipoint switch can interconnect them so that receive audio on either receiver can be repeated by **both** transmitters.

All we need to do is to hook up each transmitter's Push To Talk (PTT) and audio inputs to the controller at the contact points designated for Transmitter One and Two. Receiver One and Two audio outputs and Receiver Active Logic Lines (often referred to as COS or COR) are connected to the appropriate contact points.

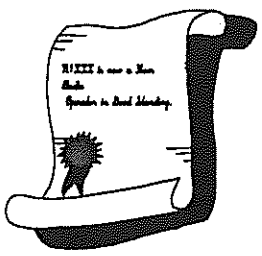
In programming the controller we instruct it to connect the Receiver One **and** Two sources to the Transmitters so that when Receiver One is active, both will transmit and repeat the audio from Receiver One. When Receiver Two is active, Transmitter One is repeating and Transmitter Two is down. To control the links we establish commands that enable or disable the paths between the receivers and transmitters. It is even possible to make Receiver One go to Transmitter Two only, and Receiver Two to Transmitter One only.

As described in an earlier article, the link between repeaters is established through the Marlboro 440 machine - as you can see above, Transmitter Two transmits on the Input frequency - 444.925 and Receiver Two listens to 449.925, the output of the Marlboro 440 repeater. So, when in a linked state, if Receiver One goes active, both the 2 meter transmitter and the 440 transmitter are on - and Marlboro 440 hears that, repeating whatever is being received by Receiver One.

At another 2 meter site, Receiver Two is listening to the output of Marlboro 440....if it is in a linked state, Receiver Two going active is sensed by the controller, which turns on Transmitter One.

The next diagram shows how we link two repeaters at one site

(Continued on page 5)



MMRA VE Sessions

2nd Saturday of Each Month
Marlboro Public Library, 9AM
Contact: Bill Wade, K1IJZ
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

Mir Ham Operations Qsy To 70 cm

Starting on or about Saturday, September 6, and continuing no later than September 29, ham radio voice and packet operations aboard the Russian Mir spacecraft will shift from 2 meters to 70 cm. An "experimental" worldwide FM simplex frequency of 437.650 MHz will temporarily replace the current 2-meter operating frequencies. Operations will return to 2 meters after the experiment ends. In the meantime, the shift could make it a bit more difficult to work Mir. For starters, power requirements will be higher than on 2 meters -- 25 W ERP or greater -- although contacts using an H-T are not out of the question. Also, some transceivers do not cover the satellite subband (435 to 438 MHz).

The Mir International Amateur Radio EXperiment (MIREX) is conducting the 70 cm test based on suggestions from several Amateur Radio satellite groups who are interested in the feasibility of operating Mir and the International Space Station on 70 cm. MIREX hopes the experiment will determine whether the 70-cm frequency receives interference from the existing commercial VHF equipment on Mir and whether 70-cm operation will interfere with onboard equipment.

More important for simple ground stations, however, is whether they'll be able to compensate for 70-cm Doppler shift on voice or packet. MIREX President Dave Larsen, N6CO, concedes that Doppler will be the biggest challenge for earthbound hams trying to work Mir on 70 cm. The Doppler on 70 cm is plus or minus 10 kHz. Most radios include 5-kHz tuning steps, and to work Mir on voice you will need to get within 3 kHz of the Mir receiver frequency. To work Mir on packet, the frequency error must be less than 2 kHz.

Miles Mann, WF1F, of MIREX reports he talked to Mike Foale, KB5UAC, aboard Mir on 70 cm on Thursday, September 4. Mann was mobile at the time, running 35 W. He reports very good signal quality during the 10-minute pass, which was at close to 60 degrees. Mann said he compensated for Doppler by programming odd-split channels in advance. He reminds users that both the transmit and receive frequencies must change, if you program channels in advance.

Larsen said this week that if the experiment does not work out, "it will be cut short." He said he hopes a filter that could be sent to Mir as early as October will minimize desensing of the 2-meter transceiver by Mir's commercial equipment on 143 MHz.

The Mir Personal Message System (PMS) currently consists of a Paccom Handi packet terminal node controller (TNC) connected to a Kenwood TM-733 2m/70cm transceiver. The antenna is an externally-mounted dual-band antenna, similar to a mobile antenna.

To comment on the experiment or for more information, contact Dave Larsen, N6CO, doc@volcano.net or Miles Mann, WF1F, Miles_Mann@Pictel.com.

Phase 3d Progress Continues

Despite scheduling setbacks, an international team of Phase 3D project workers continues final mechanical and electronic integration efforts on the satellite. Teams from Germany, Belgium, Slovenia, Hungary, Japan and the Czech Republic joined their American counterparts August 18 at the Phase 3D Integration Laboratory in Orlando, Florida in an all-out marathon to prepare the satellite as quickly as possible for a safe and successful launch.

"We are happy to join our American partners in this effort," said AMSAT-DL (Germany) Vice President Werner Haas, DJ5KQ. "The cooperation has, once again been excellent between our two groups."

Even before the arrival of the European contingent, workers at the Integration Lab were racing to make needed structural modifications to the satellite. The modifications became a requirement once it became known that Phase 3D would, during its planned Ariane 502 launch, most likely would encounter greater-than-anticipated environmental loads.

AMSAT-NA Executive Vice President Keith Baker, KB1SF, reports from Orlando that these significant mechanical upgrade efforts are proceeding. "The folks here at the Lab have been burning the midnight oil over the past several weeks to make these structural changes on a work schedule where 16 to 18 hour work days have been the norm, rather than the exception", Keith said. He went on the note that, "These people have done an absolutely superb job under some extremely difficult circumstances. We all owe them a tremendous debt of gratitude for their outstanding work."

Over the past week, these round-the-clock efforts continued with the combined team's current activities installing and checking out a significant number of the remaining electronic and mechanical pieces into the satellite. The effort included installation and checkout of the spacecraft's momentum wheels, the RUDAK digital experiment, the 2.4 GHz and 24 GHz transmitters as well as a number of other transmitters, receivers and other equipment. In some cases, the team needed to reinstall equipment that had to be removed to accommodate the structural modifications. --AMSAT News Service

Fcc Levies Fines for Unlicensed Operations

The FCC has fined Robert J. Powers, KB7TQA, of Puyallup, Washington, $1600 for operating on an unlicensed frequency. The action by the Compliance and Information Bureau was adopted by the Commission August 19. The fine stemmed from a violation that occurred a few months before Powers got his Technician ticket in April of 1993.

According to the FCC order, FCC agents from the Seattle Field Office discovered Powers on January 26, 1993, operating a radio station on 27.455 MHz "without authorization from the Commission." He was cited for violating Section 301 of the Communications Act. Agents used direction-finding equipment to trace the signal to Powers residence, and the FCC reports that Powers admitted to operating on the unlicensed frequency. Powers initially was fined $2000. The FCC subsequently reduced

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Items of Interest....From the ARRL Letter

(Continued from page 3)

the forfeiture to $1600. Powers was ordered to pay the fine by September 22, 1997.

The FCC also cited Victor Pessaro of Melbourne, Florida, for CB radio service violations that occurred in early 1994. Following up on interference complaints, FCC agents tracked down Pessaro as he was operating on frequencies other than those authorized by FCC rules. In addition, Pessaro refused the FCC agents request to inspect his station. Consequently, the Vero Beach Field Office issued a Notice of Apparent Liability to Pessaro for $5750 for operating over the regulated power limits in the CB radio service and for failing to allow an inspection. The forfeiture was later reduced to $750, and the FCC upheld the fine in an order released August 22. Pessaro has until September 22, 1997, to pay his fine. --FCC

Beach Ball Bunny

In a strange twist on deliberate QRM, an Indiana ham radio fox hunter last month discovered a transmitter hidden inside a beach ball floating in the Elkhart River. The transmitter was on the frequency of a local repeater. Hours before making the find on August 11, Pete Ostapchuk, N9SFX, of Osceola, Indiana, had won first prize in a fox hunting contest involving fellow hams, according to a report August 12 in The Elkhart Truth newspaper.

The paper said local authorities were investigating the incident, the latest in a string of occurrences where devices were deployed to jam ham radio frequencies in the area. Another beach ball containing a transmitter had been found earlier in the same week. Four disruptive transmitters were found during February and March.

Ostapchuk heads the interference committee of the Elkhart County Radio Association. He told the paper that he'd found several of the devices himself using DF equipment. --thanks to Dan Caesar, K9EUV

Solar Update: Things Are Definitely Looking Up

Solar oracle Tad Cook, K7VVV, reports from Seattle, Washington: Solar activity continues another week of good conditions with heightened sunspot numbers and solar flux. There are a number of good indicators, and one is that the average solar flux for the previous 90 days rose two points this week to 75, while the solar flux on every day this week was high above this average.

Solar flux above the moving average indicates a positive trend, and this has been the case for a month now. The last day that the solar flux was below the 90-day average was back on August 4, so this is a good indication that cycle 23 may finally be under way.

Along with the increased solar activity came geomagnetic instability caused by coronal mass ejections. The planetary A index has been 19 for the past two days, and was also in the teens at the end of August. Look for possible instability again around September 24 and 25.

Based on the previous solar rotation, solar flux may dip below 80 after September 10, then above 80 ten days later, and above 90 after September 25. Over Friday, Saturday and Sunday this week it is expected to be around 93, 90 and then 85.

An August 28 Reuters wire service report detailed some findings from the Michelson Doppler Imager, which is aboard the Solar and Heliospheric Observatory, watching the Sun from almost one million miles from Earth. The article mentioned complex patterns of currents below the Sun's surface that produce sunspots when they contact plasma. These streams can rub against each other, and the opposing forces shoot out material in the form of solar flares.

CIA On The Air

To commemorate the 50th anniversary of the US Central Intelligence Agency, special event station NN50CIA will be active through September from CIA premises in Northern Virginia. Suggested frequencies are 3550, 7050, 14050, and 21050 kHz on CW; and 3850, 7250, 14250 and 21350 kHz on SSB. QSL via KB4EFP, and include an SASE.

An Anecdote....from Bill Northup, N1QPR

A number of people that I hunt with wanted me to write up this little story about the first time that I went hunting for the clubs (then) new fox box. The fox box is a transmitter, voice recorder, timer, and battery in an ammo box that has a real nice paint job for anyone wanting to hide in a jungle. Well the paint job also makes it real nice to hide almost anywhere.

For gear at the time I had a couple of HT's (HTX202 & HTX404) for 2 meters and 440. I also had yagi's for both bands and a handi-finder. I had been hunting for a while so I was not totally green, but I was still in the learning curve.

I had been hunting alone and after what seemed like days, but was actually about 3 hours I started getting a signal on my HT without an antenna near a local grocery store. Just about the time I was finding out that the signal was full scale behind the store without an antenna, when another hunter (Dave)

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	KA1HKP/R	PTL	P	
Quincy	224.40	N1KUG/R	FTL	L	PL - 103.5 in, none out
Weston	146.82	KA1AL/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	W1BHI/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 or Board Members
Vice President:	Clark Conti, N1NVK	
Secretary:	David Croll, KT1X	
	Lynne Ausman, KA1NLD	Call MMRA Voice Mail Line:
Treasurer:	Ian MacLennon, AF1R	
Clerk:	Ed Mulhern, N1NOM	
Directors:	Tom Qualtieri, WB1GMA	508 - 489 - 2282
	Al Kunian, KA1AL	Toll Free from
	Chris Conti, N1NVL	508 and 617 Areas
	Bob Feltmate, WA1ZJE	
Newsletter Editor:	Andy Morrison, N1BHI	MMRA E-Mail mmra@mmra.org

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!

Important MMRA Club Information:

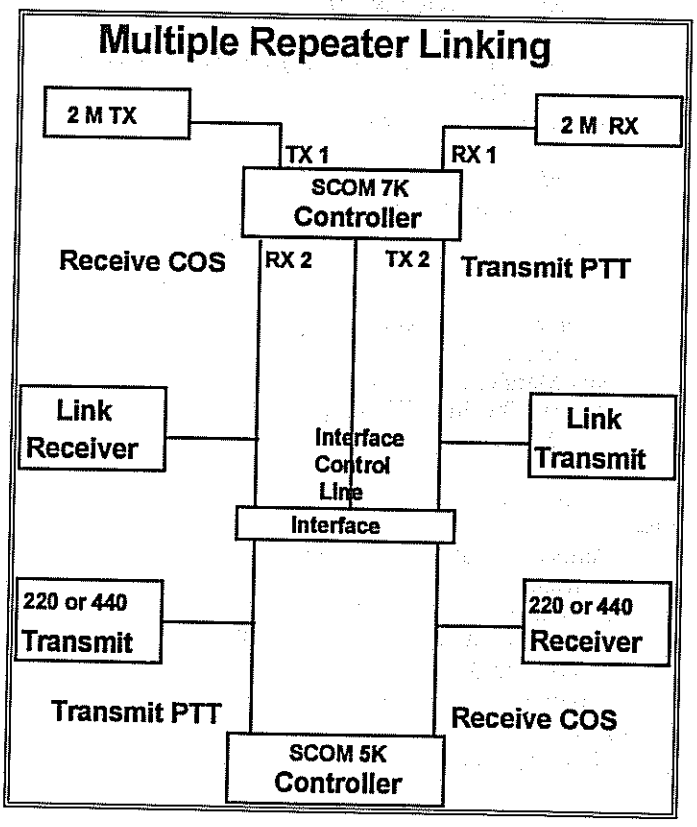
Membership Meetings: 3rd Wed of Sept, Nov, Jan, Mar, May at Campion Center, Weston at 7:30 PM

Board Meetings: Meeting Dates for 1996-97 Season: September 17, November 19, January 21, March 18, & May 20.
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, 1996	Nov 13, 1996	Jan 8, 1997	Mar 12, 1997	May 14, 1997
Submission Deadline	Sept 1, 1996	Oct 26, 1996	Dec 28, 1996	Feb 22, 1997	Apr 26, 1997

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.



into the system. This is the case at Weston, Stoneham and Quincy.

As you can see, this diagram is somewhat more complex...in effect is happening is that the second repeater's controller is cross connected with main controller. The secondary repeater controller TX-PTT is connected to the 7K RX2 (link receiver) COR input. For the sake of simplicity, the diagram uses one line to represent both audio and control lines - so secondary repeater controller transmit audio is summed with the link receiver audio. The summing happens in the interface box shown between the secondary repeater controller lines and the link transmitter and receiver.

The interface box has relays that make or break the control and audio connections between the secondary repeater and the TX2/RX2 contacts on the 7K. When the controller has been given the command that activates the secondary repeater link relays in the interface, this is how it all works.....

If you transmit on the input to the main repeater, both TX1 and TX2 (main and link) are turned on. Since the PTT line for TX2 is hooked up to secondary receive COS, the secondary repeater thinks its receiver is active....and since the audio from link TX2 is coupled in, the secondary controller activates its transmitter, which also repeats what is coming in on the main receiver.

(Continued on page 7)

HAMFEST and CONVENTION CALENDAR

1997 - 1998 Conventions & Hamfests

* = Conventions
+ = ARRL Hamfest
x = Non-ARRL Hamfest
** = Convention Pending EC Action
# = Holiday

1997

September 13
+ Saratoga County RACES, Ballston Spa, NY
Darlene Lake, N2XQG
84 Wilton Mobil Park, Saratoga Springs, NY 12866
518-587-2385
E-mail: lake@capital.net

September 14
+ South Eastern Massachusetts ARA, South Dartmouth, MA
William M. Miller, Jr., K1IBR
49 Old Westport Rd., North Dartmouth, MA 02747
508-996-2969

September 14
+ Delaware Valley Radio Assn., Trenton, NJ
Darryl Foyuth, N2JVP
DVRA, PO Box 7024, West Trenton, NJ 08628
609-882-2240

September 14
+ Westchester Emergency Communications Assn., Yonkers, NY
Thomas Raffaelli, WB2NHC
544 Manhattan Ave., Thornwood, NY 10594
WECA info-line: 914-741-6606

September 20
x Bagley ARC, Lincoln, ME
Max Soucia, N1KGS
PO Box 259, Howland, ME 04448
207-732-3263
E-mail: msoucia@telplus.net

September 20
+ South Jersey Radio Assn., Mt. Holly, NJ
Ed Baud, N2YAJ
214 Edward Ave., Hamilton, NJ 08610
609-888-0467
E-mail: ecb1@ix.netcom.com

September 20
* Western New York Section Convention, Hamburg, NY
Harold Smith, K2HC
300 White Spruce Blvd., Rochester, NY 14623
716-424-7184
E-mail: rochfst@frontiernet.net
http://www.buffalohamfest.org

September 20
x Central Vermont ARC, Randolph, VT
Barry Driscoll, KE1BV
RR 1, Box 3165, Barre, VT 05641
802-479-1408
E-mail: driscoll@planning.aot.state.vt.us

September 21
+ Candlewood ARA, Newtown, CT
Jacqueline Ritterbusch, N1SLE
11 Maple Row, Bethel, CT 06801-1006
203-790-7041
E-mail: jacquiesle@aol.com

September 21
x MIT RS & Harvard Wireless Club, Cambridge, MA
Steve Finberg, W1GSL
PO Box 397082, MIT Branch, Cambridge, MA 02139
Nick Altenbernd, KA1MQX, 617-253-3776

September 27
+ ARA of the Southern Tier, Horseheads, NY
David Lewis, WA2HTL
465 County Rt. 13, Van Etten, NY 14889
607-589-7495

September 28
+ Framingham ARA, Framingham, MA
Bev Lees, N1LOO
PO Box 3005, Framingham, MA 01705
508-626-2012

September 28
+ Metro 70cm Network, Yonkers, NY
Otto Supliski, WB2SLQ
53 Hayward St., Yonkers, NY 10704
914-969-1053

October 3-4
x HOSSTRADERS, Rochester, NH
Joe Demaso, K1RQG
HC 78, Box 56, Central St., Bucksport, ME 04416
207-469-3492
E-mail: k1rqg@aol.com

October 4
+ Bergen ARA, Teaneck, NJ
Jim Joyce, K2ZO
286 Ridgewood Blvd., Washington Twp., NJ 07675
201-664-6725
E-mail: jjjoyce@cybernex.net

October 5
+ Hall of Science ARC, Queens, NY
Arnie Schiffman, WB2YXB
81-22 250th St., Bellerose, NY 11426
718-343-0172

October 5
+ Washington Amateur Communications, Washington, PA
Patty Marshall, N3XAR
53 East Wheeling, Washington, PA 15301
412-225-4060
E-mail: n3vbu@sgi.net
http://www.wpol.com/wacom

October 12
* Connecticut State Convention (Nutmeg Hamfest), Durham, CT
Bill Wawrzeniak, W1KKF
5 Shire Dr., Wallingford, CT 06492
203-269-8252
E-mail: sbicycle@connix.com

October 12
* New England DXCC Convention, Chelmsford, MA

Mel Cole, WZ1Q
PO Box 8, Prides Crossing, MA 01965
508-927-1953
E-mail: mel@shore.net

October 12
* New Jersey State Convention
(Shore Area Hamfest), Lincroft, NJ
Al Jackson, NK2O
PO Box 635, Eatontown, NJ 07724
732-922-8121

October 12
+ Long Island Mobile ARC, Bethpage, NY
Rich Seltzer, N2WJL
PO Box 370, Malverne, NY 11565
516-481-8263
E-mail: n2wjl@juno.com
http://www.aol.com/RaySk/LIMARC1.html

October 19
x MIT RS & Harvard Wireless Club, Cambridge, MA
Steve Finberg, W1GSL
PO Box 397082, MIT Branch, Cambridge, MA 02139
Nick Altenbernd, KA1MQX, 617-253-3776

November 2
+ Mt. Beacon ARC, Poughkeepsie, NY
Ken Akasofu, KL7JCQ
316 Titusville Rd., Apt. 4, Poughkeepsie, NY 12603-2944
914-485-9617

November 15
x Mayflower ARC, Plymouth, MA
Jim Ford, NM1F
194 Rocky Hill Rd., Plymouth, MA 02360
508-747-2224

November 22
x Waltham ARA & 1200 Radio Club, Newtonville, MA
Eliot Mayer, W1MJ
508-664-0773

Linking....

(Continued from page 5)

If you transmit on the input of a linked repeater, or on the input of 449.925, link receiver COR goes active. The 7K sees that go high and turns on the main transmitter. Since link receive COR is tied to secondary transmitter PTT, that transmitter turns on and repeats what is coming in on the link receiver. The 5K controller is not involved - the PTT signal is actually the COR signal from the link receiver.

If you transmit on the input of the secondary repeater, its receive COR goes high. The 5K sees receiver activity and turns on the secondary transmitter. Since secondary transmitter PTT is tied in parallel with the link receiver to the 7K RX2 COR input, it turns on both the primary transmitter (TX1) and the link transmitter (TX2).

The main controller, the 7K, can establish the following link states:

Primary Linked, secondary unlinked
Secondary linked, primary unlinked
Both primary and secondary linked
Nothing linked.

The commands to do all this have been given to users in renewal code lists. In addition, we now have automatic linking that is done under program control for nets. The 7K at Slygo, at predetermined times, can bring up all the links.

So that's how it all works. If you have any questions about all this, just check in to the Tuesday night Information Net, or grab one of us at a meeting.

*(Continued from page 4).....***Anecdote.....**

called me to see how I was doing. Dave had hunted and found the box a day earlier. While Dave and I were talking another hunter (who we will call SAM but is not his real name) joined in telling me he and good signal a couple of miles away. His signals were not as strong as the ones I had so he decided that it would be better to come and hunt with me.

We there was a narrow road behind the store along this big brick building. Then there was woods for about 1/8 of a mile and a steep bank to some rail road tracks. Well to keep the story short we were getting all kinds of reflection from the building and the bank and just kept going in circles. While doing this SAM decided that he wanted to try body fading and it just wouldn't work for him. After numerous tries he kept saying that it wasn't working - SO I told him that the problem must be that he didn't have enough body and that he needed something to block the signal better and that he should go into the store and buy some aluminum foil and wrap himself in it. So SAM goes off into the store and I can get back to hunting. Well be had been there a long time now and it was getting dark. About 20 minutes later SAM is back and has himself wrapped in the aluminum foil and wanders back into the woods doing body fades trying to find the box. By now it is dark enough that we both need flashlights to see.

The store manager decides to take a break and go out back to have a smoke. What does he see but a couple of guys wandering around the back of his store and in the woods with flashlights. That is strange enough...but one of the guys is wrapped in aluminum foil. He calls the local police. I ended up having a rather LONG talk with the officer that showed up telling him how we were there looking for a hidden transmitter (I was told that there were no FOX in the area when I first said that we were fox hunting). Well if you think it is hard to explain what hidden transmitter hunting is, and that you are not someone out with evil intent - you should try it when the guy that you are with is wrapped in aluminum foil (and doesn't know enough to unwrap himself).

Well I never did find the box that time because there was no way that I was going to go back the next day. I wonder if SAM still has that box of aluminum foil in his car ?

That was the first time that I got a chance to talk to the local police about our fox hunting, but not the last. I have gotten much better at it, but I still won't hunt with any hunter that display strange habits - they are to hard to explain.

Editork's note: We have a number of this type of anecdotes; we'll publish them fron time to time.

Income:	1996 Budget	1996 Actual	1996 Variance	1997 Budget
Dues	7850.00	6783.75	(1066.25)	7850.00
Misc.	0.00	304.50	304.50	
Total	7850.00	7088.25	(761.75)	7850.00

MMRA 1996 Budget

This budget sheet shows 1996 Budget versus Actual. The 1997 Budget will be voted on at the September 19 Meeting.

All Expenses:	Budget	Actual			
Administration	4350.00	3434.86	915.14	4350.00	
N1BHI-146.61	600.00	565.10	34.90	600.00	*Normal Expenses*
KA1HKP-146.67	500.00	329.16	170.84	500.00	*Normal Expenses*
N1NVL-146.715	500.00	326.15	173.85	750.00	*New Antenna Included*
KA1AL-146.82	500.00	290.00	210.00	500.00	*Normal Expenses*
N1BHI-223.94	200.00	0.00	200.00	50.00	*Normal Expenses*
N1KUG-224.40	50.00	0.00	50.00	50.00	*Normal Expenses*
N1HBR-224.70	50.00	0.00	50.00	50.00	*Normal Expenses*
N1NVK-446.725	50.00	0.00	50.00	500.00	*New Antenna Included*
N1NVL-449.575	50.00	0.00	50.00	50.00	*Normal Expenses*
N1HBR-449.925	600.00	684.68	(84.68)	600.00	*Normal Expenses*
KA1OUI-145.03	50.00	0.00	50.00	50.00	*Normal Expenses*
[illegible]BRI - 53.81	0.00	848.25	(848.25)	150.00	*Normal Expenses*
R&D/Contingency	500.00	25.00	475.00	500.00	
Field Day	100.00	0	100.00	200.00	
Total	8100.00	6503.20	1596.80	8,900.00	*See Note 1.*
1995-96 Administration					
Newsletter	1500.00	782.19	717.81	1500.00	
Meetings	600.00	590.49	9.51	600.00	
President's Account	50.00	83.78	33.78	50.00	
Secretary's Account	800.00	520.38	279.62	500.00	
Treasurer's Account	100.00	79.16	20.84	100.00	
Insurance	850.00	837.00	13.00	850.00	
P.O. Box	100.00	104.00	(4.00)	104.00	
Voice Mail/Pager	150.00	246.00	(96.00)	150.00	
Miscellaneous	200.00	191.86	8.14	200.00	
Total	4350.00	3434.86	915.14	4,054.00	
Test Equipment Fund- remaining from money raised by raffles	1045.99				

Note 1: As we had a surplus last year, we are budgeting for a deficit to buy antennas for Stoneham 2 meter and 440 repeaters.