oct 93

SQUELCH TALES

THE MONTHLY NEWS LETTER OF THE
NORTH FULTON AMATEUR RADIO LEAGUE

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Treasurer Fred Moore N4CLA
Secretary Steve Knittel KC4YBO

REPEATERS
145.470 Mhz out (- 0.6 Mhz)
147.060 Mhz out (+ 0.6 Mhz)
444.475 Mhz out (+ 5.0 Mhz)

NFARL BBS 552-0868 (1200-2400-9600 8 N 1) Dan Turner WA4BRO SYSOP

NORTH FULTON AMATEUR RADIO LEAGUE REPEATER GUIDE
145.47 - 147.06

OPEN COMMANDS

1 ECHO MODE
2 DEVIATION TEST
*3 DTMF TEST
*4 TIME
*5 SINAD TEST
*6 FREQUENCY TEST
*7 DISPLAY MAIL
*8 SEND COMMAND OUT LINK
*9 PLAY ANNOUNCEMENT

USER COMMANDS

**0*N EMERGENCY PATCH
**1*N USER PATCH
**2   PATCH REDIAL
**7   MAILBOX   ＊3
**8   OPEN MAIL   ＊4
**10   CHANGE PASSWORD
**12   RECORD USER NAME
**15   USER PROFILE
**20   SPEEDIAL MAINT
**25   USER HANGUP CODE
**30   CTCSS COMMAND

**   USER# + PASSWORD

N - NUMBER TO DIAL
* - CANCELS FUNCTION

* - VOICE INPUT

＊= REQUIRED DELIMITER

From the President's Station
by Jeff Weinberg, AA4XC

1993 is just about over. Only three more months to go. It
really only seems like yesterday that 1993 started, and my year
as President began. I really have enjoyed the past 9 months in
general, and especially serving as the President of this fine
club. In November, the elections for officers will again be
held. Anyone who is interested in any elected office of the
N.F.A.R.L. should express that interest to the selection
committee between the October and November meetings. The
selection committee will be chosen at the October meeting.
By-the-way, there will be no program in November in order to
allow for the proper amount of time to be spent on this important
event.

The program for September was fantastic. Ned Mountain, WC4X,
gave us a first-hand display of his creativity and
resourcefulness when he talked about operating "bicycle mobile".
Thanks again for the great program Ned, and the education.

The program for October will be a special one. It's something
that is not directly related to Amateur Radio, but maybe of
interest to you the next time you want to buy a radio. The
subject of the October meeting is schedule to be 'Credit'. What
is credit, what is a credit report, how do you check your credit
report to see if the information is accurate, how many credit
reports exist for you, how do you correct mistakes that other
people may have made concerning you credit information, what are
your rights, and how do you protect yourself against people who
would use your credit for their own gains. We will have a
representative of the Credit Community Education Team at the
meeting to answer these and other questions. I felt that it was
time for a break from Amateur Radio topics. And with the
holidays coming up soon, it was the perfect time to review credit
basics. Whenever I've seen this presentation, it has been an
excellent and informative one.

Now let's talk about what the club has done in the past year:

1.   Growth of active members has been outstanding. On
January 1, the N.F.A.R.L. began the year with about 125 active
members. To date, we now have 198 active members. Will we hit
200 before year's end? Who knows?

2.   The Monday Night Net continues to grow. The number of
check-ins for 1992-1993 was up over 80% from the first year of
activity. There is a full net report to the membership included
in this month's newsletter. In this report, I also announce the
winner's of the 1992-1993 Net Honor Roll certificates.

3.   The yearly auction went well in May, with the club
making over $300 for the treasury.

4.   The money came to good use because we had to replace
the repeater's computer on Sweat Mountain during the summer. The
computer at the water tower is next up for replacement.

5.   Field Day was a great success, thanks to our fearless

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Field Day leader Steve Knittle, KC4YBO. Point totals were way up, and there are already plans being made to get ready for next year.

6.   We have initiated incorporation procedures with the State of Georgia. Jim Altman, N4UCK, is handling this for us for only the out-of-pocket cost required by the State. Thank you Jim. Jim will also help us fill out the 501C3 Non-Profit Organization papers for the IRS. There should be no cost to the club for that filing. In all, Incorporation and 501C3 application should cost the club about $150 total. When compared to the $650 bid we received in the Spring, this really is a bargain.

7.   We went to an every other month distribution of our newsletter to save on postage, paper, and time. I believe that you will agree with me that this has worked out well, with a better newsletter for the membership as a direct result.

8.   We changed our fiscal year from January through December to July through June. To accommodate this change, we will be going to those members who joined at the end of 1992, or beginning of 1993, and asking them for one-half year's dues in December, 1993. For instance, if your normal yearly dues are $30, then you will owe $15 by December 31. Please note that I said that dues are due by December 31. In the past, we always had a grace period of several months before repeater privileges were ended and the newsletter was stopped. This was not fair to the membership of the club that paid on time. So, with the move to the new fiscal year, all grace period privileges were ended. Those accounts that are not paid-in-full by December 31 will be deactivated by January 2. If you have a problem with paying yours dues on time, please contact any one of the officers, and we will be happy to work with you in this matter. The club does not want to cut off anyone's privileges when something else can be worked out privately. But, you have to let us know if you want to work something out.

The club continues to explore new avenues for generating revenue to support our repeater and club activities. One such suggestion involves a long-distance provider. In essence, any one who signs with this provider via the club, or club member, will have 5% of their monthly bill rebated directly back to the club. The matter was presented and discussed at the September meeting by Richard Seay, KO4BO. The result was that the motion to have the club sign an agreement with the long distance carrier, to encourage club members to sign-on to the service for the benefit of the club, was shelved until the October meeting. During this time, I will check with Jim Altman to see if entering into this agreement will pose any problems for our plans to file for 501C3 status with the IRS.

We discussed, briefly at the September club meeting, where the Christmas party will be held in December. It was the consensus of the attending membership that the party should be held at the same place as it was held last year, the club house of the Chimney Springs sub-division in East Cobb county. There will be maps to the party ready at the November meeting. But, for you souls who would like to scout out the location during the daylight hours, here are some preliminary directions to get you

there:

1.   If coming North from Sandy Springs, go up Johnson's
Ferry Road over the Chattahoochee River and past Parkaire Mall.
Continue North on Johnson's Ferry past Merchant's Walk and cross
over GA 120. Go 5 traffic lights past GA120 to Post Oak Tritt
Road. Turn right on Post Oak Tritt and go to the flashing yellow
light at Tritt Elementary School. Turn left on Country Lane
(this will be the Chimney Springs subdivision) and go one block
to the dead end. Turn left on Chimney Springs Drive. Go 2 stop
signs to the second Hearthstone Circle. (Note I said second
Hearthstone Circle.) Turn right on Hearthstone Circle.

2.   If coming East from Marietta and I-75, take GA120 to
Johnson's Ferry Road. Turn left on Johnson's Ferry Road (going
North away from Merchant's Walk). Go 5 traffic lights to Post
Oak Tritt Road. Turn right on Post Oak Tritt and go to the
flashing yellow light at Tritt Elementary School. Turn left on
Country Lane (this will be the Chimney Springs subdivision) and
go one block to the dead end. Turn left on Chimney Springs
Drive. Go 2 stop signs to the second Hearthstone Circle. (Note
I said second Hearthstone Circle.) Turn right on Hearthstone
Circle.

3.   If coming West from the square in Roswell (Roswell,
Alpharetta, and GA 400), take GA120 from the square to Johnson's
Ferry Road. Turn right on Johnson's Ferry Road (going North away
from Merchant's Walk). Go 5 traffic lights to Post Oak Tritt
Road. Turn right on Post Oak Tritt and go to the flashing yellow
light at Tritt Elementary School. Turn left on Country Lane
(this will be the Chimney Springs subdivision) and go one block
to the dead end. Turn left on Chimney Springs Drive. Go 2 stop
signs to the second Hearthstone Circle. (Note I said second
Hearthstone Circle.) Turn right on Hearthstone Circle.

The clubhouse is literally a house located one-half block up
Hearthstone Circle and on the left. There is a lake behind the
clubhouse, and tennis courts just to the right of the facility.
There is parking for about 50 cars in front of the club house,
and room for another 60 on the other side of the tennis courts.
If you park on the other side of the tennis courts, there is a
lit pathway running from that parking lot to the clubhouse
between two sets of the courts. As I said, there will be a map
given out at the November meeting.

Before the Christmas party, representatives of the club will be
contacting each member to see if they will be attending the
party, and to ask that the club member bring one item of food to
the party. Please plan to attend, and bring the family. The
club will provide the main course, paper plates, utensils, cold
drinks, coffee, and cups. Last year's party was great. We had a
fire in the fireplace, and even had a brief sleet storm to add to
the holiday mood. By-the-way, there is also a fully functional
kitchen available for use at the clubhouse.

Finally, the Amateur of the Year award will be given out at the
Christmas Party. What better time to honor the one person who
has given the most to the club for the year, than at our last
club event. I hope that you'll be able to attend, and help us
honor this special individual.

Well, that's it for this month. I hope everyone is enjoying the cooler weather, and I hope to see you at the October 13th meeting.

73's..

Jeff

1992-1993
N.F.A.R.L. Monday Night Net Report
by Jeff Weinberg, AA4RC

First off, I'd like to thank everyone, who took the time to check in, for their participation in the 1992-1993 N.F.A.R.L. Monday Night Net. It was a good year, as the Net stats prove, and shows the level of commitment, by a number of regulars, to the overall success of the Net.

Unlike last year, when I announced the winners of the "coveted" N.F.A.R.L. Monday Night Net certificates during the October club meeting, this year I am going to publish the names of the 10 top Net operators and the honorable mention stations in the newsletter prior to the meeting. I feel that these stations deserve our special thanks for their contribution to Amateur Radio and to a club sponsored function. Please join me in congratulating and thanking these stations.

The Honor Roll stations will each receive a certificate for their achievement at the October club meeting. The stations are (they not listed in any particular order):

KD4ILA	KC4BZ
KD4IKZ	KD4OIY
KC4YBT	KD4IFG
KC4YRW	KC4SIN
N4XIM	KD4IDE

Honorable mention stations are (these stations are also not listed in any particular order):

KD4LXQ	KD4FKY	KD4ZHP
KD4DHH	KB4KAY	
KD4RUC	KC4YCF	
KC4RCW	KD4FKX	
KD4APP	KD4HUH	
WB4RTP	KD4APQ	
KD4APK	N4UAY	
KC4TBO	KD4SGR	

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Once again, congratulations to both the Honor Roll stations and the honorable mention stations. I sincerely hope that you all will continue your fine level of participation in the Net throughout the next operational year. You make my job as net control much easier. By-the-way, if any station would like to qualify for an Honor Roll award, all it takes is regular participation in the Net.

As I mentioned earlier, the Net statistics are very interesting, especially when compared to 1991-1992. Here are how things broke down:

        1992-1993 Total Number of Check-Ins: 1,395
        1991-1992 Total Number of Check-Ins: 760
        Net change from first to second year: +635

        1992-1993 Largest Net: 38   3/22/93
        1991-1992 Largest Net: 39   4/20/92

        1992-1993 Smallest Net: 18   3/29/93, 4/19/93, 10/12/92,
               11/9/92
        1991-1992 Smallest Net: 5   10/7/91, 12/2/91, 12/23/91

        1992-1993 Longest Net: 50 minutes   6/21/93
        1991-1992 Longest Net: 58 minutes   6/22/92

        1992-1993 Shortest Net: 19 minutes   3/29/93
        1991-1992 Shortest Net: 7 minutes   12/2/91

        1992-1993 Average Number of Check-Ins per Net: 27
        1991-1992 Average Number of Check-Ins per Net: 17
        Net change from first to second year: +10 check-ins per Net

        1992-1993 Average Length of a Net: 32 minutes
        1991-1992 Average Length of a Net: 24 minutes
        Net change from first to second year: +8 minutes

        1992-1993 number of individual stations participating: 201
        1991-1992 number of individual stations participating: 161
        Net change from first to second year: +40

As you can see, the Net has grown considerably in the past year. Check-ins are up better than 80%. Other 1992-1993 stats of interest include:

        Swap Shop Items: 59
        Discussion Items: 23
        Announcements: 48

That's it. I hope this has shed some light on the Net. If you're not familiar with the Net, and would like to learn more, please feel free to join us every Monday night at 8 PM. You're always welcome.

73's and thanks again.

Jeff

FROM THE SECRETARY

Jeff, AA4RC called the August 11 meeting together at 7:30. There was no treasures report. Minutes of the July meeting were read & approved.

Jeff, KD4IFG gave us an update on the 5.47 machine. It still has the internod noise and all scanners are busy trying to locate problem frequencies.

Vern Fowler,WH8LA, as new president of the ARC presented NFARL with two checks. One for $500.00 (security) and $200.00 (alternative activity room) for our help with the Atlanta Ham Fest. Vern also discussed briefly the new changes in the 2m rules. Ok to phone for a wrecker.

Avery, WB4RTP set up a demonstration of ATV. He hooked up with 4 other hams from Lithonia to West Cobb. We were able to listen to and see their "shacks" and they in turn were part of our meeting. The demo peaked a great deal of interest in ATV.

Meeting was adjourned at 9 PM.

Steve Knittel , KC4YBO

FROM THE SECRETARY

Jeff, AA4RC called the September 8th meeting together at 7:35. He mentioned that a major manufacture will be donating the H F equipment for the Sci Trek station.

Treasures report: Yes we have money in the bank.

Technical committee: We still have noise but maybe getting closer to a solution.

GARS net is at 9:00 on Tuesday nights and after net code practice is given. Frequency 147.075 +

The Christmas Party will again be held in E Cobb at the same club house as last year. Mark your calender for DECEMBER 8 th. GREAT TIME and SPECIAL AWARDS.

Jim Altman, N4UCK has offered to help us with incorporation and setting up of non profit status. The only cost will be the $150-200.00 required by the state.

Richard, KD4BG presented a very interesting way for the club to raise some funds. The idea was use of a phone plan where members would receive a 10 x savings on their phone bill and the club would receive a 5x pay back. A motion was made that we accept the presentation. After much discussion the motion was tabled till the next meeting.

Ned Mountain, WX4X then presented the program on bicycle mobile HF. Ned brought in his bicycle and showed how he assembled his rolling station. Included was a "poor mans outbacker antenna". To cap off the evening Ned played us a tape of a conversation with a ham in Belgium and the break in of another ham in Israel , with Ned only running 2 watts. So much for "big gun" station needed.

The meeting was closed at 9:15.
Steve Knittel, KC4YBO

Adventures in NT Land

by Jeff

Weinberg, AA4RC

First off, a little lesson in computer programming. Please
follow the next series of statements carefully:

```
        If (you do not like computer related articles)
                Consider going to the next article.
        Else
                Read on.
        Endif
```

Let me say that if I had been born 150 years ago, I probably
would have been a scout for the 7th Calvary. Riding point,
looking for the Indians. And, we all know what happened to the
7th Calvary. Even in 1993, I enjoy riding point. So I decided
to take advantage of a recent Microsoft offer to be a Windows NT
3.1 user.

After all, this is the first commercial release of a major new
operating system, and everyone knows what that means. Little
hardware driver support, code bugs at every turn, unoptimized
performance, frustrations getting software to work that you know
works under DOS, and the list goes on and on. But, what the hey.
I had already fully explored DOS 6.0, Windows 3.1, and OS/2 2.1,
and had perfectly good systems up and running under each of them
doing exactly what I wanted them to do. What better time to
shake up the status quo? After all, this is Windows NT. And,
even though the box says version 3.1, it really is version 1.0.

The Press has had a field day lately extolling not its virtues,
but NT's shortcomings. It is a very hefty operating system for
IBM compatible PCs. If fully loaded with all its development
software, it will eat up 90+ megabytes (Mb) of your system hard
disk. Though the operating system itself only consumes about 18
Mb. Additionally, commercial testing has shown that, on average,
most Windows programs could run 20-90% slower under NT than they
do under DOS/Windows or OS/2 2.1. And, memory requirements have
been set by most reliable sources at at least 12 Mb of RAM. You
know, all the system resources and performance requirements that
we care about, and cost us the most money.

Now, I'm what you might call a "Power User". I like using
software. I like putting it through its paces, and seeing just
how far I can push it before it breaks. In other words, I like
to push the envelope that other people have built. And, since I
had the time and opportunity to take on this challenge, I decided
that it was time to ride point again.

Number one, I am a firm believer that a well backed up system is one that places less stress on its owner. So, I backed up my system not once, but three times. I made sure that every precious bit of information was saved and re-saved. Next, I totally reinitialized my hard disk, wiping everything from it, even DOS. I then installed DOS 6.0. However, I did have sense enough to stay away from DOS's DoubleSpace. Next came the moment I had planned for for over two weeks. I loaded the NT CD-ROM and NT boot disk and restarted the machine.

Except for a couple of diskette swaps to load the drivers for my CD-ROM drive, the complete installation required very little input from me, and was done in about 15 minutes. What came up was a Windows interface I have used for years. Except this time, the system asks me to enter my password. I checked out some of the basic operations like: Can I print to the printer? Can I get to all of my diskette and disk drives? Does my sound card still work?

After the basic checks were completed, it was time to tackle the programs I use everyday. I loaded, from scratch, my Windows-based word processing program, spreadsheet program, and drawing program. Next, I loaded a communications program, additional printer drivers, the fonts I like, and several DOS based programs I use regularly. Next came the fun part. If the programs loaded, would they also work the same way as they do under DOS/Windows or OS/2 2.1?

I began placing all of my data files into their appropriate directories. One-by-one, I ran each program and went through all of my regular routines. Interestingly enough, the 20-40% performance hit I was supposed to be experiencing with my Windows-based programs under NT did not materialized. In fact, my Windows programs actually run slightly faster under NT on my system than they do under DOS/Windows or OS/2 2.1. As for functionality, each of these Windows programs works just like it does under DOS/Windows or OS/2 2.1's WIN-OS2. Except for one exception. Printing from these programs is actually FASTER. I have noticed that there are all new printer drivers included with NT. They not only offer more in the way of additional printing controls (i.e. half-tone control), but are optimized to run in a 32-bit environment. The number of printer drivers is impressive with about the same number of printers supported under NT as under Windows.

TrueType font control and use is exactly the same under NT as it is under Windows. In fact, all controls for NT look and feel a lot like they do under Windows. If you use Windows, you will feel completely at home with NT.

Now for the dark side of the force. I can confirm that if you do not have at least 12 Mb of RAM, NT is not for you. I have run a system performance monitor program, and NT does like to use system resources, especially if you open more than one application at a time. So, consider 12 Mb as an absolute minimum for good performance. And, there are some Windows and DOS programs that simply will not run under NT. They will flat lock-up the entire system so that a reboot is necessary. But, in all fairness, each of the programs I have found that would not run under NT try to manipulate the system hardware directly. My

old stand-by Windows communications programs that run beautifully
under DOS/Windows or OS/2 2.1 will either not run, or will act
unpredictably under NT. One program, Unicom, tries to initialize
the modem and locks the system. Another program, MicroLink, ran
beautifully, but once connected to another system it told the
modem to switch to 7-E-1 mode rather than staying in the normal
8-N-1 operational mode. This caused a connect session with most
standard BBS's to fail. However, after working with the author
of the program, a simple fix was employed, and I now have a fully
functional communications program again. I have found at least
two communications programs that do work fine under NT. They are
PowerCOMM and SoftTerm. On a great note, the communications
driver (comm.drv) that comes with NT has also been rewritten to
work in a 32-bit environment. Running the same communications
program with the same settings on the same system with the same
modem, my communications throughput is now 48x faster than under
DOS/Windows or using a native OS/2 communications program under
OS/2 2.1.

My Windows' CD-Player programs don't work. They just lock up the
system. To date, I have not found a single CD-Player program
that runs under Windows that also runs under NT. There is a
CD-Player that comes with NT, but it works erratically with the
SoundBlaster board and Panasonic CD player. I have also found
that I can get no audio to come out of my CD-ROM player through
the sound board. The connection is good because it works under
DOS, but the new Creative Labs NT drivers are still in beta and
are not totally functional yet.

The number of video resolutions that are supported under NT is
also impressive. Right now, using my ATI graphics board, I am
running at 800x648 resolution. (NT will support 1280x1024
resolution on my system if I want it to.) Interestingly enough,
the NT installation program defaults to a very conservative
648x400 VGA mode for installation. Though you can easily change
to the resolution you want after system installation. A nice
feature of NT is if you get to experimenting with video
resolutions and come across one that is not supported, when you
reboot the machine, NT will prompt you to press the space bar to
return to the last working system setup configuration. This
makes experimenting easier and takes some of the danger out of
changing key operating modes.

Booting to Windows NT takes more time than for DOS or OS/2.
There seems to be more disk activity going on during the NT
startup than for the other operating systems. NT checks your
system configuration prior to loading, lets you press the
spacebar to return to the last working configuration, sets the
video mode, and starts the security process.

In all, my experiences with Windows NT have been very positive.
Once I got a working communications program up and going, and
completed my program loads, that comfortable feeling you get when
you have a working system again returned. So, for the time
being, I plan on keeping NT where it is, and to keep on riding
point.

old stand-by Windows communications programs that run beautifully under DOS/Windows or OS/2 2.1 will either not run, or will act unpredictably under NT. One program, Unicom, tries to initialize the modem and locks the system. Another program, MicroLink, ran beautifully, but once connected to another system it told the modem to switch to 7-E-1 mode rather than staying in the normal 8-N-1 operational mode. This caused a connect session with most standard BBS's to fail. However, after working with the author of the program, a simple fix was employed, and I now have a fully functional communications program again. I have found at least two communications programs that do work fine under NT. They are PowerCOMM and SoftTerm. On a great note, the communications driver (comm.drv) that comes with NT has also been rewritten to work in a 32-bit environment. Running the same communications program with the same settings on the same system with the same modem, my communications throughput is now 40% faster than under DOS/Windows or using a native OS/2 communications program under OS/2 2.1.

My Windows' CD-Player programs don't work. They just lock up the system. To date, I have not found a single CD-Player program that runs under Windows that also runs under NT. There is a CD-Player that comes with NT, but it works erratically with the SoundBlaster board and Panasonic CD player. I have also found that I can get no audio to come out of my CD-ROM player through the sound board. The connection is good because it works under DOS, but the new Creative Labs NT drivers are still in beta and are not totally functional yet.

The number of video resolutions that are supported under NT is also impressive. Right now, using my ATI graphics board, I am running at 800x640 resolution. (NT will support 1280x1024 resolution on my system if I want it to.) Interestingly enough, the NT installation program defaults to a very conservative 640x480 VGA mode for installation. Though you can easily change to the resolution you want after system installation. A nice feature of NT is if you get to experimenting with video resolutions and come across one that is not supported, when you reboot the machine, NT will prompt you to press the space bar to return to the last working system setup configuration. This makes experimenting easier and takes some of the danger out of changing key operating modes.

Booting to Windows NT takes more time than for DOS or OS/2. There seems to be more disk activity going on during the NT startup than for the other operating systems. NT checks your system configuration prior to loading, lets you press the spacebar to return to the last working configuration, sets the video mode, and starts the security process.

In all, my experiences with Windows NT have been very positive. Once I got a working communications program up and going, and completed my program loads, that comfortable feeling you get when you have a working system again returned. So, for the time being, I plan on keeping NT where it is, and to keep on riding point.

Spot Evaluation:

I've heard all the jokes that NT stands for "Not There" or "Needs Tweaking". Well, from what I've seen to date, NT is definitely here, but still needs some tweaking. Compared to where a number of new products are when they first came out, NT is very impressive. But, don't let the "Version 3.1" stamp on the box, documentation, and diskettes fool you. This is still version 1.0, and not everything may work for all people.

Will NT work for all computing situations? "No". But, then again, neither will DOS, Windows, or OS/2. The bottom line is that if you need a Microsoft Windows-based 32-bit operating system for your 32-bit computer (386 or above, with a 486-33 highly recommended), then you might want to consider Windows NT if, and that's a big if, you can afford the operating system and resources it requires. And, these are stiff basic requirements.

Well, that's it for now. Every now and then, I'll let you know more about my adventures in NT land.

By the way, if you would like to submit an article about a topic that you feel would be of interest to some or all of the N.F.A.R.L. membership, please feel free to do so. You can submit an article by computer by making sure that the article's file is in a plain ASCII format and is uploaded to the N.F.A.R.L. BBS (run by WA4BRO). The number for the bulletin board is located on the front page of the newsletter along with other key club telephone numbers.

Until next issue. 73's. And, have a good Halloween and Thanksgiving.

Jeff

Intermodulation Analysis

N4CLA Fred

WHAT IS INTERMODULATION?

Intermodulation (IM) occurs whenever one or more radio frequencies are combined in a non-linear device. This produces sum and difference frequencies which are known as IM products. The non-linear device may be a transmitter, a receiver, an isolator, a bad connector or any number of other items. Sometimes the condition is desirable, as in the mixer stage of a superheterodyne receiver where signals are combined and selected to produce the familiar "Intermediate Frequencies" (I.F.). Most of the time however, intermodulation is undesirable and steps must be taken to prevent or eliminate the conditions which give rise to intermodulation. Such measures usually include the use of circulators and cavities to prevent signals from entering the final amplifier stages of transmitters, and the use of band-pass cavities at the inputs of receivers. These factors are of special concern at mountain top repeater sites.

The number of receivers and transmitters at most repeater sites can vary anywhere between a dozen to a few hundred. The number of intermodulation products which can be generated could be in the thousands. A site manager may be able to exert total control over the conditions at a particular site, or only nominal influence over the activities of other users of the site. In either case, a site manager faced with an intermodulation problem would be faced with the formidable problem of tracking down the one combination out of possibly tens of thousands which might be the source of the problem.

This program is designed to make that task easier. Even though the number of intermodulation products is theoretically infinite, only a limited number of them are significant for a given set of receivers. The products which we are mainly interested in are only those which will fall on or near a receiver frequency, and are of low enough order to be of significant amplitude. What does "order" mean? The general scalar form of the equation for intermodulation products is:

For two transmitters, Tx(1) and Tx(2);
$$F = nTx(1) + mTx(2) \text{ and...}$$
$$F = nTx(1) - mTx(2) \mid n = 1,2,3... \text{ where } n = n+1$$

The order of the product is defined as n+m. These are merely the coefficients of the terms of the equations.

As you can see, when n is 1, m is 2 and the order is 3, the order of the product is always odd. And since the frequencies involved are really phasors, the sign of F is related to its phase and not its amplitude. So for purposes of analysis we can ignore it.*

* A phasor is a vector which rotates about its origin with time. The intermod program uses absolute value to eliminate the signs.

The accompanying program to this document calculates intermodulation products for, two and three-transmitter

combinations and second and third harmonics of single transmitters. Two-transmitter combinations of 3rd, 5th and 7th order; and since the coefficients are all 1, 3rd order products of three-transmitters, the equation for three-transmitter products is:

$$F = Tx(1) + Tx(2) - Tx(3)$$

We artificially limit the order of the products to 7th because as the order increases, the amplitude of the product signal decreases and therefore becomes insignificant. The program would take forever to finish calculating an infinite number of products.

Once the products of interest have been calculated its merely a matter of sorting through the data to see which products fall on which receiver frequencies and print the results. Since the program incorporates a sort function, we can get a list of the "hits" in ascending frequency and finding out which transmitters might be candidates for "most likely suspect" in our search. Intermod Solution on 145.47Mhz

I would like to thank numerous people for assisting in the solution to the intermod problem on the 145.47mhz repeater. I thank Jeff Medin (KD4IFG) and Chuck Daley (KD4LXQ) for all of their diligent and persistent listening to scanners and suspect frequencies that different intermod programs produced, Bill Hampton (WA4YHZ) for his assistance in coordinating the move of some duplexors on two of the commercial pagers, Mike Connell (WA4FHJ) for the loan of his Tektronics spectrum analyzer, Dan Gustafson (N84PYL) for his technical assistance, Frank Lombardi (W82HHG) for the use of his IFR-1500, David Fellows (KD4APK) for the use of his 2mtr beam and numerous others who provided frequency information as well as their time on the telephone and on the hill. I also want to thank the commercial people that had the problem, who will remain unnamed, for their interest in resolving this problem and their willingness to remain involved. I would also like to thank all the members of the club who remained faithful to the organization and confident that there was light at the end of the tunnel and sticking around, and to those who volunteered to help and never got the chance. I would like to say to those who became discouraged with the intermod and ran off to other frequencies because the repeater "HAS A PROBLEM AND NO ONE SEEMS TO BE WORKING ON IT". I'm sorry that you might have felt that nothing was being done to resolve the problem and decided that the grass was greener in other areas, when in fact, there was something being done and time is sometimes the price that has to be paid for the "HIGH SITES". You must also remember that this is a NON-COMMERCIAL venture by amateurs and no one is being paid to maintain the equipment as well as provide a 24 hour/day system that is impervious to these problems. There are no systems that are impervious to these problems. These type of problems are not easy tasks to resolve. You just cant go up to the repeater and turn off intermod. You also need to remember that these high sites, such as Sweat Mountain, are premium locations and there will usually be hundreds of transmitters at these locations which increases the likelihood of these types of problems. As an example, some of the types of users located at this site are Georgia Power, NCI, Southern RR, commercial paging companies, Bell South Mobility, Pactel Cellular, mom & pop TV

transmitters, multiple sites for rental space, and not to forget the amateurs. We currently have a list of 278+ transmitters located on the mountain and might add that this list is still incomplete.

The solution for this problem will either be replacing a feed line, a connector or an antenna at one of the above mentioned sites on the mountain. There are plans to get an antenna crew in to replace the failing component and when the job is completed we will be notified.

As an additional note for those that might not have known, 146.88Mhz was also having the same problems we were having. I believe that their problem has also been resolved.

This leads us to the next topic. How can we reduce the possibility of this occurring again? The topic of voting remote receivers, their cost and their locations will be discussed at the January meeting in 1994. We hope to see you there so you can listen to our proposal and thereby allow your voice to be heard on this matter. This is a group effort and not an individual responsibility.

Again I thank all of you out there for your patience.

Fred Moore KN4CLA
Chairman, Technical Committee

October 4, 1993

Subject: Public Service Event List - Revision #4

The following is a list of Public Service Events that will take
place over the next few months that desire amateur radio support.
This list will be regularly updated and distributed.

Anyone with additions or corrections to this list are requested
to contact me with information.

Anyone wishing to act as the Communications Coordinator for an
event can contact me and I will provide what information I have
about an event.

If anyone is familiar with an event that might benefit from
amateur radio support can pass the information to me and I will
post the event in this list.

For any event where the Communications Coordinator is 'TBD', call
me and I will forward information to the person that takes on
that role.

My contact information is

Chuck Daley, KD4LXO
Telephone (404)-475-8140
Compuserve 73457,3114
Internet CHDALEY@delphi.com
2M Repeater 145.570 (NFARL)

This list can be found on the following bulletin boards:

WA4BRO	552-0868
Scan Atlanta	631-1772
HATPARC	529-6575
4YI	973-6666
Scientific Atlanta	903-5407
Top of the Rock	921-8687
Moonlight BBS	449-7795
MedStat	728-0452

If anyone would like to see this on their favorite board (if it
not one of the above), have the SYSOP contact me and I will be
glad to add it to the distribution.

The list will also be available at Ham Radio Outlet in the near
future.

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Public Service Event List as of October 4, 1993

Event: University of Georgia Home Football
Sponsor: University of Georgia
Date: Oct 9, 1993
Time:
Comm. Coordina: George Kelley, WB4VHT, (706)-546-7713

Description: Radio support for Red Cross medical teams.
             Talk in 146.745 MHZ. Meet at T-Bones on
             Baxter street (ATHENS) 2 hours before

Event: Roswell Youth Day Parade
Sponsor:
Date: Oct 9, 1993
Time: 1000-1200
Comm. Coordina: TBD

Description: Parade route coverage.

Event: Athens/Atlanta Road Skating Marathon
Sponsor: Atlanta Peachtree Road Rollers
Date: Oct 17, 1993
Time: 0900 - 1600
Comm. Coordina: TBD

Description: Athens to Atlant Roller Skating Event. At
             least four stations required.

Event: AIDS Walkathon
Sponsor: AID Atlanta
Date: Oct 17, 1993
Time:
Comm. Coordina: TBD

Description: Walkathon starting and finishing at Piedmont
             Park. Communications needs unknown at this
             time.

Event: University of Georgia Home Football
Sponsor: University of Georgia
Date: Oct 23, 1993
Time:
Comm. Coordina: George Kelley, WB4VHT, (706)-546-7713

Description: Radio support for Red Cross medical teams.
             Talk in 146.745 MHZ. Meet at T-Bones on
             Baxter street (ATHENS) 2 hours before

Event: March of Dimes Bike America
Sponsor: March of Dimes
Date: Oct 23, 1993
Time: 0600-1600
Comm. Coordina: TBD

Description: Multi length bicycle event. Saturday only.
             15 to 20 operators needed.

Event: Head of the Hooch Rowing Regatta
Sponsor: Atlanta Roving Club
Date: Nov 6, 1993
Time: 0700 - 1600
Comm. Coordina: Jeff Hedin, KD4IFG, 839-1618 (Digital
                Pager)
Description: Rowing Regatta. This is a sprint race
             requiring roughly 15 radio operators.
             Located on the Chattahoochee in Roswell.

Event: University of Georgia Home Football
Sponsor: University of Georgia
Date: Nov 13, 1993
Time:
Comm. Coordina: George Kelley, WB4VNT, (706)-545-7713

Description: Radio support for Red Cross medical teams.
             Talk in 145.745 MHZ. Meet at T-Bones on
             Baxter street (ATHENS) 2 hours before

Event: Atlanta Marathon
Sponsor: Atlanta Track Club
Date: Nov 25, 1993
Time: 0600 - 1200
Comm. Coordina: Jim Spencer, WD4HFT 988-8552
                Tim Colittle, KA4RCR 485-8979
Description: Full and half marathons taking place on
             Thanksgiving Day. Located between Piedmont
             park and Chamblee.

CALL	FNAME	LNAME	MEMBR_ID
AA4RC	Jeff	Weinberg	084
AA4ZC	Lawrence D	Boden, Jr.	072
AD4GJ	Clayton	Patterson	063
AG6R	Bryan	Carl	336
K3GA	Stuart	Kravitz	862
K3PPY	David	McBride	059
K4AHJ	Tom	Knight	097
K4FLS	Sam	Agee	046
K4IIP	Joe	Mehaffey	032
K4JHH	Harold C.	Myers	071
K4JHX	Alan	Dages	028
K4KHE	Richard	Weigand	254
K4UAF	Don	Rogers	252
K4UNJ	William A.	Sandusky	052
K6EID	Phil	Finkle	092
KA8GKK	F. James	Gray	027
KA4GGI	Joseph	Pastuch	030
KA8DPR	David M.	Driggs	051
KA9NYJ	Nancy	Gilmer	298
KB4KAY	Todd	McGinnis	272
KB4KBS	Scott	Straw	131
KB4KHD	Lane	Watts	317
KB4HUC	John I.	Hess	064
KB4VSS	Greg	Culpepper	026
KC4KHA	Russell	Akridge	255
KC4R1B	Al	Fischer	089
XC4ROW	Kenneth	Snyder	228
KC4VZQ	Brian	Dugger	357
KC4HUZ	George A.	Scott	275
KC4VBO	Steve	Knittel	231
KC4VBT	David	Walls	042
KC4YCF	Michael	Hough	248
KC4YRH	BILL	Slatton	268
KC4ZLU	Paul	Grether	289
KD4APF	Brint	McClellan	281
KD4APK	David	Fellows	018
KD4APM	Charles	D'Englere	007
KD4APN	Brenda	Munk	291
KD4APO	Pat	Munk	289
KD4APP	Don	Woodward, Jr.	259
KD4APT	Shiona	Cavaliere	283
KD4ATP	John	Keown	301
KD4DLV	Brian	Greer	325
KD4ECE	Philip	Zeigler	302
KD4FB	Daniel	Ortiz	341
KD4FKX	Dixie	Smith	340
KD4FKY	David	Smith	339
KD4FTZ	Ina	Earhart	057
KD4FYJ	Bill	Pickens	303
KD4HCE	Chris	Craig	292
KD4HFR	Mario	Ruhrke	328
KD4HLM	Douglas	Allen	312
KD4HMG	Bob	Underwood	322
KD4HYX	Donna	Pickens	304
KD4IKZ	David	Jacoby	327
KD4ILA	David	Mayer	326
KD4ION	Clayton	Hagar	091
KD4KEV	Martha	Clark	333

CALL	FNAME	LNAME	MEMBR_ID
KD4LJG	Chris	Cammons	165
KD4LJI	Richard	Cammons	169
KD4LXO	Charles	Daley	335
KD4LXT	Joshua	Arensberg	349
KD4NZO	Ronald	Greer	313
KD4NC	Douglas B.	Drye	881
KD4NHR	Jim	Lynch	066
KD4ORI	Bo	Harrell	858
KD4ORJ	Michael P.	Del Pozzo	328
KD4PEN	Joel	Garrett	821
KD4QNJ	Donald	Reed	342
KD4RFK	Richard	Patchin	860
KD4RTY	Caroline	Keown	300
KD4RUA	Phillip	Butler	148
KD4RUC	Charles	Tinsley, Jr.	352
KD4SGX	Alan	Manning	351
KD4SGR	William	Reynolds	079
KD4SHE	Marshall	Magee	037
KD4SHH	David	Rice	094
KD4TFG	Jeffrey	Medin	053
KD4TWN	Ann	Seay	237
KD4URM	Jim	Moore	065
KD4VHU	Kim	Rice	096
KD4VTX	Dale	Lovell	078
KD4WLB	George	Melas	067
KD4WLC	James	Booth	833
KD4YDD	Scott	Brown	069
KD4YRA	Luis	Velazquez	838
KD4ZHP	Bill	Agee	876
KE4ATI	Ray	Cammons	163
KE4AXH	Brandon	Howard	281
KE4B5B	Ted	Croney	189
KE4COG	Jonathan	Lorber	887
KE4CHG	Ken	Bishop	888
KE4EPS	Judie	Medin	054
KE4EPU	Gregory	Nieland	850
KE4FOS	Edward R.	Hotchkiss	849
KE4FI	San F.	Osborne	802
KF4ZZ	Justin C.	Converse	170
KG6TW	Jim	Willis	015
KI4NO	Dan	St. Andre'	880
KJ4CB	C. Douglas	Jordan	006
KM4FW	Delaine	McCarthy	266
KM4KB	Charles	Earhart	056
KM4NG	Martin	Stern	022
KM4OB	John V.	Vogt III	212
KO4CA	Mac	Brown	278
KO4SV	David	Vanderwall	896
KO4XF	William H.	Burnette	316
KQ4BG	Richard	Seay	337
N0AL	Alan	Cassel	884
N1ABH	James	Alderdice	825
N1NHG	Joseph	Balch	343
N2EST	James	Massara Jr.	885
N3A1A	Douglas	Reed	024
N3FDT	Michelle	Bonelli	330
N3FDU	J. Michael	Bonelli	329
N3KSD	Tim	Edge	315

CALL	FNAME	LNAME	MEMBR_ID
N4CLA	Fred L.	Moore III	083
N4GFF	Carl	McKinney	085
K4HRA	Lewis	Cason	011
N4JDO	Marty	Olson	047
N4JJH	Lawrence	Boden	078
N4LPU	Clifford	Walker	074
N4HU	William	Hoverd	199
N4ODR	Janice	Bradley	141
N4OSQ	Diana	Hess	264
N4PUB	Dan B.	Wingate, Sr.	077
N4PZA	Patton	McKinney	185
N4OXH	Alan L.	Stern	016
N4QYD	Harvey	Kaplan	277
N4SE	George W.	McCarthy	265
N4TOL	John D.	Tramontanis	177
N4TZN	Charles	Golsen	044
N4UAY	Hamp	Smith	203
N4UJO	Larry A.	Richardson	202
N4UUO	Walter	Wilson	207
N4VTH	Patty	Smith	206
N4VYP	Dorothy	McKinney	285
N4WBI	Carolyn	Caldwell	211
N4WTA	Nancy S.	Vogt	213
N4WWD	J. Ward	Peters	246
N4YIE	David	Gibson	280
N4ZCX	George	Price	251
N4ZM2	Dennis	Boylan	023
N4ZUO	David	Cavaliere	282
N6JEE	Rise	Witt	286
N9DER	Ronnie	Gilmer	190
N9HUT	Rick	Forbes	083
NC4E	John	Sanders	073
ND4D	Charles H.	McGinnis, Jr.	090
W8PSM	Ken	Dickson	249
W2HIK	Fred W.	Holcomb, III	247
W4DOT	William R.	Plage	181
W4EJF	Forrest M.	Shelton	018
W4IRZ	Bill	Reynolds	253
W4LDD	Hovard R.	Holley, Jr.	274
W4MAR	George	Ryan	334
W4SHP	Jack	Van Hutten	035
W4UXJ	Marvin	Moss	049
W4WKP	Johnny	Fearon	321
W4YBV	Terry	Joyner	152
W5BQH	Joseph A.	Bautsch	328
W8BLA	Vern	Fowler	400
W8SOA	Jack L.	Conrad	055
WA2OTJ	Frank	Grantham	332
WA4BJO	Frank	Peterson	043
WA4BHN	Mike	Henry	061
WA4BRO	Dan W.	Turner	005
WA4BVI	Marvin J.	Ramos	230
WA4FHJ	Michael	Connell	006
WA4FVA	Carlton	McKoy	250
WA4POU	Gilbert	Butler	347
WA4HSP	Michelle	Weinberg	276
WA4NYD	Kenneth A.	Waldrop	173
WB1CSL	William R.	Codvise	012

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CALL	FNAME	LNAME	MEMBR_ID
WB2IMG	Frank	Lombardi	082
WB3JAU	Larry	Nottley	100
WB4ABY	Carl	Jackson	098
WD4GTL	Duane	Farmer	081
WD4PYL	Dan A.	Gustafson	028
WB4RIP	Avery	Davis	192
WB4RUU	Harland A.	Orego	245
WB4ZBV	Kimball F.	Clough	045
WB4ZIA	Ginny	Clough	145
WB6DYO	William	Witt	287
WC4X	Ned	Mountain	031
WDWFFJ	John	Bradley	041
WD4BWP	Randal	DePriest	034
WD4FSU	Owen	Adair	048
WD4RIT	G. Warren	Coleman	029
WV5R	Cameron	Clayson	039