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NETS

Conneaut Radio Club Net	147.390 FM	Sunday	7:30 PM
Radio Amateurs of Corry	147.090 FM	Thursday	8:00 PM
Ashtabula County ARC Net	146.715 FM	Wednesday	8:00 PM
Tri-State RACES Emergency Net	146.610 FM	Sunday	6:30 PM
ARES/Skywarn Net	146.610 FM	Sunday	9:00 PM
International Simplex Net	146.550 FM	Saturday	8:00 PM
The Aluminum Net	146.550 FM	Saturday	Aft Sim Net
2 Meter AM	144.450 AM	Monday	7:00 PM
6 Meter AM	50.5300 AM	Wednesday	7:00 PM
6 Meter SSB Net	50.1500 SSB	Sunday	7:00 PM
Lake Erie Emergency Net	29.0000 SSB	Sunday	8:00 PM
Novice-Tech Net	28.4000 SSB	Wednesday	8:30 PM
Radio Amateurs of Corry (HF)	28.3300 SSB	Tuesday	8:00 PM
Flintstone RTTY Net	28.280 RTTY	Friday	8:30 PM
QCWA National Net	14.3470 SSB	Sunday	2000 UTC
Erie - Fort Pierce Connection	14.3400 SSB	Daily	8:00 AM
County Hunters Net	14.3360 SSB	Daily	Anytime
Mid CARS Net	7.2580 SSB	Daily	Anytime
East CARS Net	7.2550 SSB	Daily	Anytime
South CARS Net	7.2510 SSB	Daily	Anytime
Old Old Timers Club	7.2300 SSB	Thursday	2:00 PM
Rooster Net	3.9900 SSB	Daily	6:00 AM
QCWA Chapter 122 Net	3.9150 SSB	Sunday	9:30 AM
PA Emergency Management Net	3.9050 SSB	Sunday	9:00 AM
160 Meter Net	1.8930 SSB	Daily	7:00 PM



THE OFFICIAL JOURNAL OF THE RADIO ASSOCIATION OF ERIE

QUA-RAE

J U L Y 1 9 9 5

IN THIS ISSUE...

The President's Corner
ARRL/VEC Report
Minutes from June Meeting
APRS, Sats, and Contesting
Public Service
ARES/Skywarn
Classifieds
and more....

Hamfest
September 9

Radio Association of Erie

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Presidents Corner

Well here it is July and we have lots of fun things to do. I would like to say Thank You to Mike Rinn, WB3IGK. We all came away from the program with a little more understanding of how important it is to know how to respond to such evacuation procedures. This is one case where a little mock run helps us to do the right thing. Once again Thank You Mike. Great job...

We have a date set for the club picnic. It is Saturday, July 22. So mark that day. We will hold it at the home of June and Vern Beard on Lee Road. We would like to have some idea of how many people will be attending. If you would let N3LPO Sue or WB3DOM Ron know by July 10th, then we can get pop and meat ordered.

VE Report

Submitted by W3CG, Norma Vanderhoff, ARRL VE Liaison

For the last three years, June has been the heavy month for testing at Villa Maria. This year, May was the busy time, while June was on the light side.

Although there were some partial upgrades, the only complete one was James Donahue N3HMH of Sheakleyville, passing General.

One bright spot is that a partial first license was gained by a candidate from Wattsburg and one from Clymer, NY.

Editor's Notes

Forgive me this month as I take a little extra space to ramble about some things I've seen this month...first, while stuck in a 3 hour traffic jam near Akron this week, I had a chance to monitor several Skywarn nets that were up due to Thunderstorm and Tornado warnings in the area. Each net was being severely hampered by deliberate interference, to the point where net communications could not be conducted. This was particularly critical since some of the messages involved funnel cloud and large hail sightings, with obvious consequences if a message couldn't be relayed. I couldn't help but think how lucky we are to not have as severe a problem, but that we need to be prepared now for what is unfortunately probably inevitable.

For those who didn't notice July's QST, you might want to take a look at the results of the 1994 SET. Erie County had one of the highest scores in the Country, and by far the highest score in Western Pennsylvania. Many metropolitan areas much larger than Erie scored far lower, reflecting the fine job done by N3HPR as well everyone who participates in Erie County ARES activities. You have reason to be proud of your association...it's obvious that Erie has one of the finest ARES groups in the country. Congratulations to the Erie ARES group!

Finally, I just got back from KAS3JN's Field Day site, and I only have three things to say. Wow, wow, and wow. A 40 meter yagi with a 70 foot boom is impressive on its own...team that up with a full set of monoband beams for 6, 10, 15, and 20...and then make them Field Day portable (well, at least semi-portable). Nice job, Tom. I still want to see that 80 meter 4 element...

Newcomer Lingo

By HANS BRAKOB, K0HB

Talked to young fella on the repeater the other day who introduced himself by saying "my personal is Jim and you're my first contact." Seemed like a nice sort, delighted that he had just received his shiny new call sign, and anxious to make some new friends. Kinda sounded like I felt when I put my new call sign on the air the first time way back when, except probably brighter, 'cuz Jim is one of those young computer jocks. Me, I still got problems with the LL scale on my Pickett slide rule. Yep, I think Jim sounded brighter than me, quick to catch on to things.

But I don't think Jim will be back on the repeater.

Before I had a chance to really get to know much about Jim, or even wrangle an invite to lunch, another station, with an impressive "senior" call sign joined the contact, flashed his shiny Radio Cop badge, and proceeded to issue Jim a "verbal speeding ticket" for improper lingo on the radio. "Radio Cop" said the term "personal" (and for that matter "handle") were unwelcome in ham radio, and generally made my newfound friend feel like an unwashed interloper. (Gosh, I've been saying "handle" but I was a conditional class. Slow to catch on, you know.)

Now I should point out that "Radio Cop" took pains to appear very well meaning. Didn't use any bad words that I noticed, was quite polite, even seemed like he was trying to be "helpful." In other words, he thought he was doing Jim a favor by pointing out his transgression from our sacred Amateur Radio way of doing things.

I think Jim felt just the same way I did back in a new school in third grade when the well meaning teacher pointed out that "we don't keep our pencil behind our ear in this room." Sure enough, I looked around and none of my new classmates had pencils behind their ears. Sure was embarrassing, and at that moment I really wished I was back with my good old buddies in second grade.

One Man's Junk...

Hamfest time is rapidly approaching!

Look around the shack, basement, attic for your unused items gathering dust. Donate salable items for the RAE table.

WOW!

Call Bob Sherwin KB3ALY 866-2424
or Bob Schwimmer N3FAW 866-3027

DONATIONS ARE TAX DEDUCTIBLE. THE RAE IS IRS APPROVED
ASK FOR A LETTER FOR NEXT YEAR'S TAX RETURN!

RADIO ASSOCIATION OF ERIE



Now, if I'd been allowed to hang out a couple of days, I'm sure I would have learned how to properly stow my pencil.

And if Jim would have hung around a couple of days on our repeater I just bet he would have noticed that his lingo, perhaps learned in another radio service, was a bit out of place, and pretty soon Jim would sound "just like the rest of us."

Like I said, he seemed pretty bright to me, quick to catch on to things.

"Radio Cop", you have kept our hobby uncorrupted. I heard Jim down around 27 Mhz this morning trying to sell his barely used 2-meter HT. I'm gonna miss my new friend Jim, because I think I could have learned something from him. Maybe you could have also. Like I said, he seemed pretty bright to me, quick to catch on to things.

Gee, what do you think Jim caught on to?

PUBLISHED MONTHLY BY THE RADIO ASSOCIATION OF ERIE

THE RADIO ASSOCIATION OF ERIE IS A NON-PROFIT CLUB SERVING THE TRI-STATE AREA BY PROVIDING EMERGENCY COMMUNICATIONS DURING A CIVIL DISASTER, AS WELL AS PROVIDING COMMUNICATION SUPPORT FOR PUBLIC SERVICE EVENTS. THE CLUB MEETS AT 7:00 THE FIRST THURSDAY OF EVERY MONTH AT THE RED CROSS CHAPTER HOUSE, 4961 PITTSBURGH AVENUE, ERIE, PA. FOR MEMBERSHIP INFORMATION CONTACT BOB SCHWIMMER, N3FAW AT 866-3027.

THIS NEWSLETTER IS EDITED BY DAVE ROSS, N3PYH. SUBMISSIONS ARE ACCEPTED AND ENCOURAGED. PLEASE MAKE ALL SUBMISSIONS VIA A 5 1/2" OR 3 1/2" PC COMPATIBLE FLOPPY, IF POSSIBLE. TYPEWRITTEN SUBMISSIONS WILL BE ACCEPTED IF PC DISKS ARE NOT AVAILABLE. FOR INFORMATION CALL 454-5407 EVENINGS OR WRITE TO:

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THIS IS YOUR NEWSLETTER. PLEASE CONTRIBUTE!

Notes: SE = Special Event, HF = Hamfest, TST = Contest, QP = QSO Party

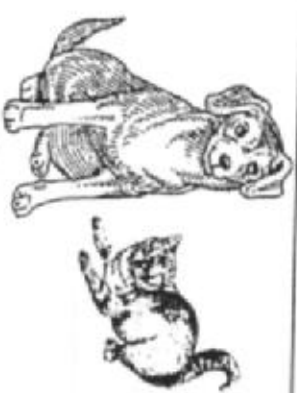
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 Canada Day TST Venezuelan TST New Haven SE Special Olymp SE
2 Canada Day TST Venezuelan TST New Haven SE Special Olymp SE	3 New Haven SE Special Olymp SE Made Awareness SE (yes, make awareness...) Barren Isl AK SE	4 New Haven SE Special Olymp SE Williamsburg VA SE Troy NY SE Made Awareness SE Barren Isl AK SE	5 New Haven SE Special Olymp SE Troy NY SE Made Awareness SE Barren Isl AK SE	6 RAE Meeting Special Olymp SE Made Awareness SE Barren Isl AK SE	7 Special Olymp SE	8 WTAW Qualifying Run Special Olymp SE Sioux Fall, SD SE Special Olymp SE
9	10	11	12	13	14	15 Wellington HF
16 Ten-Ten QP Colombian TST	17 Ten-Ten QP Colombian TST	18	19	20	21	22 Seanet TST
23 Homer City HF Seanet TST	24	25	26	27	28	29 WTAW Qualifying Run RSGB IOTA TST
30 Ashtabula HF RSGB IOTA TST	31					

OUR FRIENDS IN ASHTABULA (ASHTABULA COUNTY AMATEUR RADIO CLUB) ARE HAVING THEIR ANNUAL HAMFEST AND COMPUTER SHOW ON SUNDAY, JULY 30 AT NAPPY'S PARTY CENTER, 2255 WEST AVENUE, ASHTABULA. PUBLIC ADMISSION BEGINS AT 8:00 A.M., WITH TICKETS \$5 AT THE DOOR OR \$4 IN ADVANCE.

MOBILE CHECK-IN WILL BE ON THE 146.715 REPEATER.

THERE WILL BE A MOBILE CHECK-IN PRIZE AS WELL AS HOURLY PRIZES.

FOR MORE INFO, CONTACT KEN STENBACK, AI8S AT (216) 965-7316 EVENINGS



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Art Paavola, D.V.M.

Tom McClain, D.V.M.

Jeff Paavola, D.V.M.

Minutes

WB3JGK Mike Rinn presented a very professional program on the Conrail train derailment detailing the Incident/Command System. Mike stated the \$10,000,000 collision was the most expensive in Conrail history, involving 84 cars carrying lumber, Coors Beer, liquid plastic, chlorine, Camaros, and mayonnaise. Three engineers sustained minor injuries. The slide presentation also included a table of color photos and a graphic map showing RXR track, cars, and engine location. During the wrap up question/answer session, Mike responded to worst case scenario evacuation procedures. Thanks, Mike, it was well worth our time.

Board members and officers Present: N3LPO W3GZO KB3ALT
N3HPR W3JCQ WB3EZY
N3BZL N3HUM KA3WYO

N3LPO President Sue Seyboldt called the meeting to order at 8:15 p.m.

Tech+ upgrades are credited to:

N3TIL Debi Robson
N3PTA Somchai 'Ot' Rinnongrua.

W3AKY made the motion to accept the minutes of the May meeting as printed in the QUA-RAE. N3HPR Tom seconded and motion passed.

KB3ALT Karen read the treasurers report and detailed procedure for joining the ARRL. Send you form to Karen, she files another form so the club gets a rebate; make your check out to the Radio Association of Erie. Karen makes out another check to the ARRL; return the envelope to Karen for club records.

N3LKV Dick Ferguson, Field Day Chairman, thanked N3HPR, N3PYH, and W3GZO for the needed publicity. KB3BAM Jeremy lined up operators with time schedules and passed around a sign up sheet for volunteers and commitments to set up tents Friday at 6 p.m. N3LKV drew up maps; N3LPO coffee and doughnuts; WB3DOM radio set up; N3LKV antenna work; WB3JET antenna and rig; KB3AAK table and chairs. Still needed: ropes, coax connectors, gasoline, lights, and input from the old timers. The tent and generator are in. Walczak Park is a good location with outdoor facilities, water, pavilion, and two parking lots. Because it is in an active residential district, all equipment must be kept under close surveillance. The Field Day committee invites you to come out and have a good time.

N3FAW Bob calculated the membership total is currently 246.

N3NTJ Matt accepted a 'Thank You' on behalf of the RAE for public service communications during the Erie Bicentennial Parade. Matt passed around four sign-up sheets for the June events.

N3BZL Cliff addressed the proposed two voting amendments. At the May Board meeting, the Directors made a serious, well considered recommendation to the membership to

support closing nominations at the October membership meeting. A straw poll was taken as unanimous with all nine directors present. Cliff cited these reasons:

1. Candidate eligibility time need to check these variables.
2. Membership voting disadvantages
There were about 80 members that attended the last election meeting. That is about one-third of the club. That means two-thirds don't have the opportunity to know who is running, or to decide if they want to make the effort to attend the meeting to vote.
3. To give the candidate time to research and consider the position. Cliff read again the 2nd paragraph of the by-laws to give members still more time to consider the action. He closed with 'lets get on with having some fun in the club.'

WB3DOM Ron stated that the membership should have the final say and asked the Board to honor the membership vote. In explanation of his proposal for taking election night nominations: the fact that the last few elections were not much of an election because there were not 2 candidates running for an office and there could have been. At many good elections, nominations from the floor were taken and managed to fill all positions. On the night of this election, there may still be only one candidate. In response to the query of valid write-in votes, there are no provisions in the by-laws regarding absentee ballots. Ron agrees to abide by the decision of the membership vote.

N3FAW Bob's equal time rebuttal centered around depersonalizing the issue and consider what is best for the club. He expressed due consideration be given the candidates; that the Board has spoken and understands the decision as a recommendation and not a demand.

Voting procedure was carried out with a roll call of eligible members and paper ballots by N3FAW. WB3DOM assisted handing out ballots to 54 of the 75 in attendance. KB3ALY Bob and N3NKV John counted votes with KB3BAM Jeremy and N3TOZ Nick overseers. N3LPO Sue announced a close vote in favor of closing nominations at the October meeting and to consult her for the final tally. A short Board meeting

convened and a vote taken. N3BZL Cliff announced that the eight directors present cast their votes with the membership in favor of closing nominations at the October meeting.

W3PIX Dick displayed a variable capacitor designed to fine tune all operations for Field Day.

N3PYH Dave requested submissions for the QUA-RAE and cautioned against letting the well run dry.

N13Q Dick announced that he did not want to put a damper on Field Day but last year he received a notice from the FCC, to which he had to respond. WB3KGT Tony furnished a log sheet for every radio, to log in the band with operator signatures. Operations are to stay within 5 kc of the outer band limits.

W3GZO Dick plans to start classes in early September and hopes to have a schedule confirmed with Central High business office by Field Day. Instructors will then be needed and your help would be appreciated.

N3HPR Tom stated Hamfest plans are moving on schedule. AREA forms are available. Skywam has been moved up to 9 pm Sundays. The last Skywam Net was activated at 12:30 am - 2:30 am. Cleveland wanted a net up in spite of the hour and we were lucky to escape serious damage because the storm went south of the Erie area.

Antenna "Developments"

(Found while net surfing.....maybe better suited for the April issue of QUA-RAE, but here now for your enjoyment....)

I recently received a letter from an old friend, Joe Speroni AH0A/7J1AAA, who has been living and working in Japan for many years. He is also the author of the well-known MORSE ACADEMY software for teaching Morse Code. MOST Anyway, it was such an exciting letter that I thought it would be of interest to others here on "the Net".

Dear Sandy:

I had promised a series of articles on Japanese amateur radio, but there is something so exciting I just have to take a break and tell you about it.

It all started with the work that Ed Coan (AH6MI/7J1AAE) did on antenna pattern plotting using his personal computer. The circular, and even backward antenna patterns of some of our local TIARA club members brought home the point that what a good station needs is a good antenna. Ed's antenna looks great and the results verify it. He works regular schedules into Colorado and Maine, just like sunspots don't mean anything. My mini-beam just could not compare. Well, I got to thinking about what we apartment dwellers could do and realized that space is THE problem. How do you fit a full-sized beam on a balcony? Loading coils are the answer and the problem at the same time -- the antenna radiation resistance drops as reactance is substituted for length. High current loops develop and the power is dissipated in the

KB3A Chris displayed several prizes to be awarded at the Hamfest. A lot of money went into prizes. AES gave a truly good discount, so first rate prizes can be offered. Tickets will be out soon, and all members are urged to push them to help pay expenses and move ahead as a club with a successful Hamfest. A ham will be raffled off and a TV will be awarded as a non-ham prize.

W3CG Norma announced V.E. exams at the Villa Hammermill Administration Building on Saturday at 8 pm.

50-50 winner: N3NTJ Matt
T-Shirt winners: N3LPO Sue
N3LBI Bob
N3NLO Kevin

WB3EZY made the motion to adjourn. N3HPR seconded at 9:40 p.m.

Respectfully submitted,

Evelyn Baker
W3JQV
Secretary.

PUBLIC SERVICE

Thanks to the following amateurs who supported both their hobby and the community by helping out during the following events. Sorry for the small print, but you each deserve recognition for your generous efforts!

Hamot Time Trials (Sunday 21 May @ Presque Isle)

Matt	N3NTJ (Net Ctrl)	Greg	N3MHO
Joe	N3MLX	Dick	N3Q
Chris	KB3A	Debi	N3TIL
Kevin	N3NLO	John	N3ARKV
Tom	KE2OLU	Sue	N3LPO
Ron	WB3DOM	Cathy	N3TUE
De	N3PTA	Eric	KA3WJUN
Joe	KB3ALU	John	KA3ZXC

Erie Bicentennial Parade (Sat. 27 May @ Downtown Erie)

Matt	N3NTJ (Net Ctrl)	Cathy	N3TUE
Jeremy	KB3BAM	Dave	N3PYH
Bob	KB3ALY	Dan	N3UMH
John	N3ARKV	Sue	N3LPO
Ron	WB3DOM	Chris	KB3A
Debi	N3TIL	Tom	KE2OLU
Mike	KB3AOL	Dan	KJ3UG
Steve	N3SRD	Mark	N3SFP
Dick	N3Q		

Erie Hunt and Saddle Club Horse Trials in Edinboro on Sat/Sun June 17/18. Bold = worked both days!

Matt	N3NTJ Net Ctrl	Cathy	N3TUE
Don	N3KEH	Chris	KB3A
Debi	N3TIL	Bob	KB3ALY
Dick	KY3D	Scotty	W3STK
Dick	N3Q	Karen	KB3ALT
Joe	KB3ALU	Sue	N3LPO
Ron	WB3DOM		

RAE Public Service

The RAE public service season is already in session. This means that all the able bodied hams who wish to fulfill their responsibilities to the community now have the chance to do so. Through public service, we get a chance to hone our skills as radio operators. Learning to work with the public and other hams is just part of the fun you will have. Best of all, the experience and training you will get is invaluable in the event of a local or county-wide emergency situation.

In the FCC's Rules Part 97.1 the very first principle under Basis and Purpose states the following:
" (a) Recognition and enhancement of the value of the amateur service to the public as a volunteer non-commercial service, particularly with respect to providing emergency communications."

It appears to me that our responsibility as hams is obvious. Saving our radio spectrum isn't the only reason to help out, it's just the right thing to do.

73 N3NTJ

Please fill out and return

Are you willing to be part in the pool of hams that are able to serve their community ??
No matter how you answer please return

YES _____ NO _____

Call : _____ Name: _____

Address: _____ Phone: _____

Send to: Matthew Steger, N3NTJ, 1137 Mission Dr., Erie, Pa 16509-2930
Or bring this sheet to the monthly meeting.

Contests

CONTESTING - PA QSO PARTY STYLE - Part 1

by Chris Robson KB3A

As we start our summer hamming season with hamfests, antenna parties, Sky Warn, Field Day, and public service events, each of these activities have a unique tie to Amateur Radio's most misunderstood sporting event -

CONTESTING!!! You might ask how all those different activities relate to the Noise we hear on weekends during the fall and winter on the HF bands and VHF bands in the summer. Well let me try to relate each activity to contesting starting with hamfests.

If anyone has ever been to Dayton when they open the doors to the convention hall you already know what a pileup is! Hamfests also builds endurance to irregular eating habits, building bladder control, and relating faces with call signs. Hamfests are also the place to get those additional items needed to aid in operating your stations.

Antenna parties are a great social event and to make any communication possible, all antennas should be brought to their most optimum performance. When planning for contests, antenna parties become as well planned as the contest itself. I personally find that ham radio contesters are the first to volunteer for antenna parties because they KNOW how important a good antenna is to any effort.

Sky Warn is the ultimate in adverse operating, and anyone who has followed the check-ins during a Sky Warn call up can see that a quick response and a organized plan makes for a better informational flow. Just like in Sky Warn, Contest logging has to have a organized information flow. Have you ever noticed how the check-in process slows down when someone doesn't follow the proper format for passing information, well the same is true with contesting.

Field Day is FUN. Period. Field Day is a mixture of contesting, antenna parties, hamfesting, and emergency operating. This is a good place to get a feel for contesting, because there is no real commitment, just operating. Any operator will gladly step aside to let someone operate if they wish (somehow I don't get many volunteers for CW - must be the crazed look I have during the Field Day frenzy!!). Also Field Day is a great place to hone the operating skills for contesting, which can be learned by some of the seasoned operators that will gladly share their experience with you during this time. I learned about CW Contesting during Field Day a number of years ago from one of the best CW ops I know- Don Quiggle WA3JUNX. Don is a first class traffic handler and CW operator and is a great teacher in the art of operating CW in less than ideal conditions such as Field Day.



Public Service Events are operator events. You receive information and pass it along. In Contesting you do the same thing, you copy the information given, then pass along your information. And in Public Service, keeping a handle on the activities of the other operators is very important, since the events which are reported will affect you also. In Contesting, being aware of the activities of other stations

can help your ability to get that "rare" multiplier or let you know where your present standing is during the contest.

As you can see, Contesting is a multitude of different operating and social skills all combined into one effort. I like to compare Contesting to people who enjoy running races(which we cover in public service events), the real competitor is one's self, always trying to better their own personal best and sharing the personal victories over their limitations. We do that in contesting too, whether your operating a super-station or a QRP rig on a dipole antenna, there is always a spot for everyone in contesting.

Next time, I will cover some of the operating aids for working contest and in particular the PA QSO Party contest aids which will benefit anyone wishing to be part of the world of Amateur Radio Contesting.

QUA-RAE

ADVERTISING RATES

ONE-EIGHTTH PAGE - \$25.00/YEAR

ONE-QTR PAGE - \$50.00/YEAR

ONE-HALF PAGE - \$85.00/YEAR

It seems that the normal equations for inductance don't work with super-conducting materials -- you need a lot few turns to get the same results than at normal temperatures. Many measurements and trials later, we had a ten meter resonant wafer. This time we put a pair of 40 element beams on each wafer and stacked 4 wafers in the same assembly. That made a 320 element array on 10 meters in less than a half-foot (15 cm) cube.

The first test didn't go too well. I connected the TS-930 to the super-conducting wafer antenna and tuned it for 10 meters. At room temperature, we couldn't hear anything. Using a heat pump, the lab technicians started lowering the antenna's temperature toward the super-conducting region. I was really impressed by how small the equipment is, and started thinking it might all fit in the shack. Just then, the TS-930 froze solid, which had a negative effect on its operating characteristics. This wouldn't be so easy after all, the coax connection would need some study!

We reworked the wafers to put inductive coupling on them, but I could find no way to efficiently couple to it from the conducting ceramic material that passed RF but not heat. Probably, something that Kyocera invented just for this use. I sent the TS-940 to the ham shop in Akhahara and asked them to touch it up for me. Suzuki-san (service manager at the ham shop) asked exactly how the paint had been peeled off around the coax connector -- lightning maybe? No. I assured him -- just low temperature exposure, without saying how low the temperatures were. The project had to stay secret and besides, Suzuki-san can repair anything!

Since it looked like it might be a while before the TS-930 would be repaired, I brought out my TS-940. I had already placed an order for the Yaesu FT-1000 anyway. After verifying that in the super-conducting range the antenna was resonant on 10 meters, we connected the TS-940. The ceramic material worked and the rig operated well even as we began the cooling cycle. The band seemed dead even with the antenna at -150 degrees C. It took another 10 minutes to get to the super-conducting range -- then the TS-940 blew up. It seems our antenna had a bit more gain than the TS-940 front-end could take. Later, with 100 dB of attenuation, measurements showed 5 volts coming out of the coax. A little hard to believe, but then what do I know about cryogenic LSI antenna technology? The TS-940 was also returned to Suzuki-san, but this time he frowned a bit -- the front-end board did look like it had been hit by lightning. Not to worry, Suzuki-san can repair anything!

The FT-1000 arrived just in time to be able to continue the experiments. We built a GSK attenuator to protect the receiver and with the LSI wafer antenna still inside the lab, decided to try to make a contact on 10 meters. Boy, what a shock when we got it working. The first thing we heard was a couple of W2's talking locally on 10 meters and that was with 80 dB of attenuation. We had the antenna array on a rotatable mount. I moved it about 1 degree and the W2's disappeared. What beam width! We tuned them in again, and they were just about to sign off, so we thought we would

try to work them. The rig was tuned up at 50 watts on a dummy load; we switched in the wafer antenna and gave N2BA a call. The noise was unbelievable -- an ionized ray shot out from the antenna and hit the wall of the building. Before we knocked a hole in the band, we took out a piece of the lab wall! Ever wonder what an antenna pattern looks like in three dimensions? There was a small round hole in the wall of the lab -- about 1 cm in circumference. We cut power quickly. N2BA came back on frequency a few minutes later and said he was using his back-up rig; something had taken his main rig off the air. For some reason, the station he was talking to never came back, and so we decided not to transmit again until we knew for sure what was going on.

As near as we can tell, the antenna array has 120 dB gain over a dipole, but with a beamwidth of 0.75 degrees using the 60 dB points. With 50 watts output, the effective radiated power is 55 quadrillion watts at the center of the beam (5.5 with 13 zeroes). As soon as the University realized what we had built, the entire project was taken away from us and turned over to the Japanese Self-Defense Forces.

Amateur radio "tinkering" has contributed to something, but I am not exactly sure what. I haven't the slightest idea what was in those wafers or how to explain how to build another set. But what I'd give to use a smaller set in the next CQ World Wide Contest! Do you think someone may be interested in this idea for Star Wars/SDI??

A few months later, the University contacted all of us and asked just how close we had been to the antenna when operating. As best as I can figure, we were in the null behind the array. From what has been said so far, it looks like a secondary use for our antenna may be as a mass sterilizer, but confirmation will have to await the results of the medical tests. If our antenna ever hits the market, it looks like remote operation would be desirable. As I am writing this, I have been informed that Suzuki-san can't fix everything after all. He's written off the 930 and 940, and I just found out that before the university terminated the project, they tried one more time with my FT-1000, but without the 100 dB attenuator to protect the receiver. It's front-end now matches the 940's and it looks like it will be awhile before I am on the air again. Maybe Yaesu will announce some new models soon.

Best 73, Joe Speroni AH0A/J1AAA, ex-Chief Engineer - TIARA 1 April 1994

This story has been reprinted and edited from the April 1992 issue of the Tokyo International Amateur Radio Association's newsletter.

Actually, Joe originally wrote the above back in 1985 and it has been updated by others since. Hope you enjoyed it. 73 de Sandy WA6BXH/TJ1ABV slay@netcom.com 1 April 1994

Since the first Oscar sent the message "HI" back in 1961, Hams around the world have been intrigued by space communications. Now in 1995, we have over a dozen amateur satellites circling the planet providing everything from two-way communications, packet store and forward message systems, to amateur television.

So how do you get on the satellites? With this edition of the newsletter, we will introduce you to the LEO's (Low Earth Orbit) satellite or "birds" as they are called. They are the easiest to get your feet wet with, and do not require a serious investment of time and money as would be required as if getting on Oscar 10 and 13 which are in high elliptical orbits.

LEO's - Low Earth Orbit Satellites

There are two satellites which are relatively easy to use and do not require specialized equipment to access. The flip-side of LEO's is that you only get a few passes a day and once in range, you only have ten or fifteen minutes to make contacts.

These LEO's are RS-10 and RS-12. All were carried as secondary payloads on Russian navigation satellite launches. They are easy to work through and will add to your amateur radio enjoyment.

The uplink (your transmit) frequency and downlink (receive) frequency for each satellite are as follows:

RS-10		RS-12	
Beacon 29.357	Downlink	Beacon 29.408	Downlink
Uplink 145.860	29.340	Uplink 21.210	29.420
.870 CW	.370		CW
145.880	29.380	21.225	29.425
.890 SSB	.390		SSB
145.900	29.400	21.250	29.450
Beacon 29.403		Beacon 29.454	

Please note that these frequencies are +/- doppler shift. The doppler effect shifts the frequency as the satellite is coming towards you, passes overhead and then travels away from you. So you will have to tune a couple khz above or below the above beacon frequencies to find the satellite's signal.

The doppler shift on RS-10 is the most pronounced. I find my downlink usually close to my transmit frequency when the satellite first comes over the horizon towards my location. Then during the pass, the downlink moves downward in frequency as much as 10 khz as the satellite moves away from my location. The procedure on this satellite is to maintain your downlink frequency. So expect to adjust your transmit frequency continuously during the QSO to stay where the other guy is.

On RS-12 the shift is less pronounced. Usually your downlink will be in a khz or so from your transmit frequency. With 15 meters up and 10 meters down, most hams can't

hear their downlink signal, so it is best to find a clear spot and call CQ. If answering a CQ, I usually put my transmit frequency a khz lower in frequency than the received signal and the station generally comes back to me. With any satellite, it is advisable to listen to several passes before transmitting. This allows you to get a feel for what the procedure is. Once your comfortable, let loose and call someone or call CQ!

The problem with RS-12 however, is that from 21.210 to 21.225 is the Extra Class subband and 21.225 to 21.250 is for Advanced licensed amateurs. So serious thought to upgrading is offered if you want to work through this "bird".

What do I need to work the Birds?

No fancy antennas, computerized rotators, sophisticated equipment, or high power are required to work these satellites. Your standard Ham radio station equipment should be good for one or more of these satellites. Note though, your downlink should not be stronger than the beacon signal. The passband of the satellite will become "swamped" if hit with a very strong signal and you will wipe out other stations (also you will lose a lot of friends!). Ten watts on CW or 25 watts on SSB will usually make the trip. Also, verticals work well for these LEO's. A beam antenna will certainly help when the satellite is close to the horizon, but once up 20 degrees or so, the vertical will do a good job. It's been noted that very high passes are difficult, as the satellite disappears into a null point overhead and you lose the signal.

But please, give the satellites a try. Listen to several passes.

When are the Satellites in range?

There are several computer programs which will help in planning your satellite operating program. The "keps" or orbital elements are published twice weekly and are found on some packet BBS or your on-line service. The computer program will take this information and give you a "real-time" display during the pass or print out pass information for the coming day or days.

Is owning a computer necessary?

Certainly not! But most ham stations now have a computer for logging and other functions. Check with the guys at the club, they will be happy to give you the latest copy of shareware and lots of advice on getting started. If you don't have a computer, ask around - because most satellite enthusiasts will let you know when the next "bird" is coming over.

To-be-continued....

APRS takes advantage of one of the unique advantages of packet radio, with automatic digipeating (digital repeating) of the UI, or unaddressed packets transmitted by an APRS station.

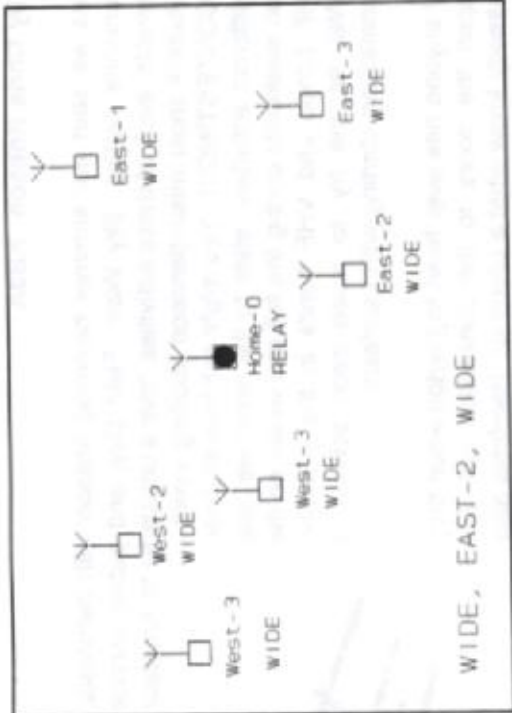
If you have spent a little time using two-meter packet in the area, you may have seen stations operating that don't seem to have regular amateur calls as their station identifier. Packet radio allows an alias in addition to your regular callsign, and by combining well-placed digipeaters with identical aliases, you can communicate over distances of greater than a hundred miles with a modest mobile setup.

A couple of examples, adapted from the APRS manual, are included here to illustrate the use of selective digipeating. In an APRS network, all the digipeating nodes have an alias of WIDE, in addition to their regular call. (This alias is restricted to well-place nodes, with high-elevation and broad coverage. This alias is not used by all APRS stations, or the digipeating scheme would break down). If you were planning a trip that would take you to the east, you could guarantee digipeating of your signal back to your home QTH by using an *unproto* path of WIDE, EAST-2, (in this example, right).

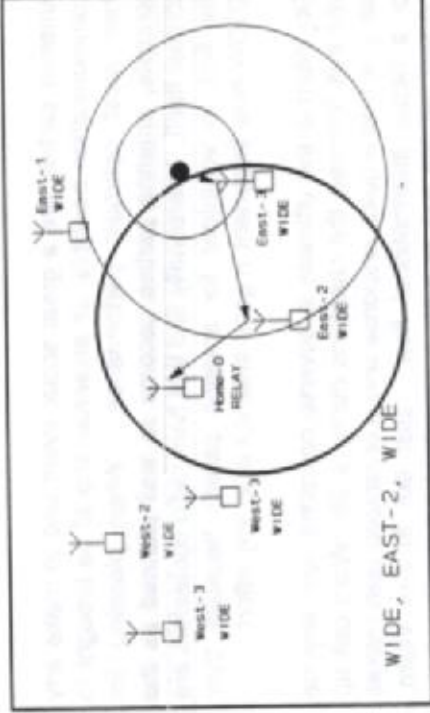
While within range of your home, your signal is picked up directly from your mobile unit. It is also retransmitted by any digipeaters in the area with an alias of WIDE.

As you move further from home, your base receiver (a scanner will suffice) is no longer able to hear you, but any one of three WIDE stations will. If the station receiving your signal is East-2 or East-1, then you will receive the digipeated signal at home directly from East-2. If you are out of range of East-2 or East-1, East-3 will respond using the ALIAS of WIDE, and retransmit to the station EAST-2. EAST-2 will then make a final retransmission of the signal to your home QTH, where your position will be automatically updated on your APRS map.

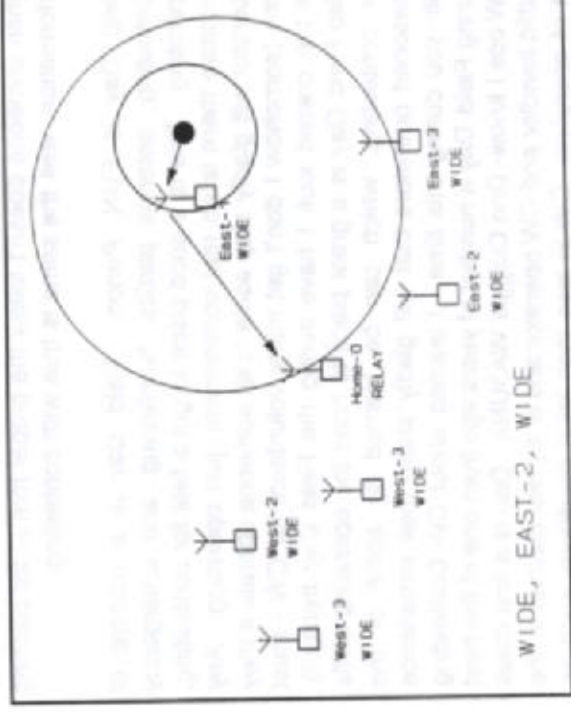
Now, if you've followed so far, you may be thinking "why not just use WIDE, WIDE as a path (or WIDE, WIDE, WIDE)?" The reason is QRM. Lets consider what would happen with a path of WIDE, WIDE, WIDE and a location within range of all three digipeaters EAST-1, EAST-2, and EAST-3. Each station will respond as a WIDE station, retransmitting the UI packet again with a path of WIDE, WIDE. Each station will receive two of these packets, again retransmitting with a path of WIDE, and again received twice by each station. If my calculations are correct, the original transmission will be repeated 15 times by the three digipeaters in the group, with 10 of those heard by your home receiver! Obviously, by putting a little thought into the best path to your desired location will reduce the QRM and make the network a lot more efficient.



WIDE, EAST-2, WIDE



WIDE, EAST-2, WIDE



WIDE, EAST-2, WIDE

NEW RADAR SYSTEM AIDS WEATHER FORECASTING NATIONWIDE BUT MAY PROVIDE LESS RADAR COVERAGE FOR SOME AREAS

(June 14, 1995)

NEWS FROM THE NATIONAL RESEARCH COUNCIL

WASHINGTON -- Weather forecasting in the United States will be substantially improved when the federal government's plan for replacing its older weather radar with the state-of-the-art Doppler radar is completed sometime in 1996, says a new report by a panel of the National Research Council.

However, there is potential for some loss in radar detection coverage, the report says, for localities where the decommissioned radar is not replaced and service is to be provided by a new radar located some distance away.

The National Weather Service's (NWS) new radar system will cover a much broader area of the country than the old system and will provide better and faster detection of weather events, including hurricanes, tornadoes, and flash floods, the panel said. For example, the new radar being installed are about 10 times more sensitive and, when all are in place, will be able to detect precipitation and other significant weather over 80 percent of the continental United States as compared with the 30 percent coverage of the previous radar. However, because radar-detection ability generally decreases with distance, there may be a degradation in coverage for the minority of localities that are substantially farther from one of the new radar than they were from the old.

This does not necessarily mean the Weather Service's ability to provide those localities with warnings or other forecasting services will be adversely affected, the report emphasizes. Replacement of older radar with next generation radar (NEXRAD) is only one component of the modernized system for providing weather services that the NWS gradually has been putting into place since 1985. Other components include satellites, automated surface observation equipment, and data assimilation supercomputers, as well as the human skills of observers, spotters, and forecasters.

The Research Council study grew out of concern by the U.S. Department of Commerce and members of Congress that the modernization program might actually degrade weather services for some areas as existing radar stations are decommissioned and as NWS field offices are relocated, closed, or restructured.

The panel recommended that the Weather Service examine

potentially vulnerable localities to determine whether a reduction in radar detection coverage will result in a loss in severe- storm warning and other forecasting services.

Among the geographical areas of concern identified in the report are northern Alabama, northern Indiana, northwestern North Dakota, northwestern Pennsylvania, and southeastern Tennessee. NWS also should determine the nature and extent to which its ability to provide storm detection and warning decreases as distance from a NEXRAD increases.

The panel did not attempt to determine whether the new NEXRAD system would in fact result in less effective weather forecasting for areas of concern. However, the report does provide the Weather Service with a set of general criteria for making such assessments. For each area assessed, NWS should:

determine the weather phenomena of particular concern such as tornadoes, flash floods, hurricanes, etc.

examine the relevant weather coverage maps provided in the Research Council report to see if radar coverage for the particular phenomena of concern in the region is reduced from what existed with the pre-NEXRAD radar.

assess the capability of the NWS system, as a whole, to provide weather service for the area and its impact on reducing risk to life and property. Some elements to be considered in this assessment are local weather characteristics, radar coverage, spotter network, and education and training of forecasters; adequate communications; and weather data from satellites and other sources.

If the Weather Service's overall assessment for an area concludes that warning services would be degraded, then there is inadequate radar coverage for the area, the panel said.

The report also examines the NWS plans to supplement its weather radar network with the 22 NEXRAD sites that the U.S. Department of Defense (DOD) operates in the



continental United States. At 15 of these sites, the military's NEXRAD coverage will be replacing older NWS radar that are being decommissioned by the Weather Service. There will be a degradation in radar coverage for the regions covered by these 15 military NEXRAD unless these radar are operated by the DOD as fully committed elements of the new NWS radar system, maintaining the same standards, quality, and availability as those operated by the Weather Service, the panel said.

The new Doppler weather radar being installed at many of the nation's commercial airports are regulated by the Federal Aviation Administration and are not part of the National Weather Service radar network. Since they are independent from Weather Service operations, the airport radar were not included in the panel's assessment of national radar coverage.

This study was requested by Congress and funded by the National Oceanic and Atmospheric Administration. The National Research Council is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering. It is a private, non-profit institution that provides independent advice on science and technology issues under a congressional charter. A committee roster is overleaf.

**Limited supplies of the report, Toward a New National Weather Service: Adequacy of NEXRAD Coverage, are available free from the Transition Program Office, National Weather Service, 1325 East West Highway, Silver Spring, MD 20910; tel. (301) 713-1090.*

[Internet availability: This announcement is available on the WorldWide Web at <http://www.nas.edu>; via Gopher at <gopher.nas.edu>; and via FTP at <ftp.nas.edu>.]

NATIONAL RESEARCH COUNCIL

Commission on Engineering and Technical Systems
Committee on National Weather Service Modernization

Panel on the Assessment of NEXRAD Coverage and Associated Weather Services

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