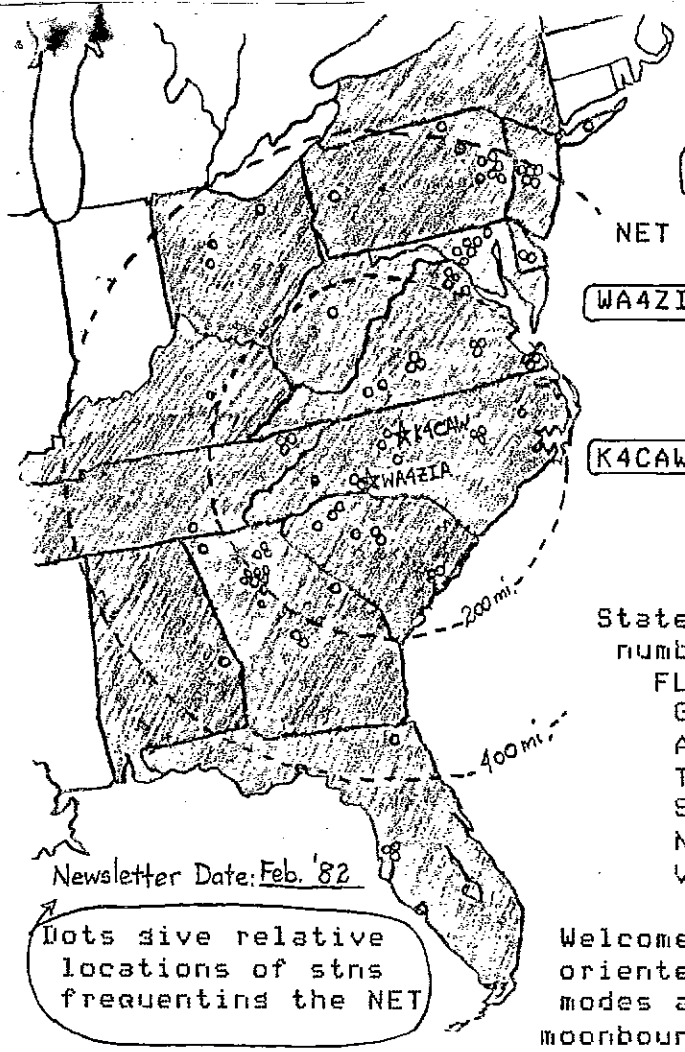


The EAST COAST 70cm NET

WEDNESDAY at 9:PM EST/EDT on 432.090 mHz

NET Control Stations

WA4ZIA	Dexter McIntyre POBox 544 Locust,NC 28097 ph(704)888-5039	four 19el RIW ant @90' PAG432 preamp @ant w/ .337dBNF, 2C39 driving RIW kw
K4CAW	Al Ross 2404 Springwood Dr. Greensboro, NC 27403 ph(919)292-3105	four 16el KLM @ 80' PAG432 preamp @ ant 30wKLM amp to ARCOS kw Echo 70

States represented thus far on the NET (approximate number of stations participating in NET follow)

FLA	4	MD	8	Statistics Fall '81
GA	15	WVA	1	number of different stn 57
AL	1	OH	3	" " states rep. 11
TN	4	DEL	1	Checkins for period 323
SC	8	PA	9	Average for 21 sessions 15.4
NC	12	NJ	5	for period 13 Aug-31 Dec'81
VA	12	NY	1	(data courtesy WA4ZIA)
		KY	1 (KC4EG march'82)	

Welcome to 70cm, Amateur Radio's most experimentally oriented band. A long list of surprising propagation modes await you in the form of: lightening scatter, moonbounce, satellites, airplane scatter, computer experiments, troposcatter, ducting, FAI, ATV, meteor scatter, etc. etc. Perhaps even new modes waiting to be found by you. Most hams have a concept of 432 mHz as being for very short range communications only, much like 2m FM. Nothing could be farther from the truth. It might surprise you to join in on the EAST COAST 70cm NET where 500 mile contacts occur year round without enhanced conditions. Often the NET spans distances of 1000 miles from end to end.

Covering the Eastern United States from northern Florida to New York the NET serves as a focal point for weekly activity on 432 mHz. The NET was started by Charles Osborne WD4MBK in the Fall of '79 at NC State University's VHF/UHF Project Lab (callsign W4ATC,NCSU ARC). The day and time were picked following discussion between WD4MBK, K2UYH, W3XO, W4FJ and others at the '79 Central States VHF Conference in Dallas TX. Following the fantastic openings in the '79 September VHF Contest, the NET was started while interest was still high and equipment had not yet been placed in the closet as seemed to often happen in winter. That winter it was found that poor activity in years past was the real cause of so called "poor" winter VHF/UHF conditions. Paths were actually more stable in winter, not feeling the tremendous swings in enhancement or QSB seen in summer. Range, while slightly reduced, was still hundreds of miles with typical equipment.

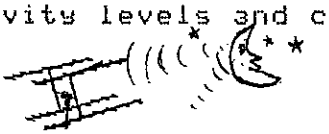
The NET has been, and hopefully will continue to be, a motivating force behind experimenters throughout the eastern US. In the past two years we have seen activity blossom many fold in the southeast. A catalyzing point was reached where station density insured available contacts most any evening. As most of us know, activity breeds activity and that is fundamentally one of the NET's key reasons for being. Come join us. You're sure to be pleasantly surprised.

As some of the Net members will note the newsletter is growing and has gone computerized. From now on we plan to publish a few hints to our newcomers on the band as well as comments on equipment, antennas, contest notes, etc. If you have something you'd like to share with the rest of us please write or call me: Charles Osborne WD4MBK,131 Saratoga Dr,Lawrenceville GA 30245 ph(404)923-6938.

PURPOSE and PROCEDURE for the East Coast 70cm NET

The NET serves many purposes. (1.) A concentrator of activity. These dependable signals each Wednesday allow evaluation of changes and improvements in station equipment. (2.)News of openings, experiments, or SKEDs between people of similar interests. (3.) A gauge of activity in various states. We count ALL stations on the NET frequency whether Q5 or not. This means many 10 watt stations can become part of the NET and ask questions etc. by relaying in via stations near them. They often hear the NET well and so are just as much a part of the evening's activity as anyone else. We are more concerned with an accurate measure of band activity than who is louder than someone else. Anyone who takes time out to join in is as much a credit to the band as the strongest of stations who join us.

The NET begins at 9 PM EST/EDT with calls to the southeast (Charleston SC). By 9:10 the NCS is beaming Florida. 9:20 Macon GA, Columbia SC, Auburn AL. About 9:30 Atlanta, Gainesville GA, northern AL, Miss. 9:40 looking West into western NC and Chatanooga TN. 9:45 Bristol TN, KY, Ind., Ill., southwestern VA, southern OH. 9:55 OH, WVa., Mich. 10:00 due North into western PA, NY, MD, and VA. 10:15 eastern PA, MD, NJ, D.C.,DEL,Long Island, RI, Mass, CT. By 10:30 the NCS has generally completed the full sweep and begins the backtrack counterclockwise for late checkins and additional information. 10:45-11:00 NET finishes. These times are +/- 10 minutes and of course depend heavily on activity levels and comments encountered in various areas of the NET.



Rules of the Road on 432 mHz

To provide for everyone's enjoyment a few common sense rules are generally agreed upon on 70cm. The National Calling Frequency on 432 SSB/CW is 432.100. Contact may be established on this frequency but should then be expreditiously moved up or down at least 5 kHz. Please take it from someone who has heard weak QSOs disrupted by the stations who all to often say "I don't hear anyone on freq so let's stay here." There almost always is something going on somewhere on the N'tl Calling Freq. If you've got to pick a frequency, don't pick the one freq. on a huge band where you will likely disturb others, particularly for across town QSOs. Another helpful hint for across town QSOs is to point your antennas away from each other into likely activity areas. Identify often and include your location, pausing a few seconds between exchanges for others who may be hearing you. All to often we've tried to break these crosstown QSOs to no avail. They are generally so loud to each other that it would take a pressure gauge to get a signal reading off their meters, yet they still point at each other. There's no telling how many openings are missed this way.

Other frequencies to avoid are the frequencies set aside for extreme weak signal work, such as EME, located generally from 432.000 - 432.050.
I shouldn't have to say it but, please stay off NET freq. 432.090 during the NET for local QSOs even if the NCS isn't looking your way. The NCSs are often confused by such stations. It also jams hundreds of square miles of people near them who are carefully listening for the NET. You have at your disposal one of the largest of Amateur bands. Use it with a little common sense and instead of enemies you'll make friends far and wide.

70 cm in 1982, What's in store for us.

With the coming of '82 we can all look forward to tremendous increases in band utilization. Each week new stations turn up across the southeast. It's your job and mine to show these newcomers that 432 is more than just OSCAR and across town QSOs. OSCAR will bring us many new faces especially with the coming high elliptical orbit satellite. This satellite will mean better than HF style QSOs to most of the globe and will likely be jam packed in less than 6 months.

Another long awaited happening under serious consideration by the FCC is the lessening of regulations on unattended beacons. Europe is full of beacons. As a result few openings are missed. Please write the FCC in support of this ruling. It could do wonders for experimentation and propagation studies in this country. They are reported to be planning to assign a certain slot of frequencies for the beacons. Let us all hope they ask someone who knows a bit about 432 band usage before doing this or we may end up with beacons at 439 or some equally difficult to reach section of the band (most current equipment covers 432-436). The best place for the beacons (personal opinion) would be 432.200-432.300. Comments?

Note: Currently this newsletter is funded out of pocket (which is why it comes out so seldom). Our generosity in regards to the "cause" (UHF activity in general) is not unlimited. A few postage stamps to WD4MBK (see p.1) will place you on the priority list. Next newsletters will likely be just prior to the June VHF Contest and again before the Sept. Contest. We hope to carry details of planned portable expeditions, SKEDs, and general technical tips and topics.

RIW 432-19s Available Again

George Flanagan, W2KRM, is once again producing the 19 el K2RIW antennas on a limited basis. What many of you may not realize is that it is virtually a one man show, so patience is in order. Write to :RIW Products, Box 191,Babylon,NY 11702 for details. Prices as of 12/1/81 were: $75 for the RIW 432-19; partial kit available (less boom, mast clamp, and N connector) for $27.95; 40 insulators for $4.25; and 42 stainless element retainers for $5. $2 shipping on the antenna

Our personal opinion is that this antenna is absolutely the best commercially available 432 yagi made. It is more durably constructed than even the KLMs. Gain vs size and weight is better than the F9FT 21 el. Weatherproofing of the feedpoint and consequent SWR performance (and gain) over a period of years is unequaled.

The only other antenna worth considering if the RIW 432-19 is out of your price range is the 15 el Quagi. While only as durable as the boom and loop mountins chosen, this antenna is hard to beat at less than $10 per copy. See the ARRL Radio Amateur's Handbook for details.

The Southeastern VHF Society

As our NET and general VHF/UHF activities have grown, so have the comments about the need for a unifying group here in the southeast. Many changes are taking place in our bands above 50 mHz, many chandes which affect the average VHF SSB/CW operator. Most of us are experimentally oriented and desire a cohesive force to help us exchange help and ideas with each other.

We are being convinced that the time is right to form the basis of a group much like the Central States VHF Society from the midwest. The CSVHFSoc. actually covers the whole country in its influence and membership, but appeals, generally speaking, to the most elite of hard core VHF/UHF/SHF experimenters. That in itself is excellent. A group of that sort can speak with authority.

We however have a golden opportunity to form a somewhat more grass roots level of society, to unify VHF interests specifically here in the southeast. There will undoubtedly be much helpful interaction between our two groups and other similar groups around the country. We all will have one goal in mind ! to increase the activity and enjoyment of our bands above 50 mHz.

CSVHFSoc. has several projects which we may be helpful in by searching out and correlating information. They publish an EME Station Directory and a listing of active 1296 mHz stations. They also recently took the initiative in offering several awards based on 1x1 longitude-latitude blocks as multipliers, much like Europe has long used to boost their activity. ARRL refused to lead the way in this country in backing the system but said they would follow if someone lead. We will publish an explaination and hints on such a system if its details are solidified for use in the ARRL VHF Contests.

Through the East Coast 70cm NET and this newsletter we have the basis for what could be called: "The Southeastern VHF Society". Initially we will be a survey and technical information exchange, based centrally in the southeast in Atlanta. This newsletter conveniently would cover the EAST Coast 70cm NET as well as the Southeastern VHF Society topics. Bringing both groups together via the newsletter is the obvious thing to do. It will serve to keep everyone appraised of happenings in VHF/UHF/SHF in general.

Since we are in the organizational state, what we need are a few sentences detailing where you feel such a group should direct its efforts. How much should dues be (send a few stamps in the interum to keep the information flowing between us)? Just guessing I'd say $4 would support a starting level of activities. Comments or critisism?

If you would like to be a part of the organization's beginings, drop us a letter expressing your ideas and support. Mail to WD4MBK at the address on p.1.

A Directory of Stations on 432

The list to the right is a summary list of all the stations who have checked in on the East Coast 70cm NET since its beginning in September 1979. Did I miss anyone? If so drop me a note and we'll add it to the computer file.

We are gradually compiling a very large and complete list of known 432 stations and their equipment, status, etc. When this becomes available we will send copies out to stations with sufficient postage on file with us. I estimate that the directory will contain over 300 stations covering most of the eastern half of the country. We can't of course guarantee full accuracy, but you can be assured that this will be a useful document (particularly on weak signals where you aren't sure of the call but have an idea of the location). Directory will likely be about 16 - 20 pages (approx. $.80 postage plus $.40 printing cost we think).

If you write us please include current details of your station, phone number (and whether or not to print the number in our directory), address, and possibly some of your specific hobby interests (EME, scatter, satellites, antennas, microwave magic, etc.).

Tips for the 70cm Operator

Stacking antennas can actually hurt your operating flexibility if done incorrectly. The best advice I could ever give you in this respect is to go for maximum beamwidth. Most stations today run four antennas in a 2x2 arrangement. This will take up only 5'x5' and be easy on the rotor. However a much overlooked method is the 4 high by 1 wide configuration. The thing most people don't realize is that this gives just as much gain, but leaves you with the same easy to point beamwidth as a single yagi. The vertical portion of the pattern is very narrow making it as difficult to point for EME as a 16 yagi 4x4 array. For Tropo though, try it you'll like it.

Also don't try to make one antenna do everything at the expense of your sanity. Ever tried to track OSCAR with an EME antenna? 432 antennas are tiny and easy to make so build antennas which suit their intended major use, be it EME, satellites, or tropo. Got a single direction where many stations are but they are very far away? Try a Laporte stacked rhombic. At 432 it can get tricky, but a 27dB gain, 5 degree beamwidth stacked rhombic is only 25' long and doesn't have to be very high off the ground.

Another neat trick giving a surprising improvement is putting the preamp and final antenna changeover relay up at the antenna. ANY loss ahead of the preamp degrades system noise figure and consequently the ability to hear very weak signals. It does far more harm than just a few tenths of a dB loss directly subtracted by the lossy part of the system. Moving the preamp and relay to the antenna can often give several dB improvement in signals. It is often as much improvement as doubling the array size. Think about that the next time you contemplate buying more antennas.

Watch out for preamps with bipolar transistors in them (MRF901, NE64535). These are recognizable by very wide bandwidth specifications. Often these preamps will overload your receiver with spurious signals from the local 460 mHz commercial stations. The GasFets now hitting the market in the $12 - $60 price range are by nature of their matching circuits very narrow band. They can handle much higher overload signals and do not require a lossy filter up front. This lets you take full advantage of their phenominally low noise figures (.85-.30dB NF in the respective prices above). Following is a preamp design by

Members of the NET as of January 31, '82:

WA4ZIA	K4CAW
W4ISS	WA4LDU
W4VHH	WA4SBC
WD4MBK	WD4CXU
W4ATC	W4FJ
WA2DPU	K2RIW
K2UYH	WA4GBE
WA4LBT	K4LNU
WA4QYK	K5ZRR
WD4SGW	W3OUX
W3IP	W3HQT
N4CNN	W4USW
K4KAE	K4GL
WA4OYH	WB4NMA
WB4IZR	WA4NJP
WD4IIS	W3XO
K4GMJ	N7BO
W4GJO	W2GU
W4ZPG	WB4GTB
W4DJD	W5HUQ
NI4Z	W4HGM
WB4HIE	N4IF
WA4GVE	K2KFE
WA3EOQ	W4FMN
N4CD	K4QKR
K2GOX	WD4MUO
WD4EXH	WB4EXW
K4FKV	W3LUS
K3LFO	K3HZO
W4HJZ	WA4PGI
WA1NGR	AA4OO
K4QIF	WD4LGR
AB2Y	K3ARN
WA4CBX	WB3CZG
W3IY	AB4L
WA3NZL	W3OZ
K3QCQ	W8UT
KB8RQ	K8WW
WA8ZHE	W3ZZ
W3RUE	N4DT
KM4K	W2KFC
W3IWP	WB3LJK
K4NTD	WA4CQG
K4AGV	W4NFR
K3HCE	W3CGV
WB2SZK	N3DA
W3DBK	WB2RJL
W8DJY	

93 Stations in 14 States!

these and was amazed at the incredible sensitivity possible with it. I copied many EME stations with it using only a pair of 21 element F9FTs. A cheaper version of the NE21889 is the NE72089. It is supposidly the same device just with wider specification variations possible. It is still a tremendously low noise device and probably the buy of the year for $15 plus a $5 order handling fee. These devices currently have about a 60 day lag in shipment due to short supplies of them in Calif. They are available through California Eastern Labs Inc., 3005 Democracy Way, Santa Clara, CA 95050. (408)988-3500

Before placing any preamp inline (especially something as costly as the GasFETs) a few tests should be made to find out if the preamp will survive in your system. Provision must be made in the sequential biasing of the amplifier to insure that all Transmit/Receive relays are switched and stable prior to application of power. Switching hot on 432 can destroy good relays as well as preamps. Any arcing in the relays due to hot switching will cause losses to concetrate in the relay, immediately destroying the temper in the spring portions of the contacts if not worse.

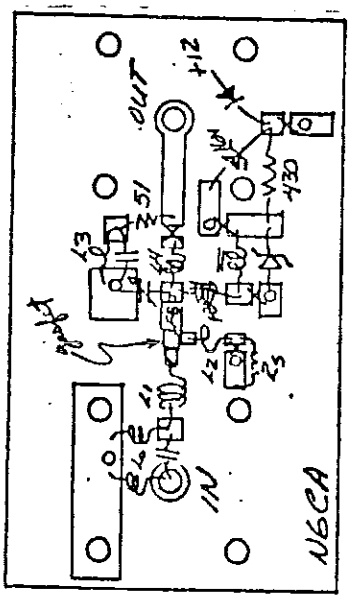
Good transmit/receive isolation is an absolute requirement if you intend to run any kind of power at all. Many relays while good at HF are terrible at UHF. They oftem provide only 30 dB of isolation between the preamp input and the amplifier on transmit. That means if you are running a kw that you'll put 1 WATT into the input of the preamp smoking it nicely. The goal is about 60 dB isolation even if it takes two relays to get it. Remember however that any losses ahead of the preamp, even tenths of a dB, will seriously degrade the noise figure of the system. Find the lowest loss, highest isolation relay you have for use ahead of the GasFET.

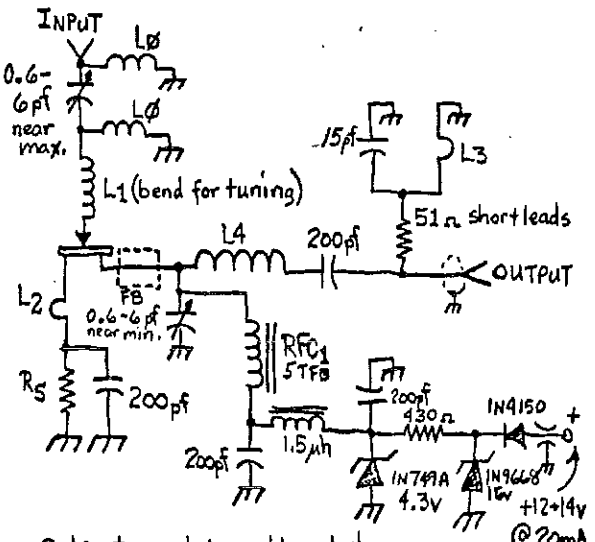
If using two relays you may want to set them up to short the input of the preamp during transmit. Check to make sure your preamp can withstand a short on its input without oscillating. The reason for using a short instead of 50 ohms is to prevent damage during listhening storms where 50 ohms may as well be 50000 when speaking of the currents in lightening.

432 mhz Ultra Low Noise Preamplifier

By E.R. 'Chip' Angle, N6CA, 25309 Andreo Ave., Lomita,CA, 90717.

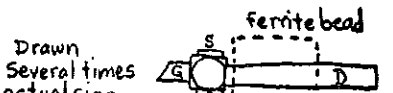
Noise Measure with NE21899 **0.3-0.4 dB, Gain 16-17 dB.** Rtn loss typ 20 dB in/out. Board material not critical, suggested G-10 fiberglass double sided copper. Connectors for best noise figure should be SMA or type N. (If you have to use a handful of adapters, you may as well use BNC as you'll probably end up with less loss and better performance.) Use best available low loss UHF rated components such as chip capacitors, 1/8 watt resistors, 400 mw zeners, miniature piston trimmers, etc. Reverse and overvoltage diodes should NOT be omitted!





O denote eyelets soldered thru ground plane. Ferrite bead should be recessed into a cutout.

Carefully shorten notched Gate lead to 0.10" as shown. Shorten source lead to 0.10" length. Remove other source lead. Do NOT cut Drain lead.



NE72089 OR NE21889 for best possible noise figure.

RFC1- 5T #30 GA on FB core
FB Ferroxcube 56-590-65/4B
LØ-3T #24 0.110" dia.
L1-5T #24 0.156" "
L2-1T #24 0.110" "
L3-1T #24 0.125" "
L4-5T #24 0.125" "

D432 MGF-1200 MGF-1400 also usable

Measure source voltage to verify Ids of 12 ma. Change Rs to get proper current. 30-51Ω typ.

A final comment on the newsletter: Please feel free to copy the newsletter for friends and distribution as free info for VHF/UHF oriented dealers at hamfests. It helps their business by showing that there is activity on **70 cm**, a lot of it. That also helps us find new people and diversify our interests on 70cm. **WD4MBK** 13.