Extract from the SERA

The 900 Band: There's still time to do it right!

by **Vester Scott N8EKA**
Georgia Asst. Director

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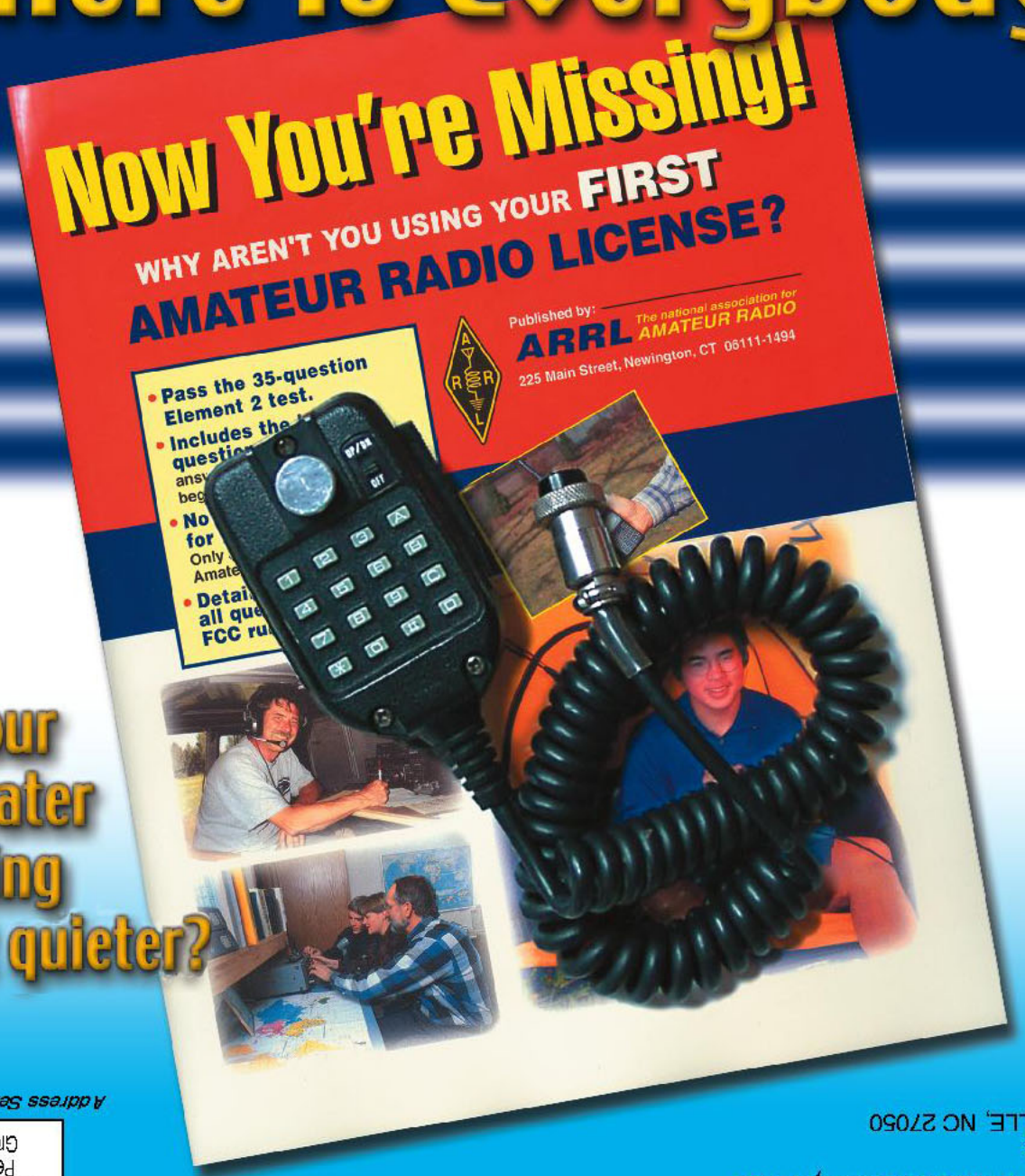
Where Is Everybody?



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Providing voluntary frequency coordination for Amateur Radio repeaters in Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia

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SERA Membership

Full Repeater Membership

(A Membership for Repeater Owners & Sponsors)

Any repeater owner or club may join SERA as a Full Member if they have a properly coordinated and operating repeater on the air. A Full Membership application, coordination information (if not on file), and the correct membership fee should be submitted.

Two individuals representing the full member repeater, named and listed on the application by the owner, receive the *Repeater Journal* each quarter.

The two Full Member Representatives have voting privileges in SERA elections and may be eligible to hold elective offices within the organization. The full member repeater is also recognized as a SERA supporter in the repeater index with a ☺ symbol. A Full Member application is available in this issue of the Repeater Journal, and on the SERA web site: **www.sera.org**.

Full Member dues are $20/year, pro-rated by quarter. All full memberships expire on December 31st of each year.

Associate Membership

(A Membership for Repeater Users)

Amateurs Radio operators, especially repeater users, are invited to join SERA as Associate Members. Only $8.00 per year will enable you to support the organization and receive the *Repeater Journal*. Associate Members may hold appointive offices within SERA, but do not have voting privileges.

Associate Membership begins in the quarter you join, and dues are not pro-rated. Renewals are due in the same quarter in subsequent years.

Repeater Journal Mailing

The *Repeater Journal* is mailed Bulk Rate during the first week of the cover date. Delivery takes one to two weeks. Notify the **editor** if you have not received your copy by the 1st of the following month. **The Journal is *not* forwarded to new addresses. If you move, send your new address to the editor!**

SERA Summer Board Meeting

Associate member dues increase (a little)

The SERA Board of Directors voted to increase Associate Member dues from $8 to $10 per year, effective January 1st, 2004. Board members had to think hard to recall the last dues increase - it was 1993, when dues went from $6 to $8, which means SERA has gone 11 years without an increase.

The Board was acting on information from *Repeater Journal* editor Gary Pearce KN4AQ, who said that advertising revenue was down a little, and expenses were up a little, trends that he expected to continue.

The cover price of an individual copy of the Journal will increase to $4 beginning with the November 2003 issue.

The Board decided not to increase full-member dues for the time being, but will revisit the question at next winter's meeting.

EDITOR COMPENSATION

Pearce provided another reason for increased *RJ* cost: he asked to be paid to do it. He said that editing the Journal took 80 to 100 hours per issue, time that sometimes conflicted with the needs of his clients (Pearce is a free-lance audio and video engineer). He asked for an amount that was "a lot less than the work would cost commercially, but enough to mean something."

The question stirred considerable discussion and debate. SERA has paid for some clerical help in keeping repeater records, but otherwise all other positions are volunteer, from the Officers and Directors to Frequency Coordinators and *Repeater Journal* authors. Many of these jobs also require considerable time and effort, with skills equal to paid positions at companies.

In the end, the Board decided to consider the *Repeater Journal* editor position as an individual case, and approved Pearce's request for compensation effective January 1st, 2004. The vote was not unanimous.

ONLINE SERA MEMBERSHIP

Becoming a SERA member, and renewing membership, will become easier for those who willing to do business over the Internet. After presentations by Pearce and GA Asst. Director Rick Wright W4LOC, SERA President Don Williams W4VT appointed Wright to chair a committee to look into setting up on-line membership. The committee made a report by e-mail in July, and the Board approved plans to proceed. Details are not available at press time, but within the next few months, the SERA web site should contain a secure page for membership transactions using a credit card.

That will be nice, but nothing beats in-person contact. SERA staff will still appear at many hamfests, and you'll still be able to join and renew membership there.

OFFICER NOMINATIONS

President Williams also appointed a nominating committee to recommend officers for the next two years. The positions of President, Vice President, Secretary and Treasurer will be up for election. The committee's recommendations will be published in the November *Repeater Journal*. Nominations will also be open "from the floor" from any full member, and a nomination form will be included in the November issue.

900 MHZ PLAN PROPOSED

VA Asst. Director Vester Scott N8EKA presented a plan for modifying the 900 MHz band plan. His proposal would simplify repeater coordination and use of existing surplus commercial equipment in the Amateur 900 MHz band (no equipment is currently manufactured specifically for Amateur Radio use).

The Board took no action on Scott's proposal, but details are presented in this issue of the Repeater Journal, and we invite member comments.

STATE REPORTS

Reports from each state Director indicate continued slow growth. Some coordinators have been a little busier than others. Most action is on the 440 MHz band, but a few two-meter repeaters are still being squeezed in here and there. North Carolina now has more repeaters coordinated on 440 than on 146, for the first time ever in a SERA state.

PERSONNEL

There were no personnel changes at the meeting. In an e-mail vote before the meeting, the Board approved MS Director Steve Grantham's appointment of Harold Bullard K5WHB as a new Assistant Director for Mississippi. There's more info in Charlie Diamond's *Mississippi News* column in this issue of the Journal. By the way, Steve is sporting a new callsign: N5DWU is now AA5SG. Congratulations, Steve!

COMSTUDY

Saturday morning training once again focused on SERA's new ComStudy program. NC Vice Director Frank Lynch W4FAL reviewed the details of this complex program that allows coordinators to more accurately predict repeater coverage and interference potential based on real-world parameters. Lynch said that he has been able to get some previously uncoordinated repeaters to qualify for coordination based on results of ComStudy predictions.

The SERA Winter Board Meeting is scheduled for January 10, 2004, in Pigeon Forge, TN. ■

ComStudy Study:
above - Alex N8FWL gets some one-on-one from Frank W4FAL (notice Frank's new beard!). Right - Jeff W4KMB watches Frank's presentation with a graphic demonstration on his notebook computer.

Frank reports a brisk "can you check my repeater coverage" business at hamfests. Enterprising RJ editor KN4AQ suggests "Sure. $5 a pop."

The 900 Band: There's still time to do it right!

Please note that this article is a proposal by the author. It is not SERA policy at the time of this publication. The SERA Board is considering the proposal.

Vester Scott N8EKA
Georgia Asst. Director

The 33 cm (a.k.a., "900") amateur band, covering 902-928 MHz, is approximately 20-year-old news, but lately there's been a resurgence of interest in its FM repeater segments due to the increasing availability of a wide range of usable and affordable surplus commercial FM radios.

The thing about 900 that appeals most to this writer is that it attracts only *real* hams. If you're on 900 you're probably technically oriented or inclined. Period. Appliance operators need not apply. 900 MHz may also be the highest usable frequency for good, solid FM mobile amateur communications without excessive "picket-fencing".

In this article I hope to accomplish four things related to this great band:

- Outline some of its benefits
- Briefly identify some of the equipment available for it
- Present some of its inherent challenges, and attendant solutions
- Get more hams working together to define its future

THE SERA 900 BANDPLAN

The SERA 900 bandplan, at **www.sera.org/900.html**, is an excellent piece of work that covers all the bases. Most of the active and aspiring 900 band hams around the country appear to agree on this. The bulk of any existing *disagreement* centers on two things:

- Choosing 12 MHz, 25 MHz, or both as standard national repeater splits
- Defining a common national calling frequency.

Among the thirteen existing 900 repeaters in SERA territory, 12 MHz splits are currently being used only in GA, NC, TN, and VA, while 25 MHz splits are being used only in GA, KY, and NC. There are no 900 repeaters in MS, SC, and WV.

12 MHz split: Most of today's existing 12 MHz split 900 MHz repeaters were the first on the scene when this band became available to amateurs. These were built laboriously from the ground up, typically using crystal controlled GE-Ericsson mobile radios that were far from plug-and-play. These radios were initially available to hams only in certain areas around the country, where they had been sold and used but later became surplus due to upgrades, FCC band changes, etc.

25 MHz split: Synthesized 900 radios suitable for 25 MHz splits essentially came along later. Hams were quick to take advantage of two vital characteristics of this new proliferation of radios:

- They would be available on the surplus market for years to come
- The inherently easier low loss isolation achievable in duplexers having a 25 MHz split versus a 12 MHz split.

Maybe, in a perfect world, we'd only have one split and one national calling frequency to deal with. However, just because it didn't work out that way doesn't mean we can't all agree upon a plan "B". I'll come back to this.

AVAILABLE EQUIPMENT

There are a number of ways to go when selecting FM repeater and simplex equipment for the 900 band, depending on your interests and pocketbook. The Yahoo AR902MHz group is a great place for repeater builders and users to get their bearings and to proceed with confidence. The Yahoo Repeater and Repeater-Builder groups are also excellent general resources for repeater builders on any band. It's been my experience that the owners and trustees of existing 900 repeaters are also willing "Elmers". In the following I've identified additional resources.

Store-bought: If you're an incorrigible appliance operator, the 900 band may not be for you yet. Exceptions:

- Plunk down some serious, but well spent, money and add one of DownEast Microwave's excellent 900 transverters ahead of your existing 440 FM radio. I'm pretty sure you'll be able to accommodate most (probably all) of the SERA 900 bandplan splits in this manner if your 440 radio can define 25 MHz and/or 12 MHz splits.
- Consider a wired or kit 900 MHz transmitter and receiver from Hamtronics
- Wait for one of the ham radio manufacturers to come out with a transceiver that includes the 900 band. While they may never see a market for a hard-core, dedicated 900 radio, they will certainly add 900 to a 440 or 1200 MHz model sooner or later.

Not quite store-bought: Another option that is *essentially* plug-and-play is to find a surplus 900 band commercial radio that is good to go with only reprogramming (i.e., no circuit/hardware mods required). The radio that I'm most familiar with in this category is the Motorola Maxtrac GTX 900 portable (a.k.a. HT). However, there are other mobile and HT brands/models out there that will work with programming only (no mods).

Modified commercial radios: Surplus commercial radios that may be modified (and programmed if necessary) for use in 900 band repeater or mobile/base applications are readily available. Most of my 900 radios have come from eBay, for example.

GE-Ericsson crystal controlled 800 MHz and 900 MHz radios (if you can find them) may be modified for 900 band operation with a 12 MHz split. Check out the **www.rtzaudio.com/kg4lne/phoenix.htm** web site and the Yahoo GE group for more information.

Kenwood TK-931 and other 900 radios are synthesized, and work with a 25 MHz split. There doesn't appear to be a Kenwood Yahoo group or dedicated web site for these yet, but the Yahoo AR902MHz group mentioned earlier has a grip on it.

Motorola 900 MHz Maxtrac, Radius, and GTX models are all synthesized, and are always (to the best of my knowledge) modified for a 25 MHz split. Also, some Maxtrac 800 MHz models may be modified to work very well in repeater Rx (input) applications in the 902-903 MHz region, but cannot be made to transmit or receive in the 927-928 MHz range due to inherent VCO limitations. The **www.batlabs.com** web site and Yahoo Motorola and Motorola-User groups will swiftly make you a Moto 900 radio expert.

E.F. Johnson produced several 900 MHz models that may be modified fairly easily for a 25 MHz split, plus an 800 MHz model that can be coaxed to 902 Rx for repeater input use. Check the Yahoo **efjmultinet** group.

LETS TALK ABOUT PROGRAMMING

The back side (more literally, backside) of nearly every approach to coming up with 900 FM amateur radio equipment, save the aforementioned transverter approach, is that you will need to either get someone who possesses the appropriate software and (perhaps) the interface cable/circuitry to program it for you, or else invest in the where-with-all with which to do it yourself. In other words, none of these radios except the crystal-controlled ones are technically

"user-programmable", per se.

Typically, the necessary software must be purchased at a cost of $250-350, and is strictly licensed. Who has it? Dealers and service shops, for sure — and they'll usually charge you a very reasonable $25 or so to program a radio to your specs. If you can find another ham (a 900 repeater owner, for example) who has already made the software investment you can probably negotiate a freebie.

I've also heard that there are a few ne'r-do-wells out there, with shady copies of the programming software, who will do it as a favor. Shame on them!

In all seriousness, this is an honesty/ethics/good-common-sense issue for all of us, and I do not wish to make light of it. I suspect, however, that commercial companies are much more interested in busting those who would try to turn a profit on unlicensed software than hams who instantly rush to battle in the public service during any communications emergency. (There — that oughta' hold 'em off, ya' think?)

"SYNTHESIZERS RUINED 2M"

I raised a few eyebrows with this comment recently in a 900-band presentation to the SERA staff during our Summer 2003 meeting in Pigeon Forge, TN. I didn't mean it literally, of course. Synthesized FM radios were a wonderful addition to ham radio. What I really meant is that the lack of proactive repeater coordination caused the problems. Sometimes I leave out a chapter or two between sentences.

When the first 2-meter repeaters became available, every radio in the world was crystal controlled. (My favorite was my noble old 12-channel Regency HR-2a, which I still have.) The first repeater in town was always set up on 146.94; the next one took 146.67, and so forth. If you were far enough away you started over with 146.94. You get the idea. Don't hold me to these exact pairs, but that's very close to the way it went. Everybody cooperated, and life was good. PL tone was neither required, nor even thought of.

Alas! Along came the first crop of synthesized, user-programmable, memory-intensive 2 meter radios from the "Big 3" that extended to mobile/base FM a new total frequency agility that seemed to be the answer to every problem (most of which didn't actually exist yet, but shortly would in an unfortunate unfolding of events). From this point on it was seldom necessary to plan and think about repeater pairs logically; if there's interference, just change the frequency pair, tone, or both.

The entire USA is now floundering (nay, drowning) in the ensuing morass of 2-meter repeaters over the subsequent years leading to the present. For example, there are presently 1150-1200 2-meter repeaters in the eight SERA states alone, using combinations of 85-90 different repeater pairs and over 25 different PL tones. It now takes a bushel basket full of programmed-in repeater pairs and PL tones to communicate while traveling cross country any significant distance. One could have the same pair programmed in ten memory locations with different PLs, and still not have the right PL for a repeater a hundred miles away using the same pair.

If one projects the above numbers on a square mile basis the result is an estimated (I didn't actually count 'em) 12,000 2-meter repeaters currently in operation across the USA, all using repeater pair/PL combinations similar to the ones shown above.

Even with today's multi-channel synthesized radios it would be difficult to impossible to program into one radio enough 2-meter repeaters at once to enjoy continuous repeater communication even while traveling within the eight SERA states alone. And this doesn't even begin to consider the other PITA issues, like trying to even FIND the right repeater in memory once it's programmed in.

On the other hand... uninterrupted and zero-interference cross country 2-meter mobile repeater operation could be easily accomplished anywhere in the USA today with only four to six different frequency pairs and a single PL tone, had there been some organized, proactive coordination in the beginning. Unfortunately, we couldn't (or at least, didn't) predict that then—either on 2 meters, or on any VHF and UHF band that followed.

Now, however, we are faced with a new challenge and attendant opportunity to do it right — on 900. It is virgin territory. No insurmountable existing barriers to a proactive approach. How might we handle it?

Read on.

CURRENT 25 MHZ SERA BANDPLAN

If you check out the SERA 900 band plan you'll discover the following 25 MHz split pairs and simplex frequencies. This is well nigh unto perfection, with the possible exception of the two simplex frequencies specified. 906.5000 simplex will not work with most available 25 MHz split radios due to inherent, insurmountable VCO design constraints, and 927.7500 is not being actively used anywhere in the USA that I am aware of.

Input/Output	
902.4875/927.4875	902.6125/927.6125
902.5000/927.5000	902.6250/927.6250
902.5125/927.5125	902.6375/927.6375
902.5250/927.5250	902.6500/927.6500
902.5375/927.5375	902.6625/927.6625
902.5500/927.5500	902.6750/927.6750
902.5625/927.5625	902.6875/927.6875
902.5750/927.5750	902.7000/927.7000
902.5875/927.5875	902.7125/927.7125
902.6000/927.6000	902.7250/927.7250
	902.7375/927.7375
Simplex:	
906.5000 (National)	927.7500 (SERA)

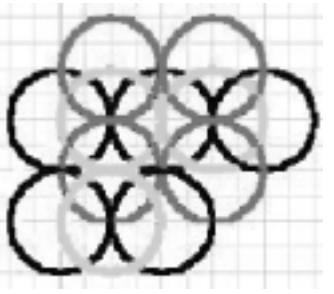
SUGGESTED 25 MHZ BANDPLAN

Below is shown what I recommend for consideration as an alternative to the current SERA 25 MHz split 900 bandplan, and possibly as a candidate component of a new *National* 25 MHz split 900 bandplan that would be acceptable to all.

What you see is an example arrangement of standard SERA 900 bandplan 75-mile-diameter circles, each of which defines the official interference boundary of a coordinated 900 repeater.

Imagine the repeater circles as follows:

black = 927.4875(-)
light gray = 927.5125(-)
dark gray = 927.5250(-)



If an additional pair is absolutely needed beyond this, it would always be the next one in sequence, with no exceptions. All would use PL 100.0.

Note that I've skipped 927.5000(-), which would be eliminated from the frequency pair pool, allowing 927.5000 to assume its hard-earned and rightful role as the official (rather than merely the solidly entrenched *defacto*) national simplex calling frequency. In short, it would be grandfathered.

All existing 902.5000(-) repeaters would also be grandfathered if the owners could not be convinced to change frequency. Their coexistence within the new bandplan would still be peaceful and uneventful.

Fifteen repeater pairs would still remain as a wonderful repeater or simplex playground for others on a local basis, using any (or no) PL tone, as they choose.

Finally, let me hasten to admit that what I'm showing here is clearly an idealized example. However, actual paper plots in several of the SERA states predict that it is also very viable from a practical standpoint. I invite all to challenge me on this important point.

There is a *caveat*: A vital key to the success of this proposal is the unrelenting proactive assignment of successive coordinated repeater pairs, beginning with the lowest pair, as shown below. This approach will prevent the aforementioned "synthesizers ruined 2 meters" syndrome from ever trashing the 900 band, but will not compromise the band's effectiveness. This is the way it would look:

Proposed 900 MHz Bandplan

Input/Output	902.6125/927.6125
902.4875/927.4875	902.6250/927.6250
902.5000/927.5000	902.6375/927.6375
902.5125/927.5125	902.6500/927.6500
902.5250/927.5250	902.6625/927.6625
902.5375/927.5375	902.6750/927.6750
902.5500/927.5500	902.6875/927.6875
902.5625/927.5625	902.7000/927.7000
902.5750/927.5750	902.7125/927.7125
902.5875/927.5875	902.7250/927.7250
902.6000/927.6000	902.7375/927.7375

927.5000 (National)

Based on what I've discussed so far, my geometry and math calculations have produced the following approximate results for several idealized scenarios, where the interference boundary for each adjacent repeater is defined by (R = 37.5 miles). Please also refer to the earlier illustration to understand the progressive superimposition required to achieve a theoretical 98% coverage:

Square Miles	Coverage (%)	Rptrs. Req'd.
393,750 circle	78.5	70
(arbitrary 10x7 arrangement)	95.1	124
	98	187
341,260 (eight SERA states)	98	162
3,537,441 (entire USA)	98	1680

TOTAL USA COVERAGE WITH TEN CHANNELS

The whole idea here, of course, is to find a way to get by for mobilin' and simplex anywhere in the USA, using the ten channels maximum available on a typical converted commercial 900 radio. Here's just one of several possible programming approaches for achieving that, provided we first get all of the repeaters right.

Ch	Rptr. Rx	Rptr. Tx	PL
1	902.4875	927.4875	100
2	927.4875	(repeater output/simplex)	100
3	902.5125	927.5125	100
4	927.5125	(repeater output simplex)	100
5	902.5250	927.5250	100
6	927.5250	(repeater output simplex)	100
7	902.5375	927.5375	100
8	927.5375	(repeater output simplex)	100
9	927.5000	(National simplex)	(none)
10	(wildcard)	(wildcard)	(wildcard)

Maybe the Ch. 10 "wildcard" in the above chart should actually be programmed the same as Ch. 9, but with PL 100.0 added? This could be used to clear the calling frequency but continue the QSO. I don't know — you tell me.

WHAT ABOUT 12 MHZ SPLITS?

No problemo. I've merely used 25 MHz splits in this article as an example. Handle 12 MHz splits exactly the same way. Repeaters using the two different splits will never be aware of each other. As explained earlier, you'll probably need two radios to cover both splits — but that looks even *more* impressive under the dash. In fact, with two radios, one might be able to fill in coverage gaps usefully in some areas. I have no strong feelings either; it's just that I was "born and raised" on the 25 MHz split.

WHY THE PL 100.0?

Since hams share the 900 band with a lot of other non-ham stuff (including those pesky cordless phones), this minimizes (and usually eliminates) the problem. I do strongly feel that PL should be eliminated for national simplex frequency purposes, however, for maximum ability to initiate/respond on that frequency.

ANY GOTCHAS FOR REPEATER OWNERS?

For new repeaters: None that I can think of.

For updating existing repeaters: To adapt an existing 900 repeater to the new plan you may need to

- Retune duplexers, bandpass filters, etc.
- Reprogram or re-crystal Rx/Tx
- Re-coordinate
- Get your current users to switch to the new repeater pair.

BAND CHARACTERISTICS

In my experience with 900 FM mobile and base operation, the band characteristics are about the same as for the 70 cm band. On the other hand, it's theoretically possible to achieve twice the gain with the same antenna length.

In-band competition: Many 900-band ham repeaters are forced to compete with commercial 900-band cell equipment (paging, etc.) that may be located only a few feet away. Good old ham ingenuity and filtering usually deals with this successfully, leaving the 900 mobiles and base radios out there to deal only with an occasional 900 cordless phone in the local neighborhood. I have not yet found this to be a showstopper, and the situation appears to be improving.

HOW DO WE MAKE IT ALL WORK?

Well, maybe we could initiate some dialog:

- Get everybody (ARRL, NFCC, coordinating bodies, repeater owners, repeater users) on the same page
- Coordinate proactively
- Possibly use a supplication like the following to "re-orient" new repeater builders who attempt to stray from the "plan":

Dear (applicant): The (Frequency Coordinating Body) acknowledges your request for coordination of a (Out/In/Tone) repeater at (lat-long). Rest assured that such a coordination request appears to meet all (coordinating body) requirements, and will likely be granted if you prefer it. However, we'd like to offer an attractive alternative. As you are surely aware, most 900 MHz transceivers used in mobile operation are modified commercial radios and have a limited number of available frequency channels. These channels must be programmed by someone (typically a shop) who owns a programming interface and a legal copy of the programming software. Changing channel frequencies always required reprogramming. On the other hand, a (out/in/tone) repeater pair at your proposed location would provide significantly more efficient use of the 900 bandplan and would better support the (Coordinating Body's) long term objective of enabling continuous coverage for mobiles using 900 while traveling cross-country in the USA. Please review the enclosed diagrams, which show how efficient this plan would be.

Thanks, (Coordinating body)

THE FUTURE OF 900

Gary KN4AQ, *RJ* editor, asked me recently if I thought 900 would ever be more than a niche band. My honest answer to his question would have to be, "I hope not!" I'd like to see it exploited only by serious hams whose primary interest is the advancement and enjoyment of the technology of ham radio. A cut above the status quo, but still short of waveguides and horns. Neat playground.

THERE'S STILL TIME TO DO IT RIGHT

In a nutshell, I'm asking the RJ readers if cooperation is possible between repeater coordination bodies across the USA, so that hams can get the maximum enjoyment out of 900. For example:

- Shouldn't the coordinating process and guidelines for the 900 band be exactly the same everywhere in the USA?
- Can committees from each of the coordinating groups across the USA (including SERA) meet with each other to talk and listen?
- Can we all forget about whose idea something was or who thought of what first. Who cares?
- If we can't all agree on a single bandplan, shouldn't we all just treat 12 and 25 MHz splits the same as we would treat separate bands, and simply use two different extremely affordable 900 radios in our mobile or base installation?
- Could we then not expect the ARRL, NFCC, and FCC to deal with all 900-band controversy, bureaucracy, rules, and enforcement, leaving SERA and the other coordinating bodies to concentrate on coordination?

BOTTOM LINE

Please take another look at our 900 FM band in light of what I've presented here, and decide whether it makes enough sense to pursue this further, or if we should simply let nature take its course.

If you feel we should grab the bull by the horns, then let's join forces to flesh out this delightful band resourcefully as we move through the future.

Either way, I'm very interested in your comments (including any errors you may have spotted), and your opinions. If you want me to write more about 900, let me know that as well.

-Vester N8EKA

Georgia

reported by
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Is it July already? I really enjoyed the Memorial Day holidays at the annual Scott family reunion in MO (You're right, I should have been home wrapping up this column).

SERA AT GAINESVILLE

The **Lanierland Amateur Radio Club** (LARC), plus the GA 14C (communications) and Cleanup/Recovery components of the **Southern Baptist Convention Emergency Relief** team, pulled together a record-setting Gainesville hamfest for the weekend of 7/12. GA 14C handled repeater talk-in. A LifeSouth bloodmobile joined the hamfest, and did a good business from the parking lot. Jeff W4KMB and I ran the SERA table. By the way, Terry W4TL is the LARC president.

ARES REPEATER NETS

A reader has suggested that I include Georgia ARES info in the RJ. This is pretty important stuff now, since the ARRL and the DHS signed a *Statement of Affiliation* at Ham-Com in Arlington, TX in June. One of the several forums presented at the Gainesville hamfest, in fact, was an excellent ARES presentation by Mike Boatwright KO4WX, Georgia Section ARES Emergency Coordinator (EC). So please send me any repeater-related ARES news and updates via email (preferred), phone, or snail-mail and I'll try to weave it into this column.

That said, just an hour ago (no lie) my pager sounded an ARES severe Wx warning and net alert, reminding me once again just how important repeaters are to ARES and Skywarn operations. I took a break from working on this article to join the net and report my local Wx situation as it evolved. Though it turned out to be just a passing T-boomer in the Lawrenceville area, some parts of northern GA (including some mountaintops where ARES-critical ham repeaters are located) got smacked pretty hard.

Let me suggest that you make sure your ARES repeater net listings on their respective web sites for each county are up-to-date. Report any problems to either your EC or the webmaster. While one might actually debate the advisability of making ARES repeater net schedules public information given the implications of the DHS situation, there is also an obvious need to get more hams trained and involved in ARES, active on the nets, present at the meetings, and on site during emergencies. My personal opinion is that there ought to be a consolidated listing of ARES net schedules available at a central point on the web that includes every participating county in Georgia. Heck, maybe even for the entire USA. It could look something like the following, for example.

ARES Org.	Every	Time(ET)	Repeater
DeKalb Co.	Sun	8 pm	145.45-
Forsyth Co.	Tue	8 pm	147.15
Hall Co.	Wed	8 pm	146.67-
etc.	etc.	etc.	etc.

This might serve a number of useful purposes, including the following:

- County ARES groups would all be aware of each other
- Current ARES net schedules could be presented
- Net participation by non-local drop-ins would be easier
- Appropriate visibility and publicity for ARES

Again, the preceding is just my opinion/suggestion. Follow the lead of your EC in all cases.

THE RUMOR MILL

The items below have come to me from curious, interested and/or concerned Georgia repeater owners, trustees, and users.

SERA patches: Had an inquiry the other day about SERA window stickers and patches. Alex N8FWL is doing a feasibility/cost study. I think it's a great idea. If you agree (or disagree), let Alex know. I don't know about you, but I've still got an open advertising spot available on my old hamfest fishin' vest.

Alligator mouth mobiles: Anybody heard that there might soon be new commercially manufactured 75-100W vhf/uhf ham FM mobiles on the horizon? Here's a well-worn tip: never run high power mobile/base radios in the fringe areas of same-adjacent-pair repeaters that aren't suitably protected by tone input. The same applies to high power mobile/base amps. It would be very irresponsible operation, with undesirable consequences for all concerned. It gets worse with a 3+ dB antenna. Bottom line: let's never "ERP" bigger than we need to.

Don't get crossed up: Cross-band mobile repeaters, used responsibly, can be way cool — and more may be coming from the manufacturers. Sadly, history predicts that the legal guidance in the included manuals may range from inadequate to nil.

Reality check: there's stuff we all need to know about cross-band repeating before we plunk down our money for a new rig that we may not legally be able to use the way we had hoped to. Be sure to read the current edition of the ARRL's FCC Rule Book.first. *[The August 2001* ***Repeater Journal*** *carried a* ***Getting Started*** *column on crossband repeat. E-mail the editor for a pdf reprint - KN4AQ]*

The doors have just opened at the Gainesville 2003 Hamfest.

Erasing Paper Repeaters: Georgia (and every other state in the USA) is running low on usable repeater pairs in some bands, largely because a disturbing number (I've heard 30%!) of coordinated repeaters have not been operational for some time. The rub here is that this creates blank spots in Georgia's repeater coverage that nobody (except SERA and the FCC, of course) can easily deal with, since "on paper" these repeaters actually exist.

The complete list of acceptable reasons for an inoperative coordinated repeater is shown below:

- A temporary problem occurs after coordination, for which a solution is actively being pursued.

Get the idea? Okay, everybody understands that stuff happens. Unfortunately, some repeater owners will attempt to hang on to an inop repeater's frequency pair indefinitely. This is where SERA will draw the line after a reasonable waiting period, initiating the de-coordination process and returning the frequency pair to the pool.

The best thing to do if you have (or will have) a paper repeater is to contact your friendly SERA coordinator and make an official request for time to deal with the issue.

Okay, for the record: repeaters that are technically coordinated, but not operational

1) contradict the fundamental amateur radio charter to provide communication services in the event of emergencies,
2) lock up valuable frequency pairs, keeping someone else from stepping up to the plate,
3) violate the SERA coordination agreement, and
4) make SERA look like it's not doing it's job. We take all four of these items very seriously.

So... if you know of any Georgia repeaters that have been inop for 60 days or more let us know. We'll look into it.

Family ham repeaters: It appears to be more than an alarming rumor that valuable (and dwindling) ham repeater pairs are sometimes being coordinated purely for private "FRS" and "GMRS" style operation. For example, two ham members in the same family can technically and legally get their own coordinated frequency pair for a 2M 200W ERP ***closed*** repeater on a mountaintop. And guess what? It's legal! But guess what else? I don't have to like it! It will also probably not engender friendship and cooperation with others in the amateur community who are struggling to find available repeater pairs for *public* amateur use. Can you hear me now?

Errata? Nada! Okay, in my dreams. From time to time a reader will point out something in the RJ's Georgia repeater listing info that doesn't quite jive, and we fix it immediately. Had several recently, in fact. We do appreciate this feedback, so keep it coming.

THE SERA COMPLIANT DEPT

SERA's job is to carefully and professionally coordinate the repeaters of those repeater owners who desire such coordination. Period. There's no rule on the books that says your repeater ***must*** be coordinated. On the other hand, if an uncoordinated repeater interferes with a coordinated repeater then ole' Fox Charley Charley may shut it down. Again, this is fully covered in the current edition of the ARRL's FCC Rule Book.

Don't get me wrong; I'm as independent as anybody. But things sometimes work out better for everyone concerned if a few rules are agreed upon and followed.

So — what can we do together to get every Georgia repeater coordinated (i.e., compliant)? It doesn't seem like a big deal to me. Dit-dit-dit-duh...

FIELD DAY AND REPEATERS

Communication: The Dahlonega area is beautiful country, but its maze of local mountaintops and roads can be pretty intimidating to an outsider. I listened with bemusement and respect on Saturday to the very active N4KHQ 146.835+ repeater Field Day talk-in operations. A significant number of hams who clearly were "not from around there" were able to attend nonetheless due to this well-organized effort.

Intercommunication: I also snooped around several of the Georgia Field Day locations to see what part repeaters might be playing. Again, lots of local repeater talk-in going on, plus on-site simplex. I couldn't help thinking, however, that if Field Day is supposed to show off hams' readiness to cope with communications emergencies, then wouldn't it make sense to also practice using local and linked repeaters for communication b*etween* different Field Day groups? Maybe this is something the cw and phone ops could be doing between HF gigs. Seems like there should be SOMETHING in place for repeater group intercommunication during ARES and other emergencies. Shoot, I don't know. Just a thought.

YOUR OPINIONS PLEASE?

In this column I promise to air whatever's on the mind of Georgia's trustees, control operators, and users—even if I don't agree with it. And, hecky-durn, that's the way it's supposed to work. Just call, write, or send me an email with your question or comment. Certain expletives may be paraphrased or deleted, of course—even if I DO agree with them. ■

Proposed GA Repeaters

Form 03 coordination paperwork was submitted to SERA for the following Georgia repeaters prior to 4/1/03, and SERA is now awaiting the Form 09s. Although most of these are still on schedule, some are — how do I say this — overdue? Maybe I'll color code them appropriately as green, yellow, and red in the next issue of the RJ (hint, hint).

NOTE: once a coordination application (Form 03) is accepted by SERA, an "Okay, I'm now up and running" notification (Form 09) is expected from the repeater owner within six months. A six-month extension is usually granted if requested.

Freq	Callsign	Location
53.010-	W3LAP	Cochran
145.150-	K4TWG	Baconton
145.190-	W4CBA	Gainesville
146.745-	AF4VH	Springfield
147.090+	KE4RWR	Bainbridge
147.225+	KG4ABK	Doerun
147.330+	N4MTN	Toccoa
224.100-	K4SWS	Eatonton
224.220-	KB0Y	Ray City
224.660-	NP2Y	Young Harris
224.720-	W4UWH	Clayton
224.820-	WR4MG	Hawkinsville
441.850+	K4WOC	Sugar Valley
441.975+	WB4ULK	Columbus
442.000+	AF4UL	Macon
442.300+	KW4KW	Ringold
442.425+	K4SWS	Eatonton
442.475+	W1MED	Marlow
442.700+	W4MAZ	Macon
442.775+	K4VJM	Flowery Branch
442.900+	KF4RLZ	Lawrenceville
443.075+	WA4EOC	Canton
443.125+	KG4PUW	Stockbridge
443.125+	W4ZT	Atlanta/Union City
443.525+	N4PQR	Knoxville
443.650+	W4CML	Atlanta
443.675+	WB4QMJ	Calhoun
443.975+	KB4NPO	Rex
444.100+	WR4CW	Atlanta/Glenridge
444.125+	KE4PVE	Pendergrass
444.300+	KC4YNY	Hogansville
444.350+	KE4PVE	Newnan
444.350+	W4CBA	Gainesville
444.775+	N4MXC	Cochran
444.850+	N4YXL	Greensboro
444.850+	KG4OGC	Hinesville
927.4875-	KB0Y	Valdosta

SQUELCHTALE

continued from back page

of hams on the net who don't talk on the repeater any other time.

There are other things besides expired hams and quiet listeners that make repeaters seem quiet now. One of them is the sheer number of repeaters, diluting the operator pool. In 1991, there were four or five repeaters that carried most of the traffic in the Raleigh area, and virtually none on UHF. Now activity is spread among a dozen two meter repeaters and a handful of UHF machines (with a few dozen more that rarely see activity). So maybe things haven't died off as much as it seems.

SERA Survey

I asked the SERA staff and officers what they thought about repeater activity. Responses were mixed:

Getting Started Columnist Jack Mood W4HTX said, "Yes, I notice less activity on the machines I use in the Charlotte NC area." Virginia Assistant Director Charlie Stokes WB4PVT said, "All repeater use in down in South East VA."

Our new Mississippi news columnist Charlie Diamond KG4CKW waxed philosophical, as columnists are wont to do. "Repeater activity has become more cliquish, and some folks are becoming more like HF CB operators . Folks tend to hog a repeater that they choose and shun the newbies. Ham radio seems to have become more snobbish in general and if your not a general there are a lot of hams that won't even talk with you. This attitude has also helped many folks decide not only to not upgrade but to get out of the hobby all together." That's sad, Charlie, but it's not like that where I live. New hams are falling all over each other to take part in activities.

Georgia Assistant Director and columnist Vester Scott N8VKA also gave me a piece of his mind. "If you simply mean "usage", then I'd say there isn't much change. A pretty predictable outcome when the bar must be lowered to practically zero AGL in order to keep the numbers up, methinks."

Ouch! Vester's sounding a bit curmudgeonly, methinks.

Roger Gregory W4RWG, our SC Director, saw things differently, saying, ""I don't see an decline in usage." Nor did Tim Berry WB4GBI, the TN Director, who commented, "Two of my 'quiet' repeaters have picked up. Not sure whether I would call it a trend or not, however."

SERA Secretary and WV Vice Director Alex Hedrick N8FWL made it a bit more personal, with this critique of the operating habits of the SERA Board: "During one SERA meeting, I openly chastised the attending staff members because very few of them were carrying their portable radios..... but, they all had their damn cell phones on their belt." Didn't help, did it, Alex? There are still very few HT's at the table. No room with all those notebook computers.

Well, repeater owners are fairly notorious for not actually using their machines, and for hiding out on UHF while the rabble uses the two meter repeater. When I started working with Wayne to take over the Repeater Journal, I noticed something a little sad. He had a nice pile of ham equipment in one corner of his living room, but most of it wasn't connected. There was a couch pushed up in front of it. His antenna array had been damaged in a storm, and was mostly non-functional. He had one working HT, if he remembered to charge the batteries.

Wayne had been active. He told me how, when the beams were working, he could work a mobile simplex 75 miles away just like a local. He fired the HT up on the Mt. Mitchell repeater on one trip to the SERA Board meeting, and a bunch of people called him, wondering where he'd been. But for the last few years, ham radio, for Wayne, was hamfests, SERA and the *Repeater Journal.*

In the August *CQ* magazine, editor Rich Moseson W2VU writes about "personal sunspot cycles" - operating interest cycles, really, where hams come and go from the radio, sometimes for years. I had one that lasted about 10 years. I've been back for 13 years, since moving to Raleigh. I stay pretty active, but I'll admit that when I'm in the shack, the computer beckons more than the radio does. When I do get on the air, you'll often hear me say "I've got to get back to work..."

There are some statistics that point to a softening, if not bursting, of that mid 90's Tech bubble. Hamfest attendance is one. My local club is another, down to an average of 300 members from the record high of just over 500. But there are other factors at work there. Hams say e-Bay has bitten hamfests. The soft economy isn't helping. And 300 members is still bigger than it was when I joined in 1990. I expected a bigger hit than we've seen when we reached the 10-year point on the new Tech licenses. The 18,000 we lost is less than I expected. Ham radio is not growing fast today, but it is not shrinking, at least in terms of licensed hams. We need to work at it, but it's not all gloom.

My advice: pick up the microphone, think of something interesting to talk about, and get on the air.

Field Day Tour?

KN4AQ was a no-show on the grand North Carolina Field Day Tour. Thanks and sorry to the many clubs that invited me to stop by. I got a call from a client who needed me that weekend. I'd already turned them down a few weeks earlier for a ham radio function. I couldn't do it twice and stay in business. NC Section Manager John Covington W4CC did make "the tour," modeled, he says, on Gene Fegley's legendary travels through the state. Maybe I can enlist him for a write-up next year. It is very educational, and a lot of fun, to see what a bunch of different ham groups do for FD.

60 Meters, WRC 2003

There have been some big things happening in ham radio outside the world of repeaters. We've gained five discrete frequencies to use near 5 MHz (60 meters). At the recent World Radiocommunication Conference, the cw requirement for HF ham licensing was dropped, and at the end of this decade, shortwave broadcasters will leave a big portion of the 40 meter band.

I was ready for 60 on Day One (July 3rd). I missed the stroke of midnight, but tuned in about 3 AM to see what was happening. Lightning static was 10 over S9, and most signals were having a hard time competing. But the five channels were busy. Everyone seemed to be right on frequency. I've been more interested in propagation and band use during the day, though, when we hope it will fill in a gap in coverage for emergency communications when 80 is about dead and 40 is too long. I often leave my HF rig squelched on "channel 1" - 5330.5 kHz. Most of the time it's quiet. I hear stations between 50 and 400 miles away, but signals are usually not very strong. I have not run any tests to compare signals on 80, 60 and 40 meters, but I'd like to over the course of a few weeks.

I'm glad we'll be getting an exclusive nighttime hunk of 40, and the rest of the world will get a phone band to share with us (Region 1 and 3 will expand up to 7200 kHz. We'll still be sharing 7200 - 7300 with the broadcasters at night). It's not happening until 2009, so I'll think more about it then.

Cw changes should come sooner. The US, and the rest of the world, is no longer treaty-bound to require some knowledge of cw for an HF ham license. The ARRL opines that the FCC can't and won't change the rules to drop the cw license test in the US by fiat. They'll have to go through a rulemaking procedure with comments and all, first. I predict that will happen. There will be a loud cry from the contingent that thinks cw should remain a requirement, but they will not prevail. Cw itself will remain with us for a long time. Some new hams will take it up just because they want to. It may never die completely, but use will shrink slowly.

The open questions are how much phone band (or other mode) expansion will erode the protected cw band segments, and will dropping cw spark another boomlet in ham licensing, or just upgrading?

Maybe I'll see you on HF!

SQUELCHTALE

Gary Pearce
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Now You're Missing?

The conventional wisdom is that repeaters are a lot quieter than they were. Were when? It's an ambiguous time in the past. I'm going to peg it as the mid 90's, though I could go back to the late 70's as a reference marker.

I suppose it's true. I don't know of any source for hard data, so all we have are personal observations, and for most of us, that's local or at best regional. But the reports are consistent enough from area to area that there must be something to it. So what's up? Or perhaps what's down?

Bubble memory

In early 1991 the FCC created the revolutionary no-code Tech license. Over the next few years, the ham population soared. It was glory (or gory) days for instructors and VE teams, with dozens of students in classes and hundreds lined up to take tests. Clearly there was pent-up demand from people who wanted to become hams - or thought they did, but were held back by code. The number of US hams more than doubled, from around 250,000 to more than 600,000.

They got on the air, mostly on VHF FM Repeaters. Lots of them joined clubs. My local club (the Raleigh Amateur Radio Society) also doubled in size, topping 500 members. SERA's associate membership grew. Lots more repeaters got built. Hamfests boomed. Radio sales surged. I'll stop now because I'm running out of verbs.

And then, it appears, a substantial number of them decided maybe they didn't want to be hams so bad, after all. Why? I'm sure it's lots of reasons. One line of reasoning I've heard is that many of the new hams just wanted a communications tool, not a hobby, and were disenchanted once they got in. Seems like a lot of work, getting a ham license just to have a two-way radio you can't use for business, though it's been happening in boating circles for a long time. Then there are the usual suspects: the Internet came along and provided an interesting alternative in communications. There were lots of other activities, and 500 channels of cable TV competing for attention. Cheap cell phones took the blush off of autopatch and repeaters for family communications.

Activity dropped, club membership fell, hamfest attendance declined, and I'm out of verbs again. So the advent of no-code created something of a "bubble" in our population. The bubble didn't exactly burst... it's just been leaking air as many new hams lost interest and turned off their radios.

The numbers

They may not be lost for all time. The FCC's ULS allows a search for expired licenses over the past two years, prime time for the new Tech's 10-year license terms to expire if they'd lost interest that completely. If I'm interpreting it right, just over 41,000 licenses did expire in the past two years. That's less than a quarter of the new hams licensed in the first years after code-free was initiated. Some of those may yet renew, since they're in their two-year grace period, if they're not daunted by the on-line renewal system.

A breakdown of that number is even more interesting. Of the 41,000 expired licenses, there are:

8,000 Novices
18, 500 Techs
3,800 Generals
2,466 Advanced
1,600 Extras

So a lot of those new Techs did fail to renew, about 10%. That's not as bad as I thought it would be.

On the air, it's not just the new Techs who are missing. I've been around Raleigh for over 13 years, listening to area repeaters intently. Most have a group of "regulars" who show up at drive time, or whatever time of day they have for hamming. New voices come, old ones go, and every few years the groups of regulars turn over almost completely. Very few of the hams I talked to around here when I first got here are still on the air. I have to keep working hard to maintain my status as "legend" (in my own mind) among a constantly shifting population of local hams.

Lurkers and listeners

Drive-time listening can be deceiving. Five or six hams chatting for an hour commute can make a repeater seem busy, but they're a small number of those who are really out there, just listening. My commute to work is a little later than most around here, about 20 minutes sometime between 8 and 9 AM. There was never anyone on my club repeater. So I decided to see if there was anyone out there in the woodwork. I began calling the "After 8 late-to-work" net, and ad-libbed a net preamble that listed all the types of hams who might be out driving around that time of day: hams who are late to work, not late to work, students on break, salesmen who drive around all day and don't get any work done, night-shift just getting off work, hams on vacation, retired....

Out of the woodwork they came! Five, ten, fifteen, twenty or more. A retired ham (Bill Lyon N4CAR) saw that this was a handful for me to handle while mobile, and offered to be "net control." He ran the net for an hour each morning, and the casual ragchews kept going strong long after I arrived at work. And he kept it up for several years before getting tired of the routine. Nobody else wanted to keep running it, so the net ended and the repeater went back to being quiet after the 7 AM crowd got to work.

Now and then I'll revive it while I'm driving, and half a dozen hams will be there, still just listening. Some of the older ones will remember the net and express nostalgia for the fun. Our 8 PM daily net is booming, drawing 15 to 25 check-ins. You hear calls

CONTINUED ON PAGE 60