RECOMMENDED POWER AND ANTENNA HEIGHT GUIDELINES FOR LAN's AND WAN's

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What follows is simply an appeal that we apply some degree of frequency coordination within the digital allocations on two meter FM. We have noted rapid growth in the WASH DC area as shown in figure 1 with over 38 BBS's, 35 DIGI's and a number of NET/ROMS and TCP/IP nodes spread over the 100 KHz segments starting at 145.0, 145.5 and 145.6 plus 221 MHZ. The nature of packet radio is quite forgiving in accommodating multiple users and a mix of services on any one frequency. But condoning a total free-for-all mixture can not possibly result in an effecient network. The opposite extreme of total coordination and rule making is restrictive and abhored by most radio amateurs.

Figures 2 and 3 show the two extremes of purely LOCAL LANs and WIDE area LANs. What I hope to show is that local LANs should be kept relatively limited in range and that wide area LANS may cover as much area as they need. BUT THAT THE TWO FUNCTIONS SHOULD BE ON SEPARATE FREQUENCIES to optimize the effeciency of both.

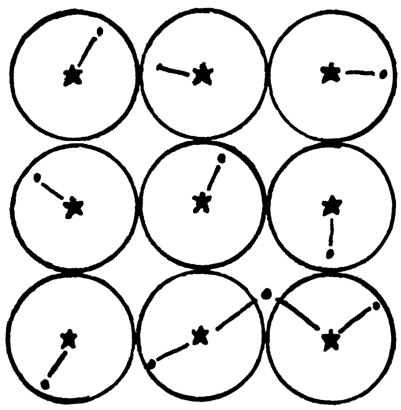

Figure 2. Nine local area LANs on the same frequency with 9 users use-ing 9 different local BBSs with no contention. There is no hidden transmitter problem and each user gets 100% of the channel during his session.

MAKING LAN'S AND WAN'S WORK

To make cellular work, however, there has to be cell-to-cell or LAN-to- LAN connectivity. This is where the wide area LAN of figure 2 plays its best role. The wide area full dux repeater is an optimum solution to moving LAN-to-LAN traffic in this example. The wide area repeater is also optimum where a given community of users whos traffic statistics look like a LAN are widely geographically distributed. There is an equal need for this capability in the area.

Figures 2 and 3 show the same users and same service areas but to have the same performance, the Full-Dux repeater and all users and services of figure 3 will have to operate at 8 times the data rate as those same users in figure 2. Since the Ful-Dux repeater takes two freqs, the overall effeciency in this worst case example is 16 to 1 in favor of the figure 2 approach. Ma Bell was no dummy when she invented cellular!

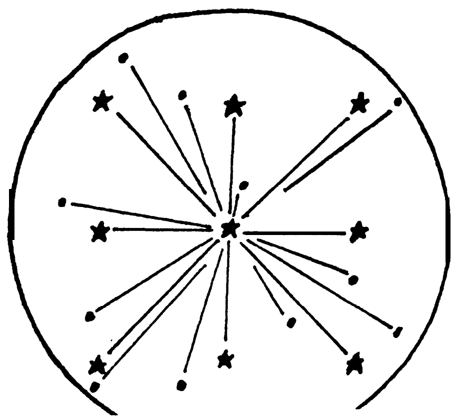

Figure 2. One wide area WAN with eight users using 8 different BBSs through a wide area digipeater or node. A full dux repeater is required to solve the hidden transmitter problem.

There should be no argument that delivering mail via the present BBS systems is a purely local function. Our goal should be that every HAM everywhere has access to at least one mail drop system. We have reached that condition in the DC area and we should optimize that function, but not at the expense of others, through reasonable frequency management. With most BBS software supporting multiple ports and frequencies, the separation of user access from forwarding channels is going well and must continue to be encouraged. This establishes the basic cellular LAN structure.

RECOMMENDED LAN GUIDELINES

The second part of the cellular equation is minimizing interference through geographic distribution and power limitations. Since most BBS stations are located at home stations with typical antenna heights, they serve as a good cell center model. They should be balanced with their users so there is no need to have a lkw power level if the user is typically only running 25 watts or less. The following recommended power levels for BBS's digipeaters, NET/ROMS, TCP-IP and any other 24 hour service on the LAN frequencies provide a service area of over 450 square miles (12 mile radius). This coverage limitation should not be too restrictive to the typical ham station which is being used as a LAN service provider, but it does discourage the installation of aligators on LAN frequencies which are disruptive over large areas. A 100 watt digipeater with 6 db gain antenna at 1600 feet QRM's an area of over 20,000 square miles!

ANTENNA HEIGHT ABOVE AVERAGE TERRAIN	RECOMMENDED POWER LEVEL
1000	0.1 w
300	1 W
100	10 w
75	25 W
50	40 w
25	150 w

Similar to conventional voice repeater frequency coordination, this proposal places no restrictions on who can operate on LAN frequencies, only on the area of their influence. In fact, all forms of digital services are equally welcome including BBS's, digis, NETROMS, repeaters, and TCP-IP; although some of these would be less useful than others under the LAN restrictions. Home users could even be encouraged to leave their stations in the unattended digi mode to assist connectivity within the LAN. Anyone may also operate his station at any power level and at any height but not as an unattended service provider on the LAN frequency. Direct BBS forwarding would be permitted where needed on LAN frequencies, but longhaul, digipeated and bulletin forwarding should be limited to non-prime hours or moved over to the WAN frequencies.

This proposal has no intent to establish particular cells or to provide exclusive protection for any particular LAN, but to simply provide a protective framework for the LAN concept. A few frequencies are required so that multiple services in a close geographic area can choose separate frequencies. It would seem that 4 or 5 frequencies should fill this need.

RECOMMENDED PACKET 2 METER BAND PLAN

144.91 reserved for voice (no packet)
144.93 reserved for voice (no packet)
144.95 reserved for voice (no packet)
144.97 reserved for voice (no packet)
144.99 reserved for voice (no packet)

145.01 WAN longhaul primary
145.03 WAN regional
145.05 WAN regional
145.07 WAN regional
145.09 WAN longhaul

145.51 LAN guidelines
145.53 LAN guidelines
145.55 LAN guidelines
145.57 LAN guidelines
145.59 LAN guidelines

145.61 WAN longhaul
145.63 WAN longhaul (possible FDUX out)
145.65 WAN regional
145.67 WAN regional (possible FDUX out)
145.69 WAN longhaul

WAN GUIDELINES

Finally, this proposal cannot work without wide area systems. Without WAN's, packet radio would appear too restrictive to the average HAM who wants to exploit his full potential. All WAN initiatives should be strongly supported and encouraged. There should be no restrictions on the power and range coverage of WAN's although careful planning and coordination can be particularly productive in improving the performance of separate WANs used for longhaul, backbone, mail forwarding, and wide area access. Separating WANs and LANs will help the HAM packeteer have the best of both worlds.

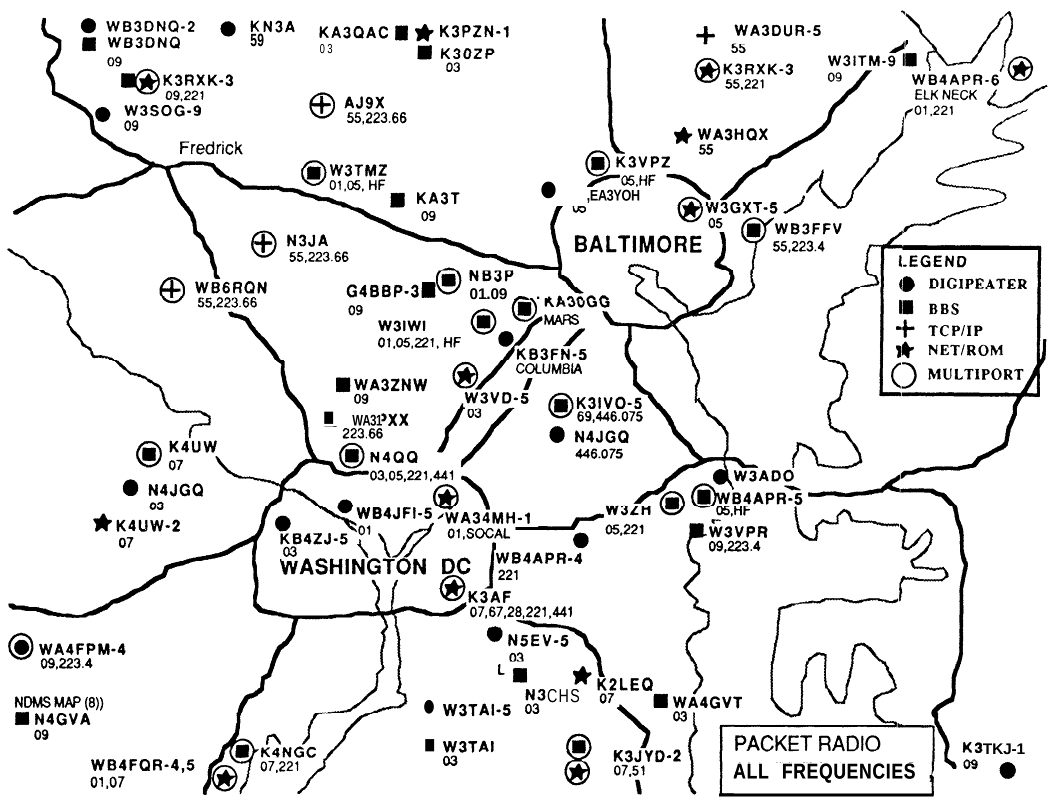

Figure 1. Permanent packet services in the Washington DC and Baltimore areas. Eight two meter frequencies three 220, and three UHF frequencies are in use. So far there are no agreed upon frequencies for LANs only.