

An Introduction to FlexNet

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Abstract

Features and operation of FlexNet packet networking software are discussed. Details of the software architecture, RMNC and MS-DOS hardware platforms, applications, user interface, adaptive parameters, and routing techniques are presented.

Introduction

FlexNet is a flexible, modular and user-friendly software program for packet radio networking. First conceived in 1987, the software has undergone numerous changes and improvements since then, and is presently (July 1995) at version 3.3. The most notable features of FlexNet are:

Autorouter

Automatically routes all connect requests with minimal input required

of the user.

Adaptive Parameters

All network parameters (except TXDelay) are automatically set by the software and adapt to changing channel conditions.

Hop-to-hop Acknowledge

Each packet is ack'd directly by its neighbor, improving data transport reliability.

Command Interpreter

The software interacts directly with the user and has numerous internal applications providing detailed data concerning the configuration and status of the node.

Remote Controllability

The node is completely remote-controllable, also allowing for remote tracing of a QSO with several filters.

Modular and Portable Architecture

Over 95 percent is written in C, allowing wide portability across platforms.

DAMA

Master and slave implemented. All channels may be master or slave, or mixed as desired.

FlexNet is presently the most widely used packet radio networking software in Germany, with over 500 installations. Due to German amateur radio regulations, each unattended station (node) must receive special permission to operate and must use tightly coordinated dedicated point-to-point links. Despite creating problems and red

In This Issue

Intro to FlexNet.	1
Are you still a member?	3
DX spotting nodes	6
President's Message	8
AA4RE BBS vs Y2K	9
APRS move to 144.93	9
Packet BBS's	10
ARRL comments on CSVHF Petition	10
General meeting, 1998	11
ReMailer Excerpts	12
NCPA comments on FCC Biennial part 97 review	15
Digital Band Plan	16

tape, these limitations have forced the creation of a very high-quality network where round-trip response times over hundreds of kilometers and tens of node sites are typically only a few seconds. Although FlexNet is primarily used for networking, the PC version can also be used by users by simply eliminating the Node module. PC/FlexNet is thus a flexible yet powerful replacement for permanent TNC emulations (such as TFPCX). It is extremely simple to set up since there are no hassles with parameters. FlexNet software is a copyrighted product of Gunter Jost

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Hardware

FlexNet is presently ported to two hardware platforms: The Rhein-Main Net Controller (RMNC) system and the Intel 80x86 processor running MS-DOS. The RMNC platform is a 6809-based system using a Z8530 SCC. Each channel control card (one for each radio/data channel) is on a standard Eurocard and is plugged into a standard card cage with backplane bus. One master card can control up to 15 slave cards. Developed by the Frankfurt (Rhein-Main) Packet Radio Group, the RMNC remains the preferred platform for FlexNet because of its low cost and high performance. The software resides on a single EPROM.

The MS-DOS version has existed since 1990, but was not distributed, as it was used primarily as a test and development platform. In 1994, development of a stable version for MS-DOS was begun in earnest. FlexNet runs problem-free in an XT-class system, although faster processors are preferred. A number of different channel drivers exist, allowing for some flexibility in I/O hardware. The choice of MS-DOS was based primarily upon the large installed base. Admittedly, a better choice would be Linux, and in fact the task of porting FlexNet over is already being worked upon.

Architecture

In 1994, a discussion between the present FlexNet author (DK7WJ) and BayCom author Flori Radlherr DL8MBT yielded a new concept for FlexNet: Modularity. The major portions of the software were developed as separate modules, the most important being the channel drivers and applications. These modules can be used

in combinations as desired, on either hardware platform, creating a very flexible system and allowing a larger number of authors to contribute talent. In the near future, a "developer's kit" will be available, further easing module development.

A number of driver modules presently exist:

USCC

Driver for all BayCom SCC cards. The card type is automatically detected.

SER12

Driver for the serial BayCom AFSK modem.

KISS

Driver for connection to a computer. This driver should not be used with a TNC, as the channel timing is not as precise as it should be, especially in the half-duplex mode. FIFO UARTs are supported, allowing data rates up to 115,200 baud on a 286/16.

6PACK

Driver for TNCs. 6PACK is a new protocol which overcomes timing problems with KISS and TNCs. This protocol is able to control up to 8 TNCs in a ring (without tokens!), however the data rate on the RS-232 side should be greater than the sum of the RF baud rates. Beta-testing is currently underway, involves replacing the TNC's EPROM.

PAR96

Driver for the parallel version of the BayCom 9600 baud G3RUH-compatible modem

IPXN

Driver for Novell-IPX networks. Those that already have such a network running can link PCs using FlexNet. Traffic runs in the local net segment as broadcasts and each FlexNet station monitors the net traffic.

IPXPD

The same as IPXN, except that the packet driver is replaced with the IPX protocol itself. To be compatible with an IPXN system on Ethernet, only used

when a Novell installation is not available.

IPPD

AX/IP, a provision of IP to allow point-to-point connections over Ethernet. ARP is rudimentarily implemented. Not a solution for an internet link, but functional. Eventually to be integrated into a TCP/IP module.

VANESSA

Driver for the VANESSA channel card. This card from the Swiss SEPRAN group can control 2 RF channels and has its own processor, significantly reducing the PCs workload.

Other drivers being developed include those for TMC320C25 DSP systems as well as Sound Blaster cards.

Applications

The FlexNet system supports a number of applications, primarily for the purpose of providing users and Sysops with information about the network or a node. These applications are mentioned in "User Interface" below. Due to the modular design of FlexNet, implementing new applications is relatively easy, and can be written by anyone having sufficient programming experience. Three unique applications deserve special mention:

TFEMU

Hostmode emulation. PC/FlexNet can be used with this application as a driver for various hostmode programs, such as BBS, DXCluster, terminal programs, etc.

ETHEREMU

FlexNet can be used with this application to emulate an ethernet packet driver, allowing for example NCSA-Telnet or Winsocket applications to be worked via AX.25 Datagrams or Virtual Circuits.

RDOS

Remote DOS interface for service. This application allows full remote control of MS-DOS, even such local utilities such as formatting a disk.

Are You Still a NCPA Member?

Please check the mailing label...Has your membership expired? If so, why not renew your membership now while you're thinking about it? (There's a form on the back cover.)

If your membership expired before 1997, then this will be your last Downlink!

Memberships have been extended to allow for the fact that the *Downlink* hasn't come out quarterly, but this is it for those with 1996 expirations. If you are in that category, but feel you should have more issues coming anyway, please contact the secretary or president.

User Interface

FlexNet appears as a simple interactive application to the user. A number of commands are used to set up connections, access applications, etc. The user connects to the node's user port and sends the desired command. To initiate a connection, the user need merely specify the destination, although other options including manual routing are possible. The commands available to the user are summarized below. A complete description of all commands is given in the Sysop documentation, presently available in German, but

Northern California Packet Association

expected to be translated to English before Autumn 1995.

<A>ktuell (Current_info)

Displays a current-interest text uploaded by the sysop.

eacon

Displays the Beacon text. From this file one can see which beacon is sent at what interval from which ports.

<C>onverse

Starts FlexNet Converse mode (if sent without a call sign following, otherwise see CONNECT below). 255 channels are available. Function and usage of the FlexNet Converse mode is similar to other popular conference systems.

<C>onnect

Starts a connect request to another station when followed by a call sign. A connect command can also be established by the user without being connected to the node by specifying the entry and exit points of the network, and the destination. The node routes (see "Routing" below) SABM frames towards the destination and sends the message "link setup..." to the user. If the connection is ack'd by the destination station, the user receives the message "*** connected to <call>". If unsuccessful, the message "*** failure with <call>" is sent to the user. If a DM is received from the destination, the message "*** busy from <call>" is sent to the user. The connect request can be broken by sending a <CR> or a new connect request. If a user attempts to connect to a station he is already connected to, he receives the message "*** can't connect twice". This command can also be used to connect to a different user port at a node site that has more than one user port. For example, the command "C-7" connects the user to the port with SSID 7, which is acknowledged with the message "*** <call>: ssid ok"

After using the Connect mode, if the other station disconnects, the user is reconnected to the last node connected to, which is announced with the message

"*** reconnected to <call>".

It is not permitted to manually route a connect request to form a loop, where the connection passes through the same node twice. If an attempt is made, the user is informed with "*** <call> loop detected", and reconnected to the previous node.

<D>estinations

Shows the automatically-generated destination table. Information includes the call sign, SSID range, measured ping time (100 mS steps) and, optionally, the entire route to the destination. It should be noted that the destination list is nearly identical in every node in the network, since all updates are propagated throughout the entire network immediately. The user can also selectively view the destination table, for example "D HB9" shows all destinations having call signs beginning with HB9.

<F>ind

This command, one of the most powerful in FlexNet, sends a request to all nodes in the network (can be limited by the sysop, see also Setsearch) to find a particular station. Each node sends an UNproto frame addressed to the station to be found. If the station hears this frame, it will send a DM frame. If this occurs, a message is sent back to the user exactly where the desired station can be found. If there is no response, the user receives no message. Since UNproto frames can get lost, the user should send the command a few times to be sure. Naturally, the AX.25 protocol requires that the correct SSID be used.

<H>elp

Sends a help file uploaded by the sysop.

<I>nfo

Sends an information file uploaded by the sysop

<L>inks

Lists the sysop-defined link table, showing all ports, neighboring nodes, and their status.

<LO>cal

Sends the node's connect text file. Always sent when connecting directly to

the user port, this command allows the text to be viewed remotely.

<M>heard

Displays up to 200 heard call signs with time stamp and channel number.

<MY>call

Displays the node's call sign and SSID range.

<P>arameters

Displays a detailed list of all ports at the node, their parameters, various link statistics, and their status.

<Q>uit

Disconnects the user from the node, after the node sends "73!".

<S>etsearch

Shows which nodes will transmit the Find message.

<U>sers

Lists all users of the node, including those just passing through. Shows QSO number (internally generated), connection status, data frames unack'd, port, and call signs involved.

<IO> (Input/Ouptut)

Shows status of each of the 16 binary inputs and outputs (RMNC version).

Sysop Commands: The following additional or expanded commands are available exclusively to the sysop:

<L>inks

Set links list

<M>ycall

Set call sign and SSID range

<P>arms

Set various parameters

<IO>

Read all input lines and/or set all output lines

<CA>

Send a CALibrate signal

<K>ill

Kill a specific QSO

<MO>de

Set HDLC parameters

<SY>sop

sysop authentication

<W>rite

upload various text files

<T>race

monitor all activity on a channel remotely

<RESET> Cold reset

<RESTART> Warm reset

Connection Phases

There are four possible phases for any given connection or QSO: Link Setup; Information Transfer; Link Failure; and Disconnect. Each phase is discussed

briefly:

1. Link Setup

During a connection setup, the connect (SABM) frames are simply routed through the network (see "Routing Methods", below), without being directly acknowledged (No UA Frame). Thus, a connection can only be made when the destination station is actually available, for it is the only station that will acknowledge the SABM frame.

When the called station acknowledges the connection with a UA frame, it is passed back (again without any hop-by-hop ack) to the calling station. At this point, there are two QSOs in the QSO list on every node involved: one from calling station to destination station and one in the reverse direction. Once the calling station receives the destination station's UA frame, the link is established (as a Virtual Circuit) and information transfer can begin.

The reason for this method, instead of the more conventional direct acknowledge for SABM frames, is that very few network resources are wasted on connect requests that cannot be established, yet good connections are established fairly quickly. In the FlexNet network installed in Europe, typical response times from end to end are on the order of a few seconds, so timeouts, lost packets, and other problems are rare.

2. Information transfer

During the information transfer phase of a QSO a 'Hop-by-hop Acknowledge' is used. Each I-Frame (packet frame containing some information) from one or the other station is directly acknowledged by the node and then passed along to the next node along the path (also directly ack'd). Retries caused by whatever reason on a given link are thus only retries across one link and not across the entire path.

The entire path is completely transparent to PIDs. Once the Virtual Circuit is set up, any manner of data

(such as TCP/IP or other protocols) will pass transparently through the network without any alterations.

3. Link failure

If, during information transfer, the path is broken for some reason, the end nodes report the link failure to both stations with the message '*** DB0xxx --> Link Failure' and the session is disconnected.

4. Disconnect

If station A sends a disconnect frame, it is immediately ack'd by the local node. The node then attempts to sever the connection to station B. If there is no data remaining 'in the pipeline' for station B, the disconnect occurs immediately. If data remains, it is first passed to station B and then the link is disconnected. If station B had sent data to station A, it is lost.

Routing Methods

To connect, it is only necessary for the user to specify the point of entry to the network and the destination. There are four methods available to route the users connect request:

1. Routing by destination table
2. Routing by link table
3. Routing by Heard list
4. Routing by SSID

Routing is only performed for the Connect (SABM) frame. Once the Virtual Circuit is set up (the UA of the SABM is received by the calling station), all subsequent frames take the exact same path. If a failure occurs, the link is torn down after informing both ends of the failure. A failed link must be reestablished manually.

1. Routing by destination table

The first method is based upon routing by call sign information. Thereby seeks the node, the next available node call sign of the received frames, and compares this with a table of calls that have been stored in a destination table by the autorouter. If a match is found, the call is passed along

to the specified neighbor. [NOTE: All node call signs begin with DB0...]

Example: DB0ODW has the following links:

- 1: DB0KT
- 2: DB0AAC
- 3: DB0IE

and knows the following destinations: DB0EQ, DB0ZDF, etc.

The frame

<fm DG3FBL to DK7WJ via DB0ODW,DB0ZDF>

is expanded to:

<fm DG3FBL to DK7WJ via DB0ODW,DB0AAC,DB0ZDF>

This is because DB0ODW knows that DB0AAC (which it has a direct link to, on Port 2) is the next (and best choice) node along the path to DB0ZDF. Thus, the frame is sent via Port 2, despite the fact that there is no direct link to DB0ZDF. The 'best' path is always selected for any given destination, as determined by the average 'ping' time for a given path.

The node sends out test frames ("Pings") to each neighbor and then stores the round-trip response time. Using the ping information, the destination tables are constantly updated in real time. If a destination becomes available (or unavailable), that information is instantly broadcast throughout the network (limited only by the propagation time through the network), thus all destination tables are nearly identical. The destination table is built automatically and cannot be changed by the operators. It is thus assured that only accessible destinations are forwarded and instantly deleted when they (or their path) disappear.

2. Routing by link table

If the autorouter does not find an entry in the destination table, it then goes to the sysop-defined link table. If a pre-defined route is found here, the frame is sent to the specified neighbor (on a specified port) for handling. The link table normally contains only the direct neighbors, that is, those nodes having a direct link with the node.

Northern California Packet Association

Example: DB0ODW has the following links:

- 1: DB0KT
- 2: DB0AAC
- 3: DB0IE
- 4: DB0AIS

The frame

<fm DG3FBL to DK7WJ via DB0ODW,DB0AIS>

would be routed to Port 4 so long as no entry exists in the destination table, because DB0AIS is known in the link table. Hopefully, DB0AIS would have a route to DB0ODW.

3. Routing by Heard list

The node stores the last 200 directly heard call signs in an internal list. This

list remains in memory until a RESET occurs. An entry to this list occurs only when a station has an active connection, or when it is found using the 'Seek' command. At first, the node uses the SSID of the desired station to establish a connection but, if there is no response, then the SSID is ignored. It is therefore without problems possible to be in STBY on various ports with various SSIDs, so that one can always be found on the correct port. Incoming connect requests or also UNproto frames are routed with this list.

4. Routing by SSID

A final chance for the node to route frames is based upon the SSID. Specific

channels can be arranged by SSID (this can also be done by Port number). This is shown with the PARMS command. To use the SSID routing, the user specifies the SSID (Port) that the frame should be sent from.

Example: DB0ODW has the following arrangement of SSID versus Channel numbers: Channel 1 has SSID 0, Channel 5 has SSID 12, Channel 6 has SSID 3, etc. If a connect frame arrives that has specified a SSID for DB0ODW, the frame is routed directly to the channel specified by the SSID:

The frame <fm DG3FBL to DK7WJ via DB0ODW-12> is routed to channel 5, which has the SSID of 12, so long as no other way to DK7WJ is known.

DX Spotting Nodes

June 1999

<u>Location</u>	<u>Call</u>	<u>Alias</u>	<u>Frequency</u>	<u>Coverage</u>	
California City	K6ZZ		144.490	Antelope Valley area	
	EARN8		144.490	Oak Peak	
Castro Valley	W6RGG	DXCV	145.770	East, West, South SF Bay area	
	Chico	K6EL	DXC	145.670	Chico
		K6EL	DXW	145.670	Oroville, Red Bluff
Hanford		K6EL	DX	144.950	South Fork Mtn - Redding area
		K6UR	DXFRES	144.950	Bear Mtn, Fresno area
		K6UR	DX7	145.770	Mt. Adelaide, Bakersfield area
		K6UR	DX16	145.770	Oakhurst
Livermore	NF6S	DXL	145.770	Tri-Valley area	
Los Gatos	N6ST	DXLG	146.580	Santa Cruz Mtns, Monterey Bay	
		N6ST	DXF	146.580	Santa Cruz/Los Gatos
Mountain View	K6LLK	DXMV	144.950	Mountain View, San Jose area	
Oakdale	K6OQ		146.580	Modesto area	
Penngrove	K6ANP	DXANP	144.950	Sonoma County	
Reno, Nevada	N7TR	RENODX	144.950, 146.58, 441.500 (2400 baud), 51.7		
		N7TR	PCDX1	146.580	Low Level in Reno
		N7TR	PCDX	144.950	Virginia City, NV
		N7TR	DX2400	441.500 (2400 baud)	
Rio Linda	W6GO	DXRL	144.950	Sacramento, Woodland, Davis	
San Francisco	W6OTC	DXSF	145.670	East Bay and North	

Bob Vallio - W6RGG wsixrgg@crl.com

The following frame is sent out from channel 5: <fm DG3FBL to DK7WJ vDB00DW-3*>, which clearly shows where the frame came from (in this case, channel 6 has the SSID 3). This also carries the entry node information. This turnaround of SSIDs is also notable in that every frame shows where it came from.

One of the most important features of FlexNet is that all connections are reversible, that is, you are always provided sufficient info to have the same connection in the reverse direction. This routing method is naturally used above all for user access. If all of these routing methods fail, the connect frame is lost. If this occurs when the user is connected to the node, the message "**** <call sign>: can't route" is sent to the user. If the user issued a connect command when disconnected from the node, the TNC will eventually reach the RETry limit.

Adaptive Parameters

All level 1 and level 2 parameters within the network (including user access channels) are either self-adjusting according to the current channel conditions or fixed in the software. The only exception to this is TXDelay, which is set by the sysop. A RETry limit of 10 is used to ensure a quick recovery for links subjected to temporary interference. Regular polling is used to verify that links are operational as well as to determine the actual one-way or round trip data transfer time.

The polling interval, controlled by FRACK (T1), varies according to channel conditions. If FRACK is small, polling occurs no sooner than every 90 seconds, lengthening when FRACK becomes larger. Each node polls only its neighbors. The round-trip turnaround time is used to adjust FRACK (T1) to the time it takes for the neighboring station to acknowledge I-frames, and is also used (along with other factors) by the autorouter to determine the best (fastest) path to other stations.

MAXframe is regulated according

to the capability of the link. When the other station receives all frames without problems, MAXframe runs as high as 7. At 1200 baud, 7 frames in a row are seldom sent, since the maximum key-down time is limited to about 12 seconds. When multiple streams are active, the 12 seconds is divided up and shared. When the other station begins missing frames (for example by sending reject frames), MAXframe is reduced. In this case, the throughput is actually increased with a lower MAXframe. It should be noted that evaluation checks the link quality TO the other station, not FROM the other station, and that the value changes as necessary. A poll, in which all frames are acknowledged, or with lost acknowledgments, don't reduce MAXframe.

P-Persistence is the critical parameter when many users are on the channel simultaneously. A fixed parameter is, at best, a compromise between collision potential and transmit potential. FlexNet notes the number of users on the channel, as well as the data rate and other factors, and adjusts P-Persistence to offer the best performance at all times. Aggressive stations no longer have the advantage of faster performance at the expense of weaker stations, yet fast downloads remain feasible when channel activity is low. The improvement over a fixed parameter is most notable on duplex user ports (the most common in Germany), but improvement is noticeable on simplex channels as well.

Concerning TXDelay, if the node hears more than 100 ms of flags from a user station, which indicates an excessive TXDelay setting in the users TNC, a polite message is sent informing the user of this fact, and then disconnects. Thus, a user running excessive TXDelay cannot use the network until the problem is corrected.

It would be highly desirable if user software were to also follow the trend towards full adaptation to the channel conditions. It is clear that a computer can

adjust to prevailing conditions faster and more accurately than a human, not to mention the fact that most users are totally baffled by TNC parameters anyway. Other problems also are caused by using a single fixed parameter to control a constantly changing channel, which would be resolved with adaptive user software. PC/FlexNet can be installed as user software to take full advantage of adaptive parameter adjustment by simply omitting the Node module. It becomes a powerful yet flexible replacement for permanent TNC emulations like TFPCX - simply use FlexNet with TFEMU and channel drivers as needed. Setup is simple, with only one parameter (TXDelay) requiring operator input.

Working with TheNET

It is relatively easy and painless to include TheNET network nodes into a FlexNet network. Each TheNET node that interfaces directly with a FlexNet node appears in the FlexNet destination table. The interface must be single-stepped manually, but no serious problems occur as TheNET users are used to single-stepping ;-)

For Further Information

This overview is necessarily brief. Complete details are available with the software) or in a separate printed documentation from the author.

References:

G. Jost, DK7WJ and J. Sonnabend, DG3FBL, "FlexNet, the European Solution", Proceedings of the 9th ARRL Computer Networking Conference, pp127-133, 1990.

G. Jost, DK7WJ, "FlexNet Sysop Manual v3.3", 2nd edition, 1995.

EOF

President's Message

Gary Mitchell, WB6YRU

Downlink

First, I must once again apologize about the *Downlink* publishing schedule. It seems our latest editor followed suit with our previous two editors and decided to leave us high & dry. And, once again, I find myself having to fill in as editor pro tem.

This was supposed to be the winter '99 issue. Perhaps I should have not waited as long as I did before jumping in, but I was hoping against hope our editor would come through after all.

As before, memberships will be automatically extended to allow for the fact that the issues haven't come out on a quarterly basis.

Band Plan

The board has voted to include non-digital segments in the digital band plan. The NCPA will not be doing band planning in the non-digital segments, this is just recognition of other band usage.

The digital band plan will continue to list digital frequencies individually, but non-digital will be listed mostly as segments—similar to the ARRL suggested band plan listing.

Every effort will be made to make the listing complete and accurate, but there may be some adjustments as new information comes in.

It is hoped this additional data will make the digital band plan more useful to the users in that the one document will give a better picture of various activities. Also, it will make a good reference for the board when trying to decide on any new digital segments.

We expect to have this pretty much done in time for Pacificon '99.

SMC

For those who haven't heard, the Spectrum Management Committee died in the crib. NARCC pulled out rather abruptly with dubious reasoning. Since the SMC needs the cooperation of all major players in the region and NARCC is a major player, the SMC was effectively gutted.

This is really unfortunate—the region would have benefitted from having a unified band planning committee.

There has been some talk about trying again, with perhaps SHARKK representing repeater interests, but this is just an idea. If anything more comes of it, I'll let you know.

70 cm Digital

For a very long time there has been talk about establishing a badly needed digital sub-band at 70 cm. Currently, there is only one widely recognized digital frequency at 70 cm in this region, 441.50 MHz.

After much negotiation, deliberation, and searching for a good sub-band, it seems we are now extremely close to finally having at least one digital sub-band at 70 cm. The most likely segment as of this writing would start at 433.0 MHz and end 434.0 MHz.

In years past, NARCC's 70 cm coordinator put digital users in this segment on an individual basis. The fact that the vast majority of current digital operations already takes place in this segment made it a highly likely candidate as a digital sub-band.

So far, the only objection to this segment is that some (very little) ATV activity exists with a carrier at 434.0 MHz. Such an ATV signal covers from roughly 433.0 to 439.0 MHz. This does not follow the ARRL band plan. There is an ATV segment from 438 to 444 mentioned in the ARRL band plan, but NARCC has repeaters assigned there. I'm told NARCC originally had ATV go

to 434 MHz. I find this is rather odd since it was also NARCC that originally put digital users at 433.x MHz.

It seems there is only one significant ATV presence at 434, an ATV repeater near Stanford. The repeater operator said there are multiple inputs, 434 MHz is still there only for the "legacy" users (a few remaining "sticks-in-the-mud" with older equipment). He further said that there are very few legacy users and they rarely check in on that input.

The 70 cm band is heavily used, and in my opinion, it's a very bad idea to reserve so much band width—a whopping six MHz—for such light and sporadic usage.

However, in my mind, there is a MUCH more compelling reason for ATV to stop activity at 434 MHz—it puts the ATV signal smack-dab on the internationally recognized satellite sub-band at 435.0 to 438.0 MHz! When this was mentioned to the ATV guys, they mumbled something about not using it when satellites are overhead. I may be wrong about this, but I seriously doubt they go so far as to track all amateur satellites that use 70 cm and shut down when one is above the horizon. That claim is even more questionable in the case of regularly scheduled ATV nets.

Therefore, I am pushing for the new 70 cm digital segment to be 433.x and to *not* recognize ATV at 433-438 MHz. Every indication is that this would affect *very* few ATV people anyway. If anyone has other information or comments about this proposed digital assignment, please let me know.

General Meeting

We plan to once again have our general meeting at Pacificon '99. It isn't confirmed yet, but as of this writing it will be Oct 17, Sunday afternoon in the Sunvalley room at the Concord Sheraton. Stay tuned....

EOF

AA4RE BBS Program versus Y2K

by Mike Fahmie, WA6ZTY

The AA4RE BBS program was written by Roy Engehausen (AA4RE) in the mid '80's and was regularly maintained and updated until mid 1994. It is currently used by many of the PSNC BBS's (N6EEG, W6CUS, WA6YHJ, KD6JZZ, N6CKV, W9HGI, W6SF, & KD6DG; to name a few) and a large number of packet BBS's worldwide. I have used it here at N6EEG for about 6 years and like it very much.

Some of you may have noticed the packet bulletin that Fred, K6RAU, wrote about the Y2K weaknesses that he found in the MSYS BBS system a few months ago. It seems that MSYS handles the millennia by incrementing from '99 to '100, not such a bad thing you might say, but that third digit just doesn't fit into the YYMMDD header format used throughout the BBS world.

Reading of Fred's discovery, I became curious about how the AA4RE software would fare come next January. Due to a chance meeting with another ham at the Dayton Hamvention 3 years ago, I came into possession of a copy of the PASCAL source code for Roy's BBS program, all 3.5 megabytes spread out over 333 separate files. Wow, there was a lot more to this than I had ever imagined and I had not worked with PASCAL before.

I searched the source code for keywords such as; time, 19, 99, date, year, month, leap, etc..., eventually compiling a list of functions and subroutines that dealt with the mechanics of time keeping and the programs that called upon these services. Roy used three different formats within his program to relate it to time/date;

1.) DATETIME is a BORLAND

PASCAL datatype provided by the compiler that provides an array of integers for year, month, day, hour, minute, second, dayofweek. This is the format used when a program asks the operating system for date/time services, such as reading the CPU calendar chip. The compiler documentation states that its routines will work until 2099 or so.

2.) YYMMDD/HHMMSS, an ASCII string format used to relate time to a BBS user or for use in a BBS message header, example 990208 is February 8th of 1999. YY is assumed to be 19YY.

3.) Roy's internal format for time is a 32 bit LONG INTEGER format that indicates the number of seconds that have passed since January 1, 1980. This is the format that is used for most all of the important timekeeping tasks in the program. This should work fine until about 2132 when the 32 bit value overflows.

In the course of operation, it is necessary to frequently go from one format to another, so Roy wrote a collection of sub-routines to translate any one of these formats into the others and it is here where most of the weaknesses lie. Since the YYMMDD format uses only 2 digits to relate a 4 digit year, the translation routines assume the missing two digits are "19" and dutifully append those digits to the two provided ones to produce a 4 digit year. That worked really well, at least until now.

Imagine what happens on Jan 1, 2000 when 00/01/01 is translated into Roy's LONG INTEGER format...lets see, the year 2000 represents about 631 million seconds since 1980, but since the program assumes that all years begin with 19, it will try to calculate the number of seconds in -80 years (1900-1980) instead of in +20 years (2000-1980)! That comes to about -2.5 billion seconds! Want to know what happens when the rest of the program sees negative seconds? Just try writing a check to the I.R.S. for -\$500 to pay off

your income tax in April. Tests have shown that the BBS program will begin generating error messages within seconds of the New Years fireworks, and become non functional almost immediately.

Since Roy left packet a few years ago he is no longer maintaining the program, a friend and I have undertaken the task of making it Y2K compliant. We have meticulously searched through the code and believe we have found and updated all of the non-compliant programming. Unfortunately, we were unable to make it immortal due to various existing limitations, but it should now run well from 1990 to 2090.

An alpha version is currently undergoing tests and will be released free of charge to the amateur community as soon as we have convinced ourselves that everything is in order. This release will also rectify a compiler bug that caused the BBS to crash on faster processors (>166 MHz Clk.).

EOF

APRS move to 144.39

The APRS move to 144.39 has been very successful. Most of the high-level digi's in California made the move (only a couple went off the air instead) and coverage works great! No more turning the frequency knob on long trips!

The current concern is that it works *too* well. Most of the high-level sites are now running the WIDE n-n code, which allows stations to simply specify how many hops they want from the high-level sites...the Digi's then perform call sign substitution, try to reduce duplicate packets (avoiding some LAN-level collisions), and propagate the packets 'far and wide'. Boiling it down, California is starting to look like a congested LAN again as north-end

Northern California Packet Association

packets go south and south-end go north, and messages start to take a long time to get ACKs back.

There is a message on the CA-APRS mailing list (aprs@lists.monterey.edu) which recommends some of the things we learned before, living in a Digi-rich area, including use of a local, explicit digi-path for most folks with mobile trackers, and using the APRS.NET java-based web browser for APRS to monitor for folks outside our local areas. (After all, how many folks in Riverside want to see someone's tracker packets from Eureka as is sits in the driveway overnight?) Ours is a problem of abundance, and we're using the Internet, and printed media to help educate the masses on how to better use the bandwidth we have.

Dave Harris, N6UOW

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ARRL COMMENTS ON CENTRAL STATES PETITION

In comments to the FCC, the ARRL says it supports the objectives of the Central States VHF Society's recent petition to formally segregate wideband and narrowband modes on VHF and UHF. But, the League says, the Society's petition fails to make a case to implement any new FCC rules. The petition, filed in June, would amend FCC rules to eliminate interference from FM and packet in the so-called weak-signal portions of the 6 meter, 2 meter, 1.25 meter, and 70 cm bands. The FCC has assigned RM-9673 to the CSVHFS petition.

In its comments, the League said it generally supports the intent of the petition but "does not support the regulatory relief requested" because the

Packet Sysops of Northern California Packet Bulletin Board Systems

August 1999

Call-SID	Location	User Ports
-----	-----	-----
WH6IO	Benica	144.99, 145.71&+, 145.75&, 433.43&+
N6EEG	Berkeley	144.97
KE6I	Berkeley	145.71&
KM6PX-1	Citrus Heights	145.07, 441.50
WA6YLB	Exeter	145.69
N6QMY-1	Fremont	144.31, 441.50
N6CKV	Gilroy	144.99
N6LDL	Los Gatos	144.97, 145.71&, 441.50
WA6NWE-1	North Highlands	144.93, 145.09, 145.75, 441.50
KD6DG	Redding	145.09
WD6CMU	Richmond	144.97
W6CUS-1	Richmond	145.63
W6PW-3	San Francisco	144.99
N0ARY-1	San Jose	144.93, 433.37&
KB6MER-1	San Jose	145.73*
N6DBZ	Sebastopol	145.07, 441.50&
KD6JZZ	Sonora	144.97
WA6EWV-1	South Lake Tahoe	144.97
W6YX-9	Stanford Univ	145.75+
W6SF	Stockton	144.99
K3MC	Sunnyvale	145.75+
K6MFV	Walnut Creek	144.31, 145.71&+
K7WWA	Willits	144.31, 145.69
KE6LW-1	Yuba City	145.63, 441.50

Keys:

& = 9600 Baud Port
+ = TCP/IP Port
* = Currently Inactive

petition doesn't spell out the extent of the interference problem. The League said the number of complaints of harmful interference to narrowband, weak-signal modes it typically sees doesn't justify additional regulation—although the ARRL conceded that the actual number of incidents might be higher than

complaints to ARRL HQ would indicate. The League said it prefers "reliance on established voluntary band plans" coupled with "some Commission support" to address the CSVHFS concerns. The ARRL took the opportunity to again call on the FCC to acknowledge "that VHF and UHF operation in accordance with established

band plans is 'good amateur practice'" and it urged the Commission to support compliance with band plans to prevent interference to weak-signal operations.

The League said it shares the Society's concerns about wideband FM and packet QRM to weak signal work but suggested that new regulations could stifle flexibility in the Amateur Service rules. The ARRL said it would rather see reliance on "the self-regulatory abilities of the Amateur Service, as reflected in voluntary band plans" than new FCC regulations.

The League suggested educational efforts as an appropriate remedy for newcomers and others unfamiliar with these amateur conventions.

A copy of the League's comments, filed July 28, is available on ARRLWeb at <http://www.arrl.org/announce/regulatory/csvhfs.html>.

From *The ARRL Letter*, August 13, 1999

EOF

Minutes of Annual Meeting, 1998

Held at Pacificon '98 October 18, 1998
Sheraton Hotel, Concord

Called to order at 2:09 PM by president, Gary WB6YRU.

We don't have a quorum. Since the ARRL forum is still in progress, it was decided that we reconvene after the forum.

Reconvened at 2:45 PM. Attendance: N6HM, WA6ZTY, WB9LOZ, W6RGG, K6CDO, W6BNG, KE6LW, WB6YRU, KM6PX, KH6JUZ, K6HLE, KD6FJI, KJ9U, N6UOW. (We now have a quorum.)

MEETINGS

The last general meeting in the South Bay was not very well attended. N6HM: motion to change the bylaws to allow having the general meeting at Pacificon. The consensus was this should be done, but a change to the bylaws requires advanced notice to the membership. This issue will be voted on at the next general meeting.

It was decided we explore further the idea of having meetings via teleconference/internet. K6CDO will look into it further and report back.

ELECTION OF DIRECTORS

Roy KA6EYH (not present) previously stated he would stay on as director and treasurer. Mel W6BNG, Howard N6HM, Dave N6UOW, Don K6CDO, Bob W6RGG, and Gary WB6YRU each wanted to stay on as director. New nominations: Barry Barnes (BBS) KE6LW.

W6RGG: motion to close nominations, seconded and passed.

Vote to approve the slate of directors: 13 in favor, 1 against.

The new directors are: Mel Gregonis (BBS) W6BNG; Don Root (Emergency Com.) K6CDO; Roy Wysling (BBS & TCP/IP) KA6EYH; Howard Krawetz (Keyboard) N6HM; Barry Barnes (BBS) KE6LW; Bob Vallio (DXPSN) W6RGG; Dave "Zonker" Harris (APRS) N6UOW; Gary Mitchell (BBS) WB6YRU

BAND PLANNING

WB6YRU: recap of what happened with NARCC and the SMC (Spectrum Management Committee) and that we found NARCC difficult to work with. As to proceeding with allocations at 70 cm, some research is already in progress (ATV, SHARKK). K6CDO suggests also finding out what So. CA is doing with digital at 70 cm.

KM6PX gave a brief summary of SHARKK. One idea is to form a new band planning organization, something like what the SMC was going to be. This could even take the form of a merger with SHARKK.

W6RGG: motion to look into working with SHARKK, etc. to form a SMC of some kind independent of NARCC. Approved unanimously. Consensus is to go ahead with allocating at least one digital segment at 70 cm, probably a one MHz bandwidth segment at 433 MHz.

COORDINATION

WB6YRU, N6HM: reviewed board's vote to not do any digital coordination. The only digital segment that isn't coordinated by one of the packet special interest groups is the relatively new 219-220 MHz segment.

N6HM: motion that NCPA contact the ARRL and work toward the goal of being the designated coordinator of 219-220 MHz in this region. Motion passed unanimously.

INTERNET/PACKET

Discussed the new packet network idea--merging packet (especially BBS) with the internet. KM6PX mentions he might be willing to do the programming, but there are problems with the whole idea. The main thing is usage of the BBS network is down and merging it with the internet may not be enough to entice users back. KH6JUZ says low speed is one of the biggest problems with packet today and he is ready to put in equipment for a minimum of 19.2 kbaud if only there was room for it at 70 cm. He says a 100 kHz bandwidth channel would be fine.

K6CDO: motion that the NCPA pursue this new network idea and work toward higher speed activity. Passed unanimously.

Adjourned 4PM.

EOF

NCPA board of Directors Electronic Meeting

Excerpts of the NCPA board remailer traffic, September 6, 1998 through June 17, 1999. Compiled by Gary Mitchell WB6YRU (full text of traffic is available).

Sep 6, 1998

Gary Mitchell, WB6YRU:
The NCPA will hold a general meeting at Pacificon '98 in Concord

(August 1998 version of Packet Band Plan was posted)

Sep 9, 1998

cross-post from netsig@tapr.org:
Tim KA5RYF suggests faster packet is fine, but what's really needed is better features and plug & play software. Also, packet needs to have some of the features of the internet.

Sep 12, 1998

Gary Mitchell, WB6YRU
On the subject of making packet more interesting--specifically having it work with the internet, the FCC regulations on content are a problem. Here's an excerpt from TAPR's NETSIG remailer:

David Rush:

I'm also concerned about the content coming from the Internet. I'd love to have a free-flowing gateway, but I'm not thrilled about the prospect of my call sign being on the first hop off the Internet when profanity and commercial stuff starts flowing through.

If packet is to move forward with something like this, the content restrictions need work. The FCC already moved in that direction recently, limiting liability to the first BBS in a forwarding chain. However, I believe it's still too restrictive.

Sep 27, 1998

Howard, N6HM:
About allocating one or two digital segments at 70 cm... I think its time we have a meeting and select some UHF frequencies and publish our intentions to coordinate them and get them in place.

Oct. 1, 1998

Dave "Zonker" Harris, N6UOW:
There is some talk in the APRS community about the need for a 9600 baud UHF channel.

Oct 3, 1998

Gary Mitchell, WB6YRU:
The independent Spectrum Management Committee effectively died when NARCC pulled out. NARCC's true motives weren't clear, but they tried to make it look like somehow it was NCPA's fault. So, we're back to allocating spectrum on our own.

Don Smith W6NKF:
NARCC has not pulled out of the SMC...NARCC has reorganized the committee....It is still a standing committee sponsored by NARCC.

Gary:
The SMC was *not* NARCC's to reorganize. It was an independent committee with NARCC, NCPA, and others as equal members. Unfortunately, such a committee needs participation from all the major players, NARCC has effectively killed it by pulling out.

Oct 4, 1998

Discussion about contacting other amateur organizations on frequency usage.

Mike Stickney KM6PX:
(Posted 70 cm band plans from various groups.)

I think the SMC is a good idea but needs to be totally independent from any coordination body.

To say that NARCC *or* NCPA is going to "create" this body is like asking the fox to guard the chicken coop.

(Mike describes how the SMC should be made of representatives.)

Gary:
That's how the SMC was supposed to be. (Describes some of the history of this issue.)

(Discussion about some of mechanics of allocating channels in 70 cm.)

Oct 9, 1998

Gary Mitchell, WB6YRU:
Howard N6HM just informed me that Pacificon has a free table available for two or three clubs. We won't have room for the demo's that we had in previous years, but it will be enough for handouts etc.

Oct 11, 1998

Gary Mitchell, WB6YRU:
(Gives notice of NCPA meeting at Pacificon, includes agenda.)

Oct. 20 1998

Gary Mitchell WB6YRU
(Posted minutes of NPCA meeting.)
The new board now has to elect officers

Zonker Harris:
I'll toss my hat in for Secretary....

Don Root:
I am willing to continue as Newsletter Editor.

Gary:
The candidates for NCPA officer positions so far:
President: Gary Mitchell WB6YRU
V.P. (still open)
Secretary: Dave "Zonker" Harris N6UOW
Treasurer: Roy Wysling KA6EYH
Editor: Don Root K6CDO

The newly elected NCPA directors are:
Mel Gregonis (BBS) W6BNG
Don Root (Emergency Com.) K6CDO
Roy Wysling (BBS & TCP/IP) KA6EYH
Howard Krawetz (Keyboard) N6HM
Barry Barnes (BBS) KE6LW
Bob Vallio (DXPSN) W6RGG
Dave "Zonker" Harris (APRS) N6UOW
Gary Mitchell (BBS) WB6YRU

Nov 9, 1998

Zonker Harris N6UOW:
The General Membership of TASMA approved a motion to designate 144.390 MHz for APRS.
The Oregon Region Relay Council went to 144.390 MHz last June for APRS.

Nov 10, 1998

Gary Mitchell WB6YRU:
The FCC is undergoing a biennial review of Part 97 (WT Docket No. 98-143).

The Downlink

(Posts draft of comments to FCC regarding restrictions on 219-220 MHz usage. (Consensus is that it looks good as is and it should be sent in.)

Dec. 20, 1998

Don K6CDO is willing to run for V.P.

Slate is:

President: Gary Mitchell WB6YRU
V.P. Don Root K6CDO
Secretary: Dave "Zonker" Harris N6UOW
Treasurer: Roy Wysling KA6EYH
Editor: Don Root K6CDO

Dec 21, 1998

Discussion about allocation of 433.0 - 434.0 MHz to digital, ATV, and other segments.

Dave Harris:

My contact advises that the Bay Area hosts three ATV groups: Mt. Diablo Output at 427.25MHz. Channel width 426.00 to 432.00. W2NYC (EX WD6GYH) San Jose, Same as above. Black Mtn. SUARC at 434.00MHz. Channel width 432.75 to 438.75

Gary:

One reason for targeting 433.x is because the vast majority of 70 cm digital is already there...been there for years. 432.0-432.75 is for weak signal 435 to 438 is satellite only (international)

Howard N6HM:

Crystal Peak ATV is on 426.25 MHz

Zonker Harris N6UOW:

The technical coordinators for the Black Mountain site says the 430 input is retained for "legacy users."

Ray Riordan:

I'm on the Black Mtn. ATV repeater. There is very little traffic on the 434 MHz input. Most of the users are on 1.2 GHz and some on 10 Ghz.

Zonker Harris N6UOW

This is from WF6R regarding the 434 ATV input:

*So, it seems that we don't want to step on the Weak Signal folks, and that the current allocations actually *are* at 433.xxx, and has been for a few years now. The international allocations for satellite are*

reportedly at 435.0-438.0, also overlapping with the 434 channel.

I make no effort to explain our use of 434 MHz. It's just the frequency we were told to use by NARCC back in the early '80s when the system went on the air. The 434 input has been troubled by digital users for years who never checked to see if anyone else was using that channel. Typically, ATV was not active during satellite passes. The biggest digital offenders were users of the Stanford digipeater. Oddly, Stanford also sponsors the Black Mtn ATV machine.

There are only a few people left using the 434 input. As I said earlier, its only there for the geezer factor, older folks who want it there because its "always been there" so the machine still listens to 434.

Gary:

It sounds to me like what we've got here is a staggering six MHz wide segment reserved for almost nothing.

I believe that no matter what segment we pick, there's always going to be someone who will gripe. The best we can do is pick a spot with the least number.

Also, the interference to their 434 ATV input comes from their own BBS...I just find that amusing. :)

Dec. 23, 1998

All of the directors voted yes to the slate of officers:

President: Gary Mitchell WB6YRU
V.P.: Don Root K6CDO
Secretary: Dave "Zonker" Harris N6UOW
Treasurer: Roy Wysling KA6EYH
Editor: Don Root K6CDO

Jan 1, 1999

Gary Mitchell WB6YRU:
Larry W6OMF (pres. Western States Weak Signal Society) reports interference from packet on 222.14. The stations are W6GO and N6TR. Those are both DXPSN. The weak signal people pretty much follow the ARRL's suggested band plan, which shows 222.0 - 222.15 as weak signal.

Jan 3, 1999

Gary Mitchell WB6YRU:
Currently, the digital band plan only lists digital frequencies. I propose it be expanded to recognize non-digital segments as well.

(Discussion followed--all comments were positive.)

Feb 3, 1999

Vote to recognize non-digital band segments in the digital band plan

5 Yes

0 No

1 not voting

Motion passes

Feb. 4, 1999

Don Root K6CDO:

Call For Articles for the NCPA Downlink. Deadline is February 15.

Feb 12, 1999

Gary Mitchell WB6YRU:

Treasury is low, what about maybe raising dues to \$15 per year? Our treasurer, Roy KA6EYH will be moving out of the area soon. Howard N6HM has agreed to take over as treasurer.

About digital sub-band at 70 cm... Can we agree that 433.x is the primary segment to consider?

About 222.14 MHz... PSNC indicates no BBS's on 223.68. We could re-allocate 223.68 from BBS to DXPSN Forwarding so those two DX stations can move off of 222.14.

(More discussion about ATV & satellites from 433 to 438.)

Feb 14, 1999

Mike Fahmie WA6ZTY:

There is an ATV station in San Rafael CA that operates 24 hours/day transmitting NOAA/NASA photographs. His video carrier is on 433.25 MHz so his signal occupies 432 MHz to 438 MHz.

Gary:

Hey, that sounds like *broadcasting* to me!

Feb 22, 1999

R. B. Vallio W6RGG:

I propose that the DXPSN be granted NCPA sanction to use the frequency of 223.68 MHz for backbone connections between various nodes within the NCPA jurisdictional area. This move will allow DXPSN to remove any links now active on 222.14 MHz.

Vote to release 222.14 to weak signal (from digital):

Northern California Packet Association

6 Yes
0 No
1 not voting
The motion passes.

Feb 28, 1999

Gary Mitchell WB6YRU
Roy KA6EYH is resigning as treasurer effective March 15, due to the fact that he'll be moving out of the area. Nominations are now open for a new treasurer. Howard N6HM has already offered to take the office.

March 4, 1999

Bill Edmondson reports his check for dues hasn't cleared (been 3 months)

Vote for Howard N6HM to take over as treasurer:

5 Yes
0 No
2 not voting
Congratulations Howard!

March 7, 1999

Vote to re-allocate 223.68 to DXPSN backbone:

5 Yes
0 No
2 not voting
The proposal passes.

The DXPSN is hereby requested to ask their two stations on 222.14 to move their forwarding activity to 223.68 at their earliest convenience. Reportedly a node is involved which is not practical to get to until the snow melts. We understand this may cause a delay on the order of months.

April 17, 1999

Gary Mitchell WB6YRU:
NCPA web page has changed (again) it's now <http://www.n0ary.org/ncpa>

Sorry about yet another address change. Hopefully, it will stay this way for a while.

May 11, 1999

Gary Mitchell WB6YRU:
Has anyone heard from our new editor, Don Root K6CDO lately? The Downlink is over due now and I haven't been able to get through to him. (Here we go again.)

May 30, 1999

Gary Mitchell, WB6YRU:
Let's get started on the expanded band plan

(satellite sub-bands are listed)

Carol A Byers:
(extensive list of satellite frequencies)

Gary:
Except for the 144.30 - 144.43 segment, the list I gave and the one Carol has given appear to be the same.

Discussion about 144.30-144.50
Carol questions digital allocations here.
Gary talks about the history behind this.
Cap Pennell posts information about how AMSAT was involved with the move of APRS to 144.39 from 145.79.

June 2, 1999

Gary Mitchell, WB6YRU:
I've recently been in contact with the president of WSWSS (Western States Weak Signal Society). He has confirmed that the following list is pretty much accurate and complete as far as weak signal is concerned. They consider all SSB and CW to be weak signal.

(Posted list of weak signal frequencies)

June 5, 1999

Vote to accept listed satellite frequencies:
Five YES
Zero NO
One not voting
The motion passes.

Gary Mitchell WB6YRU:
(Posted list of simplex frequencies, asked for corrections).

Bob W6RGG:
> 146.42 - 146.56 simplex
Should be 146.415 - 146.565 and they are channels at 15 kHz spacing.

> 147.42 - 147.58 simplex
Should be 147.405 - 147.585, same 15 kHz spacing.

Bob also pointed out that there is a DXPSN station on 146.595. This frequency is not in the packet band plan, but is noted in the Repeater Directory as a simplex channel.

Bob Wilkins N6FRI:
You may want to consider 441.000 as FM simplex (mostly remote bases) in Northern CA

June 16, 1999

Vote to accept list of weak signal frequencies:

Five YES
Zero NO
One not voting
The motion passes.

Gary Mitchell, WB6YRU:
(Posts updated simplex list)

146.595 is reportedly used locally by some DXPSN stations. Do we want to consider it digital or simplex? Does anyone know of any simplex activity there?

Cap Pennell:

There's been considerable talk about using 53.530 for APRS on the national APRS email mailing list.

Gary:
Isn't that a bit close to 53.52?

June 17, 1999

Bob Vallio W6RGG:
I recommend that 146.595 be listed as digital.

Zonker Harris:

If 146.52 is National Calling, and channel spacing is 20 kHz...then the 146.595 frequency is off-frequency.

Bob W6RGG:

The first "channel" above 146.000 is 146.010; and all channels higher in frequency are spaced 15 kHz apart. Somewhere down around 145.010, I think, is where the 20 kHz spacing starts, but I truly don't know where it ends.

Robert Wilkins N6FRI:
(Gave some history behind 146.595.)

(Discussion follows about channel spacing in regards to 146.595)

Steve Grajeda, WB6YQP:

The Oregon Region Relay Council, Inc (ORRC) has been using 10 KHz steps on packet radio for about 6 years now. We have found it very effective and we use 4 KHz deviation max. This way we are able to accommodate many more nodes on LAN frequencies.

EOF

NCPA's Comments to FCC Regarding 1998 Review of Part 97

The FCC initiated a review of Part 97, WT Docket 98-143. Many amateurs sent in comments, mostly having to do with CW testing requirements and how many license classes there should be. The NCPA took the opportunity to comment on another section of Part 97 that seemed to be poorly written. Below is the text of that comment.

At this time, there is no word on the status of the review, nor on whether the FCC is even considering our comment. If nothing comes of this, the NCPA will consider submitting to the FCC a similar document for proposed rule-making. If anyone has any comments about this, feel free to mention it to any board member or on the NCPA remailer.

Before the Federal Communications Commission
Washington, D.C. 20554

In the Matter of) WT Docket No. 98-143
)
1998 Biennial Regulatory Review)
Amendment of Part 97 of the)
Commission's Amateur Service Rules.)

97.303(e) paragraph five is flawed and needs revision; too much authority is given to AMTS.

Currently, Part 97.303(e) paragraph five reads:

No amateur station may transmit in the 219-220 MHz segment from a location that is within 80 km of an AMTS Coast Station unless the amateur station licensee holds written approval from that AMTS licensee.

It appears that the FCC is abdicating its authority here. To our knowledge, there are no other cases where a private license holder has absolute veto power over another user or service on frequencies that they may not even share.

An AMTS station has no incentive to grant permission. And experience has shown that they are motivated to deny permission, even if they would not be affected either way.

The main reason for changing this law is that it currently gives AMTS stations authority over the whole band segment, regardless of their usage. An AMTS licensee could be on only one channel at the lower end of the 219-220 band, yet still be able to deny permission to amateur activity on only one channel at the other end of the band! If the channel were shared, an argument could be made for requiring permission from the primary channel user (AMTS), but that's not necessarily the case here. An AMTS station should not have any say over frequency usage far removed from their channel.

It is highly recommend 97.303 (e) paragraph five be changed to read:

No amateur station may transmit on *the same frequency* in the 219-220 MHz segment as an AMTS Coast Station from a location that is within 80 km of that AMTS Coast Station unless the amateur station licensee holds written approval from that AMTS licensee.

Existing restrictions on RF spilling over into adjacent channels should be adequate. However, it would be acceptable to have an added specification that permission might be required if the amateur station transmissions are noticed by the AMTS station or if more than a certain amount of power from the amateur station appears on the AMTS frequency.

Approved by the NCPA Board of Directors,

Gary Mitchell, WB6YRU
NCPA President

Northern California Packet Band Plan

August 1999

50 MHz

50.60-50.80 (20 kHz channels, non-specific at this time)
51.12 SCA backbone
51.14 BBS
51.16 Keyboard to Keyboard
51.18 Experimental
51.62 Forwarding DX Cluster
51.64-51.68 (20 kHz channels, non-specific at this time)

144 MHz

144.31 BBS
144.33 Balloon & experimental
144.35 Keyboard to Keyboard
144.37 BBS LAN forwarding
144.39 APRS (U.S. and Canada)
144.41 duplex, lower half (145.61 upper half, 1.2 MHz split)
144.43 TCP/IP (OK to run duplex with 145.65)
144.91 Keyboard to Keyboard
144.93 BBS
144.95 DX Cluster
144.97 BBS
144.99 BBS
145.01 User access
145.03 Keyboard to Keyboard
145.05 Keyboard to Keyboard
145.07 BBS
145.09 BBS
145.61 duplex, upper half (144.41 lower half)
145.63 BBS
145.65 TCP/IP 9600 bps (OK to run duplex with 144.43)
145.67 DX Cluster
145.69 BBS
145.71 9600 bps
145.73 BBS
145.75 TCP/IP
145.77 DX Cluster
146.58 DX Cluster

NOTES:

- Allocations from 144.31 through 144.43 are relatively close to the weak-signal sub-band, so watch your deviation.

220 MHz

219.05-219.95 100 kHz channels, Backbone
223.54 LAN
223.56 LAN
223.58 LAN, Gilroy (GARLIC)
223.60 LAN, Sacramento Valley (SACVAL)
223.62 LAN, South Bay (SBAY)
223.64 TCP/IP
223.66 Keyboard to Keyboard

223.68 DX Cluster Backbone
223.70 LAN, Monterey Bay & North Coast (MRYBAY)
223.72 LAN, North Bay (NBAY)
223.74 Backbone, DX Cluster

NOTES:

- 219 channels are by coordination only. There are currently political problems with using 219-220.
- On 223.58, TCP/IP interlink (Sacramento) is secondary, not to interfere with node uplink.
- 222.14 was recognized as weak signal and the existing DX spotting stations moved to 223.68 on March 7, 1999. At the same time, 223.68 was changed to DX Backbone.

440 MHz

433.15 BBS backbone (by coordination only)
441.50 Any

More 70 cm packet channels are currently being investigated, possibly 433.x and 438.x MHz. Contact the NCPA for details.

900 MHz

903.500 1 MHz wide, TCP/IP
904.500 1 MHz wide, TCP/IP
915.500 1 MHz wide, experimental
916.100 200 kHz wide, experimental
916.300 200 kHz wide, experimental
916.500 200 kHz wide, experimental
916.650 100 kHz wide, experimental
916.750 100 kHz wide, experimental
916.810 20 kHz wide, experimental
916.830 20 kHz wide, experimental
916.850 20 kHz wide, experimental
916.870 20 kHz wide, experimental
916.890 20 kHz wide, experimental
916.910 20 kHz wide, experimental
916.930 20 kHz wide, experimental
916.950 20 kHz wide, experimental
916.970 20 kHz wide, experimental
916.990 20 kHz wide, LAN links (Contra Costa County only)

900 MHz activity is on a non-interference basis to vehicle locator service. This sub-band is not considered suitable for omnidirectional systems, use for point-to-point links only.

1296 MHz

1248.500 1 MHz wide, experimental*
1249.000-1249.450 Unchannelized, experimental
1249.500 100 kHz wide, experimental
1249.600 100 kHz wide, experimental

1249.700 100 kHz wide, experimental *
1249.800 100 kHz wide, experimental*
1249.870 20 kHz wide, experimental
1249.890 20 kHz wide, DX Packet Cluster
1249.910 20 kHz wide, experimental*
1249.930 20 kHz wide, experimental*
1249.950 20 kHz wide, experimental*
1249.970 20 kHz wide, experimental*
1249.990 20 kHz wide, experimental*
1250.500 1 MHz wide, experimental
1251.500 1 MHz wide, experimental
1297.000-1298.000 Unchannelized, experimental
1298.500 1 MHz wide, experimental*
1299.000-1299.450 Unchannelized, experimental
1299.500 100 kHz wide, experimental
1299.600 100 kHz wide, experimental
1299.700 100 kHz wide, experimental*
1299.800 100 kHz wide, experimental*
1299.870 20 kHz wide, North Coast LAN
1299.890 20 kHz wide, DX Packet Cluster
1299.910 20 kHz wide, experimental*
1299.930 20 kHz wide, experimental*
1299.950 20 kHz wide, experimental*
1299.970 20 kHz wide, experimental*
1299.990 20 kHz wide, experimental*

* Full duplex channel pairs at 50 MHz separation, example:
1249.970 ↔ 1299.970

Definitions

9600 BPS Stations using 9600 baud with direct FSK (G3RUH, TAPR, etc.) modems.

Backbone No uncoordinated stations. These channels are for specific purposes as defined by the NCPA and/or affiliated groups. These are frequencies where the various BBS, nodes, and clusters forward traffic and are very high volume channels. Please use the normal user entry points of the network you want to access rather than these channels.

BBS These frequencies are for user access to a full-service BBS. Keyboard-to-keyboard is tolerated. Please don't put high level nodes or digipeaters on these channels since they are *local*. A low-level direct link or node that links into a backbone on another frequency is the proper implementation.

Duplex Simultaneous transmit and receive by a single station, including digital repeaters. Duplex channels are intended for high-volume applications. 9600 baud or higher is encouraged, but not required at this time.

DX Cluster Northern California DX packet spotting network. No other activity should be on these channels.

Experimental Anything goes except full service BBS or any 24 Hr/Day services (nodes, gateways, etc). This is where you can test new gear, programs, etc. These channels will be reassigned in the near future, so no permanent activities please.

Forwarding same as *backbone*

Keyboard to Keyboard Anything but full service BBS, TCP/IP, or DX Cluster. Primarily chat channels. These are also the primary emergency channels.

Interlink same as *backbone*

LAN Local Area Network. BBS's are grouped into LAN's for more efficient forwarding. A LAN frequency is the forwarding channel within a LAN and to the backbone. Please do not attempt to access the BBS network on these channels.

Personal mailbox/maildrop A BBS-like system, often running entirely within a TNC, with a small number of users that handles information of a personal, local or special-purpose nature. A mailbox is allowed on keyboard-to-keyboard channels ONLY if it does not forward with other BBSs. Mailboxes may forward with full-service BBSs on LAN channels at the discretion of the BBS SYSOP.

TCP/IP Stations using TCP/IP protocol on top of AX.25. Some AX.25 tolerated to communicate to TCP/IP stations if a compatible p-persistence access method used.

User Access User access to a network. This is for the next generation of packet which is expected to operate like the internet. Users would access such a network on these frequencies. The load on these channels may be rather high, like BBS channels. The activity may be any combination of BBS, keyboard, TCP/IP, or other modes.

Procedure for changes

Send requests for changes to either the frequency coordinator or the NCPA board. The frequency coordinator will then present the request to the board along with suggested assignments. The NCPA board, elected by you, the packet user, makes all assignments.

Misc. Info.

Packet tends to splatter if the deviation is set too high. Please keep your deviation to less than 5 kHz.

NCPA currently does not coordinate individual stations, nodes, etc. leaving that to the special interest groups. BBS station coordination is done by the PSNC in Northern CA. Coordinations of an alternate BBS type network including keyboard and TCP/IP in the central valley is done by CVDRA. DX spotting is coordinated by DXPSN. Some digital is coordinated on auxiliary channels by NARCC.

The NCPA board conducts most of its meeting activity electronically by internet e-mail remailer, ncpa@qth.net. As with face-to-face board meetings, interested persons are welcome. Subscribe to the remailer by sending e-mail to majordomo@qth.net with "subscribe ncpa" as the message. Subscribing to the remailer is like attending a continuous NCPA board meeting.

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Northern California Packet Association

The NCPA fosters digital communications modes of amateur radio through education, band planning, and acts as an umbrella organization for various packet special interest groups. Your annual dues helps pay for this newsletter and other educational materials activities. If you might be interested in getting more involved, please let us know.

Call: _____ Home BBS: _____ e-mail: _____

Name: _____ Address: _____

City: _____ State: _____ Zip + 4: _____ Phone: _____

- New Membership Renewal Change of Address I'm an ARRL Member
 One year: \$10 Two Years: \$20 Three years: \$30
(make checks payable to NCPA)

Please indicate your area(s) of interest:

- BBS SysOp BBS User APRS NET/ROM TCP/IP High-speed packet
 DX Packet Spotting Network Keyboard to Keyboard FCC/legal issues Other:
-

NCPA *Downlink*

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First Class