NCPA Downlink

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Future of Amateur Bands in Jeopardy; NCPA Submits Formal Reply to FCC

Richard M. Shappee, WA5HQJ

In recent months there have been numerous articles in the newspapers concerning the "auctioning" of radio frequencies. This has been a major source of new income to the United States Government, with millions of dollars being paid for the frequencies that were made available to industry. You can be sure that "our" frequencies are being looked at as well and we must stay alert for every sign of an attack. We have already lost 2 MHz of our 220 band and that may be just the start. There is at present a concerted effort to take from us, as secondary users, frequencies in the 2.4 GHz range. This all began when Congress passed the Omnibus Budget Reconciliation Act of 1993. Shortly after, the National Telecommunications and Information Administration (NTIA) released its preliminary plan that directly spoke of our 2.4 GHz band. Subsequently, the FCC generated its Notice of Proposed Rule Making (NPRM.) At the NCPA Board of Director's meeting held on November 13, 1994, President Bob Arasmith, N0ARY asked Bruce Parens, AB6YM, to prepare a response from the NCPA to the FCC Notice of Proposed Rule Making concerning the 2.4 GHz band. The response is lengthy but worth reading to understand some of what is required to protect our bands. Part of what Bruce says is this: Regulatory impediments have served to prevent amateurs from digital experimentation and thus the 2.4 GHz band has not seen the use that would otherwise have been the case. Bruce goes on to say that the government's assumption of low usage is more of a gauge of the effectiveness of government in depressing spectrum use than they are estimates of the potential use of spectrum by amateurs.

Bruce suggests that should his proposal be followed that it would permit radio amateurs to contribute to the growth and development of new high technology jobs and economic growth.

NCPA Board meets February 12th. See page 11 for details.

He goes on to point out that there is a portion of the commercial television spectrum that is unused and that should be considered for reassignment and argues that amateurs should have equal status as a primarily allocated service rather that being a poor relative (editor's words.)

He reminds the government that the primary user of 2.4 to 2.45 GHz are the millions of microwave ovens. He talks about the inadequacy of band segments from 2400 to 2402 and 2417 to 2450 MHz and the faulty assumptions of the government that this would be adequate spectrum for amateur use. Their error was that they do not understand the difficulty of communication over the surface of the earth as compared to space to earth communications. In the first case, there is always a great likelihood of an interfering signal whereas there is not the same hazard between satellite and terrestrial stations.

Bruce thoroughly reviews the support for our argument for continued occupancy of the 2.4 GHz band and addresses the inadequacy of a secondary allocation, with this sometimes worse than no allocation at all with its attendant problems. It is essential that we remain vigilant and be prepared to defend encroachment into our bands. When the 'Wake Up Call' for the 2.3 GHz emergency appeared in QST regarding the NTIA preliminary Plan, only about 25 hams responded. So if you have a chance to give your opinion and if you think our bands are worth keeping, pick up your pen, fire up your word processor or call your elected representative to be sure your wishes are know. If you don't and I don't and if no one else does battle, we will surely lose our frequencies. If you would like a copy of our response to the FCC, let either Bruce or your editor know and we will see that you get a copy. EOF

In This Issue

Editorial

Richard M. Shappee, WA5HQJ
Downlink Editor

Well, it will be interesting to see how it all turns out. Being the new editor, that is. But first, let me join you in thanking Mike for his years of loyal service in this chair. And Mike, sorry for all the grief that you have had to endure in recent weeks. I am sure that it will be better from here on in. And as they say, yours will be a tough act to follow!

I probably should tell you a little about me and where I am coming from. I have been licensed for about 30+ years and first learned the code as a boy scout. And sometime I will tell you about Kenneth Holley, my Elmer. In addition to the International Morse, I learned the Continental Morse, should there ever be a demand for that language. And speaking of languages, I had the good fortune to learn computer machine language before there were compilers and now write code in most any language as a hobby. I am retired from the Northrop Corporation where I spent quite a few years in various manufacturing positions, mostly as Operations Manager. Prior to that I worked for a Teledyne company doing the same sort of thing. But I had an earlier life as an engineer, designing all sorts of gadgetry including seismic detectors for the detection of nuclear explosions and aircraft flight instruments. But that is all behind me and now, here I am, retired, as we say, playing radio and whatever else I want to do. Well, sort of. After all, it is a fixed income.

I have spent a little time being an officer in other clubs around the country as well as being a city councilman in Texas. I am the Secretary of a few organizations including the Mount Diablo Amateur Radio Club, its Rocky Ridge Repeater Group and also am Secretary of SIRARC, a group of retirees who are also members of SIRS. So far as editing a paper, I haven't done too much of that so far although I was the editor for the Engineer's Club in Houston, Texas a jillion years ago. So I will need your help as editor of the DOWNLINK in forgiving my errors, but more importantly, in helping me to find interesting articles for the DOWNLINK. I was planning to publish the By Laws this time, but Mike beat me to it. But I have put to print a few articles that you may find interesting. I think that the quality of what I have offered you could be better. So if you don't want to just read the minutes of meetings, the band plan, and history of packet, why don't you help me and our members and at the same time earn fame and fortune by writing for the club's magazine? Articles should be related to our common interest but until we get a bit further along, I would be willing to stretch things a bit if you have something really neat. So give me a call, send me a packet message, or write me a note. I will be waiting to hear from YOU!

So for now,
73 Richard WA5HQJ

The NCPA *Downlink*

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How APRS Came About

Bob Bruninga, WB4APR

This history was written in response to some grumblings originating in California questioning the origins of APRS. This bibliography chronicles only my development of APRS, and does NOT include DOZENS of other amateur publications and articles that I have authored for the benefit of amateur radio, the growth of packet, the development of packet HF modems, and the origin of SAREX. I am a life member of AMSAT, the ARRL, and AMRAD.

The Automatic Packet Reporting System (APRS) software has evolved over the last sixteen years of my involvement in amateur packet radio. For years, I was on the AMRAD board of directors, the Amateur Radio Reasearch and Development group that was instrumental in the original specification for AX.25 written by my good friend Terry Fox, WB4JFI and published by AMRAD in 1984. In 1978 I had built the first digital on the air automatic message system which became a dual port phone and packet radio BBS for the AMRAD group when ASCII first became legal in the late 70s [1]. Isolated without packet in Japan in 1982, I wrote my first data maping program, which took NAVY HF position reports off the air and displayed them on an APPLE-II computer.

From the beginning, I was always making packet maps of the growing packet network [3,5,6]. In 1983, I wrote a gateway/BBS program on my VIC-20 computer to permit simultaneous operation of both HF and VHF ports for exchange of packet messages and pioneered the use of 200 Hertz shift for packet onHF with cross-county links to W0RPK, W9TD, and K7PYK [2]. We used 10.149 MHz. To my knowledge, this was the first amateur HF BBS/GATEWAY; and it remained on the air 'round the clock for 5 years through 1989 under the FCC STA for automatic packet HF operations.

My APRS connectionless protocol idea was first used in a program I wrote on the VIC-20 for reporting the position and status of horses in a 100 mile cross country endurence run for which the AMRAD organization was always tinkering with new and better ways to use packet for public service [4]. I spent two years improving the idea for amateur packet radio support of the National Disaster Medical System exercises sponsored by FEMA [7,8,9]. During this time frame I called it the Connectionless Emergency Traffic System (CETS). At the end of the second national exercise I realized that the number of C-64 computers was dwindling and that I should rewrite the software for the new IBM PC that was entering the HAM community. I also began to integrate packet mapping into the program to add to the tactical usefulness. Throughout this time period, HAMS on the local repeater will recall my constant chatter about the need for a packet maping program. We were beginning to see street map software in the stores, but none of the off-the-shelf packages appeared to offer any hooks for the user to tie this maping software into packet radio.

During 1990 I got tired of trying to inspire someone else to find a source of maps and began to digitize the East Coast myself. I decided to do all the maps by hand and designed a map data format so that any HAM could draw a map for any local packet application using only a text editor. The idea was to "roll our own" so that as a HAM community, we could be self sufficient and develop maps for any application and share them within the community. Once that maping decision was made, APRS evolved daily as I began to play with it on the air, and realized its potential. Every idea that I could think of to facilitate communication using APRS was added to the program. For four years now, APRS has consumed thousands of hours of evenings and weekends as I tweaked the program and drew maps. This time does not include the many hours spent at the Naval Academy to modify the APRS concept to operate on the Naval Academy boats for summer cruises. In that environment, I had to modify APRS to operate on a fiber-optic Local Area Network, instead of the radio environment used in HAM radio. Throughout this timeframe, I have been preaching to the amateur community the tremendous potential for using packet radio networks (like APRS) for disaster communications and public service. APRS is 100% my own work. If someone else claims to have written APRS, then I sure would have liked to have known about it 10 years ago. It would have certainly saved me 4000 programming hours and a lot of grief from the family!

Finally, I am not doing this to make money on amateur radio! I ask for a registration contribution to help defray all the mailing costs and the psychological burden of having hundreds of HAMS all across the country call me at home at all times of the evening with repititious and continuous questions. I learned this lesson the hard way by releasing my C-64 BBS source code to the HAM community in 1984 for free. Now, 11 years later, I still get phone calls, letters without SASE's, and registered letters from third world countries (requiring a trip to the post office) asking questions about this obsolete software! The code has been so modified by hundreds of other people, that I can scarcely recognize it. Yet, folks expect ME to tell them why it doesn't work on their c-64 that they got for $5 at a local yard sale!.

The following is a bibliography chronicling the development of APRS:

1] MULTI-USER DATA NETWORK OVER VHF RADIO, Bruninga, AMRAD Newsletter, Mar 78.

[2] HF PACKETS, MODEMS and GATEWAYS, Bruninga, Third ARRL computer Networking Conference pg 6-7, 15 Apr 84. (HF packet specification for 200 HZ shift)

[3] EASTNET - AN EAST COAST PACKET RADIO NETWORK, Bruninga, p 9-11, Third ARRL Computer Networking Conference. 15 Apr 84. (First MD, NJ, NY, etc packet map)

[4] THE RACING PROBLEM: A PACKET SOLUTION, Bruninga, p 12-15, Third ARRL Computer Networking Conference, 15 Apr 84. (A connectionless protocol for reporting the location and status of Horses on a 100 mile endurence run *(the original APRS concept)

[5] EASTNET - A YEAR LATER, Bruninga p 15-24, Fourth ARRL Computer Networking Conference, 30 Mar 85. (More maps of the East Coast and the first USA HF map)

[6] LINKING PERSONAL COMPUTERS BY PACKET RADIO,

Continued on page 10

The History of Packet Radio on the West Coast

(Editor's note: In the last issue of the DOWNLINK we printed the history of west coast packet up to about April 1986, when automatic forwarding to Southern California and Arizona became a reality. Forwarding was taken from 145.01 MHz and moved to 223.58 MHz. We continue with the history, mostly from Don, NI6A but also from the memories of WB6ASR and WB6YMH. This material was received fom Mike, K3MC and slightly edited by Richard, WA5HQJ.)

At that time KR5S and NI6A maintained a list of what NTS operators were at what BBS and were able to handle NTS traffic to what States. This list was almost impossible to keep updated, but this ensured that NTS traffic would not be sent via packet to BBS's that could not forward them and thus be lost. This system depended on liaison stations from section or region nets to a "special nts" BBS in that State who would guarantee delivery or liaison to their section/region net. W6CUS-1 is still that BBS in California and has been since the beginning. Of course, educating the originators on what states could and could not be reached via packet was continuous.

KR5S and NI6A were the keepers of the only national BBS database that listed NTS state and section outlets as to BBS callsign. Those states that had no NTS BBS delivery outlets therefore could not receive NTS traffic via packet and this info was distributed to ALL BBSs. Of course in those days there were only 100 or so BBSs nationally. It became clear that automatic designators were needed.

All in all, we instituted a system wherein NTS traffic would not be delayed nor undelivered. We formed the first Northern California Sysop Association in 1985 and have ensured that NTS traffic only be forwarded to BBSs who GUARANTEE delivery. We were appointed Northern California Net Packet Manager in 1985 (Northern California is the Official NTS Section Net for Northern California according to ARRL).

The states of California (North and South) and Arizona became linked for automatic BBS VHF forwarding in the Spring of 1986. KE6BX BBS moved to 145.01 and started forwarding with WB7BNI BBS, KR5S BBS, and N6LUC BBS in Southern Cal. Shortly afterwards NK6K-1 took over and acted as the link to Southern California and to Arizona. About that time, W6IXU BBS became capable of WORLI automatic forwarding also, and joined the automatic linking. Please notice that the automatic forwarding between North and South took place almost 2 years after EastNet had accomplished their automatic forwarding from New England to the Mid-Atlantic. *[Note from K3MC: I know what Don is talking about; I had been running K3MC BBS in Pittsburgh, PA for quite some time, and had excellent coverage into the East Cost. In fact, my station was the first to link to Ohio, a Cleveland station, for passing traffic.]*

In early 1986, ntsxx (where xx was the state abbreviation) was agreed upon mainly because that's what the East Coast was actually doing at the time. They were passing nammy thousands of NTS messages up and down the coast automatically that way to GUARANTEED NTS delivery BBS (those BBS who had assigned NTS liaisons). BBSs who did not have assigned NTS liaisons were not to forward the traffic; this is because NTS wanted reliability.

By early late 1986, some people wanted to use zipcodes @ ntsxx. Some proposed to use area codes plus the first 3 digits (the exchange). Most sysops didn't feel a need for automatic designators at all, but the NTS operators wanted more specific routing designators that could be transferred automatically. After much national debate on all the major BBSs and in GateWay Magazine, it was decided and supported by the NTS area staffs (the policy makers of NTS), to accept the format "st zipcode @ ntsxx" by the beginning of 1987. The HF sysops at that time all agreed to support it. The national list that was kept by KR5S and NI6A then showed NTS outlets for all states on packet BBSs (albeit some had to be sent to an NTS state holding BBS for liason into regular NTS nets). This system was made possible by constant interfacing by NTS operators, BBS sysops, and WORLI, who, at that time, created software which could do two things that were before then impossible:

1) strip the @ ntsxx off automatically on incoming messages if the sysop so configured, so that the message could be automatically sent on its way by the TO field only.

2) Wild card zip routing so that sysops did not have to enter each and every zipcode in their forward file; so 94* would be sufficient to forward all zips starting at 94, if all 94xxx zips were to be forwarded to one bbs, etc.

This system basically was established in early 1987 after much hard work as a national volunteer system. It still requires a lot of cooperation, give and take, diplomacy, communication, and dedication.

This system is basically what we still have, except for a few problems. There are a few new sysops who refuse to cooperate with the linked system's requirements due to lack of understanding. Thus some traffic gets misrouted, or worse, traffic is held that never gets delivered. Some BBS do not even receive the ALLCAN or @ NCPA bulletins, thus they do not know what is going on in the linked system. *[K3MC's Note: I think things have improved since Don wrote this article in 1988!]*

The NTS/PACKET interface in California was developed in early 1985 at the W6IXU BBS for Northern and Southern California NTS interface. Automatic forwarding in California between BBS did not occur until late 1985 although HF GateWay forwarding began with KD6SQ-1 BBS in Southern California and W6CUS-1 BBS in Northern California in the Summer of 1985.

We recognized from the start that packet was not to violate the rule of reliability of NTS traffic. NTS traffic was only to be sent via packet to states and BBS with known outlets. To this end, KR5S and NI6A maintained the first and only national NTS/BBS database and many BBSs nationwide volunteered as Packet/NTS interface BBS. This database identified both the HF gateWay BBS callsign (which BBS to forward to on HF) and the callsign of the State designated VHF BBS which would accept the NTS traffic for interface into their section or region nets. Packet was seen as a relay means for NTS at that time primarily, and not as a delivery means, as the number and coverage of packet BBSs was not yet widespread.

Users needed to know what states could accept packet NTS meesages and which could not be relayed via packet. HF/VHF GateWay BBS sysops needed to know which BBS to send which NTS traffic to as most HF GateWays themselves had no NTS liaisons and many

were not linked up on VHF very far to any NTS BBS.

The following guide was primarily for the use of HF sysops before zip routing became standardized and all states had known outlets. SECTION designators did not need to be supported but were included only for reference. 5 digit zips sent @ the STATE or PROVINCE designator were sufficient.

Designator State/Section HF BBS Section BBS/Section Pkt Mgr.

1st Region

NTSCT* Conneticut WB1DSW,N1DL @ K1CE NTSMA* Massachusetts WB1DSW,K1UGM @ K1UGM NTSEMA Eastern Mass WB1DSW,K1UGM @ K1UGM NTSWMA Western Mass WB1DSW,K1UGM @ K1UGM NTSME* Maine WB1DSW,K1UGM @ N1AHH NTSNH* New Hampshire WB1DSW NTSRI* Rhode Island WB1DSW @ N1DKF NTSVT* Vermont WB1DSW,NA2B AE1T @ KD1R-1

2nd Region

NTSNJ* New Jersey W3IWI,W2JUP-4 NTSNNJ No. N Jersey W3IWI,W2JUP-4 @ WA2SNA NTSSNJ So. N Jersey W3IWI,W2JUP-4 @ KB1BD NTSNY* New York W3IWI,W2HPM,WB1DSW @ WA2RKN NTSNLI NYC-Long Is. W3IWI,W2HPM @ W2HPM,AI2Q NTSENY E. New York W3IWI,W@HPM @ WA2RKN,WB2QJA NTSWNY W. New York W3IWI,W2HPM @ W2ICZ,KC3BQ,NE2W

3rd Region

NTSDC* Dist. of Col. W3IWI,K8MMO @ W3IWI NTSDE* Delaware W3IWI @ WB3FFV NTSMD* Maryland W3IWI,K8MMO @ W3IWI NTSMDC Maryland-DC W3IWI,K8MMO @ W3IWI NTSPA* Pennsylvania AD8I,W3IWI @ AG3F NTSEPA East Penn. AD8I @ KB3UD NTSWPA West Penn. AD8I @ W2XO

4th Region

NTSFL* Florida K0KBY,K4TKU,K2AAA @ K0KBY NTSNFL North Fla. K0KBY,K4TKU @ K4OZS NTSSFL South Fla. K0KBY,K4TKU @ N2WX NTSGA* Georgia KI4XO @ WA4VMV NTSNC* No. Carolina W3IWI,K8MMO NTSPR* Puerto Rico KR5S (to KN7U NTS Voice/CW Net) NTSSC* So. Carolina WA4SZC,KI4XO @ KF4EF NTSVA* Virginia W3IWI,K8MMO,WB0TAX @ WA4ONG-10 NTSVI* Virgin Islands KR5S NTSWIN (U.S. Pssns Carribean) KR5S @ KR5S

5th Region

NTSAL* Alabama WA5DVV @ W4CUE,K4BFT NTSAR* Arkansas WD5B,N5WX @ N5WX,WD5B NTSLA* Louisiana WA5DVV,WD5B,KD5SL NTSMS* Mississippi WA5DVV,N4JS NTSOK* Oklahoma WD5B,N5WX,WB5FWE NTSTN* Tennessee KI4XO,WD5B NTSTX* Texas W5XO,WA5QZI,WA5MWD

ETC, ETC, ETC. This primitive method for early NTS/Packet forwarding required a tremendous amount of effort on the part of KR5S, NI6A and the other HF BBS sysops. This designator method is no longer used (nor needed) but it shows what can be done when national leadership is non-existent and when a few individuals get together to make the system function where no system existed previously.

Thank God for the newer software!

At this time no automatic forwarding designators were agreed upon nationally nor did W0RLI BBS support wildcard forwarding or "@" field stripping. The messages were sent ST NTSXX @ BBSCALLSIGN. Some traffic was sent ST section @ NTSXX. Eventually, most BBS sysops knew what BBS to send what NTSXX designators to, but this was a constant maintenance problem.

The callsigns of those states' NTS liaison BBS were published nationwide until it was determined that every state had an NTS BBS outlet. Delivery was still made for the most part on the local or section NTS nets by the packet/NTS liaison.

This occurred during the trough of the 1985 sunspot cycle and as new BBSs sprouted up with greater delivery coverage possibilities throughout the states, BBS NTS packet managers were recruited at various BBSs throughout the state to ensure that no NTS traffic was delayed, neglected, misrouted, misformatted, etc. These NTS packet managers would interface with the packet sysops and advise them and aid them in facilitating the transfer and delivery of NTS mesages. They would also recruit and stimulate more delievers for the area coverage of that BBS and report to the Section Net Packet Manager which cities could be delivered at their BBS.

WF6O was appointed the net manager of SCN packet and NI6A for NCN (section Nets for Northern and Southern Cal). WA6MBZ was originally Net manager for SCNSB/Packet. NTS/Packet interface was their responsibility in their sections, and they, in turn, performed the interface with the sysops and NTS net officials as well as recruiting and appointing BBS NTS managers.

NTS traffic would thus come into the state's HF GateWays and be forwarded to the NTSCA NTS holding BBS for redistribution. KD6SQ BBS and later AJ6F BBS were the NTSCA "Clearinghouse" BBS for Southern California and W6CUS served the same function in Northern California. Appropriate messages were assigned the appropriate "@ BBS" manually by the sysop or packet managers there, and sent on their way. Traffic with no packet delivery outlets were brought to the standard NTS CW or voice nets for delivery interface.

Northern California Early Packeting

As noted previously, KA6M and PPRS was a huge force in both Northern California and Nationally in the early days of packet technical development. However California fell quite behind the rest of the USA in regard to "linking" and other technical developments by mid-1984.

> Throughout 1981-1984 Northern California activity was centered around KA6M-1 BBS and KA6M-2, the worlds's first digipeater, located at 700'in Belmont above San Francisco Bay and the K6VCO-2 PPRS digipeater at 700' in the Oakland hills. KA6M-1, a Data General Computer with packet BBS software written by KA6M, was installed in 1981. This early Northern California packet activity was on 146.58 MHz

At first KA6M-1 served as a remote Data General Computer allowing both the execution of games and programs including access to a wealth of data for

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those who could venture into its inner depths. It kept up interest and increased activity in the early days and was the center of the Bay area packet activity until early 1985.

The KA6M-1 BBS carried UUCP ham conference mail, served as a local BBS message center, carried AMSAT news and the ARRL Gateway Magazine when it first came out in August 1984. But foremost KA6M-1 carried the infamous DRNET (Digital Radio Net Conference) where all the "Big" news of packet was being "made". Thanks to Bill Putney, WB6RFW at Tymnet and later N2DSY at EIS in New Jersey, the conferencing concerning packet development could be witnessed nightly by any packet user in the Bay Area who could access the KA6M-1 BBS. However, because of the inability to set DWAIT to high values at KA6M-1 when the lengthy DRNET files were downloaded, everyone had to "fly" to another frequency quickly or their packets would be gobbled up by the added "waitless" and relentless BBS loading. The "wizened" packet operators of that era "knew" the right time to pull the big switch and QRT for the night. DRNET, GateWay, AMSAT NEWS, etc was made available in Southern California packet community by KA6M-1 in the North and WB6YMH BBS throughoutin the South.

Although most activity was centered around the BBS's during these years, there were a few number of ragchewers and of course the hackers. Even though the first WestNet conference in July of 1983, at NK6K's QTH in Southern California, laid ambitious plans to link the State, it took WB6ASR and WB6RAL in January of 1985 to put up Northern California's first high level digipeater at 3600' on Crystal Peak, W6AMT, on January 26, 1985. Greg and George followed this feat a week later and 100 miles to the South with W6AMT-1 on Williams Hill at 2800 feet. Both were on a previously "dead" and unused packet frequency in Northern California, 145.01 MHz. But more about that that and THE GREAT PATH SOUTH soon.

1985 Packet Boom

Pre-1985 packeting was marked by research and development. In 1985 functional systems were made operational and the popularity of packet radio in the amateur community increased 20 fold. The PPRS formed its first frequency coordinating body in late 1984 with NI6A as chairman and N6IIU and WA6VZZ as working members. By January 1985, 145.01- 145.09 plus 223.56, 58, 60 and 441.5 MHz was granted by NARC (the repeater frequency coordinating body for Northern California) as a result of PPRS petition for packet operation. PPRS also formed its first board of directors and elected its first officers and collected its first dues 1985 and took a step forward from a discussion group to a operational organization. Dave Engle, KE6ZE, was the first president (KA6M declining all except a seat on the board of directors). Although Hank had been putting out a Newsletter since 1981, it had been at best sporadic. The burden had fallen mostly on KA6M and/or N6ECT. The new Board of Directors, however, started up the Newsletter again on a regular basis and has been regular ever since. Northern California packet was just beginning to coordinate activities and target long standing problems. PPRS became the first Network Coordinating Agent (NCA) for Northern California.

Cooperative ventures were beginning. Certain long term problems were being attacked from different angles. Coordination of high level digipeaters with the Northern Amateur Radio Council occurred in January. The first few coordinations applied for on behalf of PPRS were for W6AMT, W6AMT-1 and N6IIU.

The Golden Packet Award

It was at one of these early board meetings that the PPRS funded the GOLDEN PACKET AWARD, commemorating, much like the Golden Spike of railway fame, the event of the first trans-continental packet QSO on frequencies above 144 MHz and not using any satellite or commercial means. The official announcement went over DRNET as follwos:

From: H. S. Magnuski, KA6M
Date: March 30th, 1985

At the meeting of the Board of Directors of the Pacific Packet Radio Society on March 21st, 1985, the following resolution was passed: Whereas the Pacific Packet Radio Society was one of the first societies formed specifically to encourage the growth of computer networking via radio using all digital concepts and techniques, and whereas the San Francisco area was the site of the nation's first amateur digipeater, and whereas an even greater challenge faces the amateur radio community to establish a transcontinental link, the Pacific Packet Radio Society has decided to establish a unique award to encourage the completion of the first terrestrial transcontinental network link. This one-time award shall be known as the "Golden Packet" award, and the regulations relating to it are listed below:

1. A transcontinental link must be established, with each terminus located within 100 kilometers of either the Atlantic or Pacific Ocean.

2. The system must consist of fixed terrestrial digital store-and-forward radio links using VHF (greater than 144.1 MHz.), UHF or microwave frequencies. Use of HF, satellite, tropo, metscat or moonbounce channels is prohibited.

3. A valid two-way transmission and acknowledgement of previously unknown information (256 characters or more) must occur in real time (less than ten minutes).

4. This competition is open only to validly licensed North American amateurs, and no commercial links or services may be utilized in the path. Club stations are permitted.

5. Proof of the exchange must be adequately documented and submitted to the PPRS. Proof must include a list of the stations in the link, their locations, frequencies used, and a copy of the text exchanged.

6. The reward shall consist of a suitably engraved plaque with the names of all participating stations listed which shall be presented to the ARRL. Each participating station shall receive either a plaque or a certificate.

7. Final decision on the award is subject to review and approval by the Board of Directors of the Pacific Packet Radio Society.

Respectfully submitted,
H. S. Magnuski, KA6M
Pacific Packet Radio Society
P. O. Box 51562
Palo Alto, CA 94303

1985 and the Great Path South!

Most agree that the big turning point in packet nationally came in early 1984 when the TAPR TNC 1 kit was made available in quantity and proved that "off the shelf" technology was to be the deciding popularity tool for packet growth. Previously one had to be very adroit technically to put together and "hold" together a "Vancouver Board" TNC, or build your own TNC from scratch. 1985 proved to be a very decisive year for packet growth indeed, when quite a few commercial vendors offered TAPR kits and later assembled and tested TNCs for sale. Heathkit became licensed by TAPR to produce the first TNC 1 clone kit in early 1985. AEA was the first nationally available TNC 1 clone available wired and tested and came out shortly afterwards. We won't mention the GLB TNCs other than to say that there were "some" problems with them as a functional TNC during those days even though they made a readily available digipeater. But it was up to some dedicated mountain climbers and rf hardware hackers to put together a functional LINKED system in WestNet.

By a series of coincidences, on February 2, 1985, W6IXU at Arroyo Grande was working packet with WB6DAO above Santa Barbara via a 440 MHz full duplex voice repeater (N6ZF 443.875/448.875 on Broadcast Peak sponsored by SBCRA) in order to allow Mike to link with the newly installed k6tz-1 digipeater on 145.36 overlooking Santa Barbara Harbor West of Santa Barbara, that same fateful weekend trying to get an over-water link 145.36 to WA6OZJ-1 digipeater at 500 feet above the LA basin. That day, W6IXU in Arroyo Grande heard W6AMT-1 on Williams Hill (which was just put into service that same day) and was able to link into the Bay Area via W6AMT-1 and W6AMT. After realizing the historic potential of the moment, Mike then crossed the audio I/Os of his 145.01 MHz and 440 MHz radios and sent out the signals to WB6DAO in Santa Barbara via the 440 MHz voice repeater. Pete, WB6DAO, then crossed the audio at his station between his 440 MHz FM transceiver and his 145.36 MHz transceiver connecting them both to his TNC 1, thus forming the first North/South California packet link which was incredibly efficient given the technology involved and compared to today's throughput. Of course there were only a handful or two active packeteers on the circuit the first few weeks but it worked just great!

WB6DAO had a path to K6TZ-1 digipeater overlooking Santa Barbara Harbor which in turn had a good path into WA6OZJ-1 at Palos Verdes and W6SE in San Diego. Thus the first long dreamed about link from North of San Francisco via W6AMT to San Diego was finally established on that fateful February weekend of 1985.

Listening on 145.01 MHz that weekend of February 2, 1985 fulfilled a long time dream for many California packeteers. San Diego could talk to Petaluma; San Francisco to Los Angeles. The path was a bit sloppy but worked; via W6AMT, W6AMT-1, W6IXU, WB6DAO, K6TZ-1, W6SE (to San Diego) or WA6OZJ-1 (to LA).

(To be continued)

EOF

The Northern California and Nevada DXPSN

Bob Vallio, ~~W6RRG~~ R G-G

Our Editor has been beating me about the head and shoulders for some time now to provide him with an article on the DXPSN. This is written with the intent to provide a basic overview on what DXPSN is, and what it is not.

The full-service BBS stations provide a method for sending personal messages, bulletins, NTS traffic, and other traffic of a general nature to Amateur Radio stations anywhere in the world.

DXPSN is a DX spotting network, serving a specific geographic area, providing a means for those interested in DXing on all of the Amateur Bands to list "announcements" of stations they are hearing, and their operating frequency and mode, in real time.

The network is made up of Node stations, which are interconnected on a separate backbone frequency, each operating on a coordinated frequency to which users may connect.

In addition to the real time DX announcements, the DXPSN Node stations also support WWV report listing and archiving, talk mode and conference mode communication between connected stations, and a mail and bulletin system which is not connected to the full service BBS network; as well as a host of other features which are of interest to DXers. Please note that any messages or bulletins posted on a DXPSN Node will NOT leave the DXPSN network.

If you are interested in DXing, and want to see what the DXPSN operation is like, below is a list of Node stations, their frequencies, and general geographic service areas. Each Node is independently operated, but there is an organization of SYSOPs which maintains the backbone connections and system continuity, and a User's Group which marshalls support and makes operating manuals available to the user community. When you first connect, type the command "show/commands" for a listing of system features.

So here is your chance to see another side of the convenience of Packet operation. Monitor one of the frequencies and see what is going on. You may even even get the DX bug and want to join in!!

73 Bob, W6RRG

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Northern California DXPSN Nodes

Node	Frequency	Service Area
K6OZL	144.950	Hanford
N6ST	146.595	Los Gatos
K6LLK	144.950	Mountain View
K6AYA	146.580	Oakdale
K6GXO	145.660	Palmdale
W6OAT	145.770	Redwood City
KI3V	144.950	Reno
W6GO	144.950	Rio Linda
W6OTC	~~146.580~~ 145.67	San Francisco
WB2CHO	144.950	Santa Rosa
KJ6NN	1299.900	Milpitas
AH0U	~~145.770~~ 146.58	Pittsburg

Northern California Packet Band Plan

50 MHz

51.12	SOCAL backbone
51.14	Experimental
51.16	Keyboard to Keyboard
51.18	Experimental

144 MHz

144.91	Keyboard to Keyboard
144.93	LAN[1]
144.95	DX Cluster
144.97	LAN
144.99	LAN
145.01	APRS
145.03	Keyboard to Keyboard
145.05	Keyboard to Keyboard
145.07	LAN
145.09	LAN
145.61	9600 bps
145.63	LAN
145.65	TCP/IP 9600 bps
145.67	DX Cluster
145.69	LAN
145.71	9600 bps
145.73	LAN
145.75	TCP/IP
145.77	DX Cluster
145.79	LAN
146.58	DX Cluster

[1]Some TCP/IP in Sacramento grandfathered

220 MHz

223.54	Node uplink (East Bay)
223.56	Node uplink (West Bay)
223.58	Node uplink ("Other")[1]
223.60	Node uplink (Sacramento Valley)
223.62	Node uplink (South Bay)
223.64	TCP/IP
223.66	Keyboard to Keyboard
223.68	LAN
223.70	Node uplink (Monterey Bay/North Coast)
223.72	Node uplink (North Bay)
223.74	DX Backbone

[1]TCP/IP interlink (Sacramento) Not to interfere with node uplink.

440 MHz

441.50	All

Packet channels below 440MHz are available, but must be coordinated on a case-by-case basis as auxiliary allocations in conjunction with NARCC. Contact WD6CMU 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 - BBS links (Contra Costa County only)

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

1296 MHz

1248.500	1 Mhz wide - Full duplex with 1299.500 Experimental
1249.000 to 1249.450	Unchannelized - Experimental
1249.500	100 Khz wide - Experimental
1249.600	100 Khz wide - Experimental
1249.700	100 Khz wide - Full duplex with 1299.700 Experimental
1249.800	100 Khz wide - Full duplex with 1299.800 Experimental
1249.870	20 Khz wide - Experimental
1249.890	20 Khz wide - Experimental
1249.910	20 Khz wide - Full duplex with 1299.910 Experimental
1249.930	20 Khz wide - Full duplex with 1299.930 Experimental
1249.950	20 Khz wide - Full duplex with 1299.950 Experimental
1249.970	20 Khz wide - Full duplex with 1299.970 Experimental
1249.990	20 Khz wide - Full duplex with 1299.990 Experimental
1250.500	1 Mhz wide - Experimental
1251.500	1 Mhz wide - Experimental
1297.000 to 1298.000	Unchannelized - Experimental
1298.500	1 Mhz wide - Full duplex with 1299.500
1299.000 to 1299.450	Unchannelized - Experimental
1299.500	100 Khz wide - Experimental
1299.600	100 Khz wide - Experimental
1299.700	100 Khz wide - Full duplex with 1249.700 Experimental
1299.800	100 Khz wide - Full duplex with 1249.800 Experimental
1299.870	20 Khz wide - Experimental
1299.890	20 Khz wide - DX Packet Cluster users
1299.910	20 Khz wide - Full duplex with 1249.910 Experimental
1299.930	20 Khz wide - Full duplex with 1249.930 Experimental
1299.950	20 Khz wide - Full duplex with 1249.950 Experimental
1299.970	20 Khz wide - Full duplex with 1249.970 Experimental
1299.990	20 Khz wide - Full duplex with 1249.990 Experimental

Northern California Packet Band Plan

Continued from previous page

Definitions

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

Backbone, Uplink, Interlink — No uncoordinated stations. These channels are for specific purposes as defined by the NCPA and affiliated groups. This is where the various BBS, nodes, and clusters interlink and are very high usage channels. Please use the normal 2 meter entry points of the network you want to access rather than these channels.

Keyboard to Keyboard — Anything but full service BBS, TCP/IP, or DX Cluster. Primarily chat channels. These are also the primary emergency channels. Some existing BBS systems (eg. WA6RDH) were grandfathered.

A gray area is "Personal BBS." A PBBS is one with a small number of users (rule-of-thumb: five or less). A PBBS should not be attracting general users thru beacons, etc. Bulletins should be confined to local information and not duplicate the general bulletins send to the community. That's the job of a full service BBS and we have lots of them in Northern California to use.

LAN — Local Area Network. Anything except TCP/IP and DX Cluster is tolerated. Please avoid placing high level digipeaters or nodes on these channels since they are "local." A low-level node that links into a backbone on another frequency is the preferred implementation.

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

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

9600 Bps — Stations using 9600 Bps with direct FSK (G3RUH, TAPR, etc.) modems.

Procedure for changes

Users should contact either the frequency coordinator or the NCPA board. The frequency coordinator will then present the requests to the board at the next meeting along with suggested assignments. The NCPA board elected by you, the packet user, makes all assignments!

Electronic mail is preferred.

Note: NCPA does not coordinate individual stations, nodes, etc. The only station coordination is done by KA6EYH for bulletin board systems.

Where to Find a BBS

N0ARY-1	Sunnyvale	144.93, 433.37
KE6BX	Hollister	144.93
KJ6FY-1	Benicia	144.93, 441.50
N6VZT	Brentwood	144.93
KD6CVR	Danville	144.97
WD6CMU	Richmond	144.97
N6EEG	Berkeley	144.97
WA6EWV-1	S. Lake Tahoe	144.97
KD6JZZ	Sonora	144.97
K6LY	Monterey	144.97
N6LDL	Los Gatos	144.97, 145.71[1]
AA4RE-1	Gilroy	144.99
KA6FUB	Martinez	144.99, 441.50
KD6RKP-2	Brookdale	144.99
KE6LW-1	Yuba City	145.99, 441.50
W6PW-3	San Francisco	144.99
W6SF	Stockton	144.99
WA6RDH	Dixon	145.01, 441.50
KG6EE	Santa Cruz	145.07
KI6EH	Santa Cruz	145.07
N6IIU-1	Palo Alto	145.07, 223.68
KM6PX-1	Citrus Heights	145.07, 441.50
KK6WD	Redding	145.09
N6IYA-2	Felton	145.09, 441.50
KD6EUK	Felton	145.09, 441.50
KB6AML	Concord	145.09, 441.50
KC6PJW	Rhonert Park	145.09
WA6NWE-1	North Highlands	145.09, 441.50, 144.93[2]
WA6YHJ-1	Livermore	145.09
KA6EYH-2	Daly City	145.69, 441.50
WA6HAM	Pittsburg	145.69
KD6KWM	Santa Rosa	145.73, 441.50
W8GEC	Boulder Creek	145.73
KA6JLT-2	Menlo Park	145.73, 145.71[1]
AA6QR	Orinda	145.73
KB6MER	San Jose	145.73
K3MC	Sunnyvale	145.75[2]
W6CUS-1	Richmond	145.79
N6MPW	Ben Lomond	144.79
N6QMY-1	Fremont	145.79, 441.50
KD6XZ-1	Sacramento	145.79, 441.50
K7WWA	Willits	145.79
KK6H-1	Point Reyes Stn.	145.79
W2AIR	Two Rock	441.50

[1]9600 baud port

[2]TCP/IP port

The President's Corner

Bob Arasmith N0ARY
President, NCPA

Ah, another Christmas behind us. They sure seem to be coming quicker these days and have lost a little of the magic that I remember. But having kids has definitely shown me that the magic is indeed still there.

I have been running up against an attitude in packet that has me a bit worried. As some of you are aware I am one of the proponents of using the 4 letter continent abbreviations. Personally I respect everyone's right to develop their own opinions on these issues and voice them but I received some packet mail from a group of hams that really made me think.

I bundle them into basically two groups, the "it isn't bothering me, so why should I change?" and "the only reason these guys want NOAM is to be compatible with internet". Needless to say both of these statements show a tendency to stagnate rather than grow. I would imagine there was a group of AM folks using this same argument when FM was introduced, and a group of spark gap people when AM came along. We are all familiar with the "if it isn't broke, don't fix it" phrase. Heck, I have used it on numerous occasions.

But we have to keep our eyes open. We are not the only game in town anymore and we are quickly falling far behind. We should not be walking along blindly without watching what the rest of the world is doing. Internet has caught on like wildfire. Where it used to be available only to large companies and universities, now you find internet connections in the homes of Joe average. To me it seems obvious that finding a way to merge these two networks can only benefit us and get more people connected. On the horizon, and currently in some of your backyards, we have fiber/coax phone infrastructures being built, cable tv is expanding into bi-directional connectivity. All the big players are getting involved, Microsoft, Lockheed, SGI, the list is endless. And where are we? Last time I checked, 1200 baud, and actively fighting any change.

So now that I have painted this bleak picture what is it we should be doing? Remember our roots. We are experimenters by nature. We are communicators. See what you can do to further the hobby. Get the instructions for building a 9600 baud modem for your 1200 baud tnc. Dig out that old rig and check the schematics, see if it can be used for higher baud rates. If your forte isn't tinkering at the component level get a group buy together at your local club and purchase some 9600 baud tncs. We have to wakeup and move forward. We have some excellent examples to follow down this path. Dewayne Hendricks (WA8DZP), one of our past NCPA board members, has started a company using what started as ham technology and is now doing high-speed, reliable connectivity over the air at over 128K baud.

I have listened to Mike Cheponis (K3MC) talking about his 56Kb modem at a number of clubmeetings. He has been more than willing to discuss what it takes to build one. At a past NCPA meeting KC6AND came and discussed a 2Mbit project. There are a number of clubs that focus on experimenting and every month it is a show-and-tell of what's new, laser communication, high speed digital, etc. We need this type of experimentation to move us back into the running. I guess what I am trying to say is don't be willing to just live in the past. Don't fight change, it is almost always for the better. Never be the one saying "If it isn't broke...." instead say "how can we make this better?"

73..

Bob Arasmith, N0ARY

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How APRS Came About

Continued from page 3

Bruninga, Proceedings, IEEE COMPCON 84 16 Sept 84, (Published the USA packet map, and amateur HF packet standards) [7] CONNECTIONLESS EMERGENCY TRAFFIC SYSTEM, Bruninga, Packet RadiMagazine, pg 4-5, July 86. (details the design of the connectionless position and status reporting system)

[8] AN UPDATE ON THE CONNECTIONLESS EMERGENCY TRAFFIC SYSTEM, Bruninga, Packet Radio Magazine, Aug 86. (more of the same)

[9] CONNECTIONLESS PROTOCOL for the NDMS, Bruninga, p 19, Packet Radio Magazine, Nov 86. (using the connectionless protocol for emergency comms)

[10] PACKET RADIO AT THE WRECK OF THE AMTRACK COLONIAL, Bruninga, P 13 Packet Radio Magazine Jan 87. (using portable packet for disaster comms)

[11] LANS and WANS, Bruninga, 7th ARRL Computer Networking Conference, 1 Oct 88 (First DC/BALTIMORE area packet maps with APRS symbols)

12] A WORLDWIDE PACKET RADIO NETWORK, Bruninga, Signal Magazine, June 88, (shows HF map of 10.149 MHz activity.

[13] PACKETRADIO IM NOTFUNKEINSATZ BEI EINEM ZUNGUNGLUCK, RTTY magazine 18 Jan 87. (translation of article on APRS packet at the AMTRACK train wreck)

CURRENT:

[14] AUTOMATIC PACKET LOCATION SYSTEM (APLS), Bruninga, ARRL Gateway/QEX, Feb 1991. (early specification for position and status reporting formats)

[15] GROUND STATION TRACKING VIA PACKET RADIO, Bruninga, AMSAT Journal, Pg 1 May/June 93[16] TRACKIT RADIO, Stan Horzepa, p 92, QST, July 93

[17] UPFRONT IN QST, p 11, QST, August 93. (excellent pictures)

[18] A DESCRIPTION OF APRS by WB4APR, AND MORE!, PACKET USERS NOTEBOOK, Buck Rogers, CQ Magazine, Dec 93

[19] INTERFACING GPS/LORAN DEVICES TO PACKET RADIO, Bruninga, pg 9-14, QEX, Feb 94

[20] HOMING IN, Radio Direction Finding, by Joe Moell, page 56-59, October 94 issue of 73 Magazine.

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NCPA Board Meeting Minutes

Jeri Bissell, N7YYG
NCPA Secretary

August 7, 1994

The NCPA Board of Directors meeting took place at the Contra Costa Fire College in Concord on Sunday August 7, 1994. Present at this meeting were the following board members:

N0ARY, WA6HAM, WD6CMU, N7YYG

Also in attendance were:

K0ZQ, AB6YM, K6RAU, KB6AML, KD6DZZ, KD6MXL, W6RGG, WA6AEO, WA6GOL, WA6ZTY, WB6YRU

1. The meeting was called to order by N0ARY at 10:13. Introductions were made about mid-meeting.

2. INTERFERENCE. Bob, N0ARY,said that Roy, KA6EYH called to his attention a problem with interference on 223.56, a West Bay LAN Frequency. This interference took the form of beacons, every 5 to 10 seconds, cascading thru 6 digi nodes. This interference has not been noted in the last 3 to 4 weeks and is assumed to have ceased.

3. DOWNLINK. Richard, WA5HQJ, is working on the newsletter to be published prior to PACIFICON. He is waiting for articles to be submitted that had been promised at the last Board Meeting. Apparently there has been difficulty getting messages to WA5HQJ at his BBS, KB6AML, due to an occasional bottleneck at N6QMY. It was suggested by N0ARY that Richard be contacted via mail or directly via keyboard-keyboard packet.

4. DIGITAL SPECTRA. Fred, K6RAU, as a member of CENCA (CENtral CAlifornia) indicated that they are continuing to seek more frequencies on 2 meters for digital use. Bob, N6FRI, as a member of NARC, indicated that they do not "sanction" frequencies per se, but rather respond to identified groups who demonstrate a need to the amateur community. Specific frequencies to be monitored for activities were chosen. WD6CMU, WA6AEO, WB6YRU AND N0ARY will monitor those frequencies and will report findings to WD6CMU by the end of the month.

5. RADIOS. Bob, W6RGG, stated that narrow band 220 data communication radios at a 9600 baud rate are becoming more and more reasonable in the marketplace. It is feasible that they are modifiable to HAM bands.

6. PACIFICON. We will have the last 3 seminars on Saturday: An Introduction to PACKET, An Introduction to TCPIP, and a General Q & A Session. We plan to distribute membership forms at the door at the end of the classes. We will have a table at PACIFICON, #13, at the same site as last year. Bruce, AB6YM, is our PACIFICON co-ordinator. He will have sign-ups for staffing the table. It is expected that we will have at least 2 people man the table at all times. We will set up a PACKET station with a PC for demonstration purposes, accept membership applications, and sell copies of "Introduction to PACKET Radio" and "The TCP\IP Primer". Bob, N0ARY, will order additional copies so that

we have 250 of each on hand.

7. TREASURER'S REPORT. Steve, WA6HAM, reported that we have a balance of $2599.40 in the NCPA account.

The meeting was adjourned at 11:55.

November 13, 1994

The NCPA Board of Directors meeting took place at the HAL Computer Building in Campbell on Sunday November 13th at 10:00am. Present were the following board members:

N0ARY, WA5HQJ, AB6YM, KA6EYH, W6RGG, WB6YRU, WD6CMU, and N7YYG

Also in attendance were:

K6LFB, KA6FYH, and WA6ZTY

1. The meeting was called to order by N0ARY at 10:17.

2. PACIFICON. Bruce, AB6YM, reported that we made $1623.00 at the PACIFICON Convention in October. The overhead for the booth was $100.00. The table was in a lower traffic area than the previous year, and we were unable to set up a PACKET demo. Eighty "Introduction to Packet" were sold as well as 65 "Introduction to TCPIP". We are considering having a table set up at the Foothill and Los Altos Swap Meets in January.

3. NEW SUB BAND. We have a new sub-band 145.61 - .69.

145.61 for high speed experimental.

145.63 for BBS LAN

145.65 for High Speed TCPIP

145.67 for DX Cluster

145.69 for BBS LAN (no high level)

Frank, K6LFB, the District Emergency Coordinator for San Francisco brought up the question of how frequencies are allocated for use. He was encouraged to bring this up with NARCC.

4. GENERAL MEETING. The next General Meeting of the NCPA will be held in April, 1995. We will be looking for a place to hold the meeting, Pacific Bell in San Ramon was suggested. We would like to have a speaker, perhaps on TCPIP and High Speed Packet. Send suggestions for a speaker to Bob Arasmith, N0ARY.

5. ATV. Bruce Perens, AB6YM, attended the NARCC Frequency Coordinators General Meeting. Frequencies for a second ATV channel in the Fresno area are being sought. Eric Williams, WD6CMU, our Frequency Coordinator, will contact them regarding potential interference problems with forwarding links to the coast.

6. 2.4 GIGAHERTZ. Bruce Perens, AB6YM, said that the Dept. of Commerce is going to be taking this band from the Amateur Community in order to sell it to private industry. Any comments are due to the FCC by Dec. 17. Bruce indicated that he will send a message from our organization indicating that this band should be reserved for the amateur community and that PACKET would be ideal in this frequency when we have the technical capability to use it.

7. DOWNLINK. The deadline for articles for the next "Downlink" is December 15. They should be mailed or uploaded to WA5HQJ.

8. MEMBERSHIP. Jeri, N7YYG, indicated that she will be sending out renewal postcards to all delinquent NCPA members in order to update the membership list.

9. BBS FORWARDING. N0ARY reported that at the NCXPN meeting in October it was decided that forwarding will be discontinued to gateways and BBS's that use 2 meters as forwarding links. The cut off date will be December 31.

10. The next Board Meeting will be Sunday Feb. 12, 1995 at 10:00 at the General Parametrics Building in Berkeley.

The meeting was adjourned at 12:20.

EOF

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N0ARY @ N0ARY

Vice-President:
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KA6EYH @ KA6EYH

Secretary:
Jerri Bissell, N7YYG
N7YYG @ WA6RDH

Treasurer:
Steve Overacker, WA6HAM
WA6HAM @ WA6HAM

Newsletter Editor:
Richard Shappee, WA5HQJ

Frequency Coordinator:
Eric Williams, WD6CMU
WD6CMU @ WD6CMU

What is NCPA?

NCPA, the Northern California Packet Association, is an organization formed to foster the Digital Communications modes of Amateur Radio. So far, we have defined our goals as:

- **Education**
- **Coordination**

Education means making information available about various Digital modes, and this newsletter is but one part of that education process.

Coordination activities include frequency coordination (NCPA is recognized by NARCC as the official packet radio frequency coordinator) as well as coordinating people and their various uses of packet radio, be they DX Cluster, BBS, TCP/IP, keyboard-to-keyboard, NET/ROM, Traffic/NTS, Emergency uses of packet, or even experimenting with new frontiers of various digital modes.

We in NCPA believe that the next revolution in Ham Radio will come about in Digital Communications Technology, and in the beneficial coordination among all users of ham Digital Communications Technologies.

We invite you to join NCPA! Become part of the most dynamic group of packet folks in Northern California!

NCPA *Downlink*

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First Class Mail