PACKET STATUS REGISTER

Tucson Amateur Packet Radio Corporation
A Non-Profit Research and Development Corporation

In This Issue:

President's Corner

There are a number of changes happening at TAPR this summer. One of them is already obvious to you as you read these words. The Packet Status Register (PSR) is changing to an electronic format effective with this, the Spring / Summer 2001 issue.

In the last issue, we asked you to tell us what you thought about moving the PSR from a paper to an electronic publication. Over 50 members responded, and the feeling was overwhelmingly in support of an electronic PSR. The Board voted on the matter, and decided to publish the Packet Status Register via the TAPR web site (http://www.tapr.org) on a quarterly basis. We will continue to do at least two paper mailings per year, one of which will include ballot and other materials for the Director elections.

The move to an electronic PSR will allow us to bring you a more current, more colorful, and hopefully more interesting journal of our activities. In conjunction with the transition, Steve Stroh, N8GNJ, is taking over as PSR editor. Bob Hansen, N2GDE, served in the demanding and thankless task of PSR editor for nearly a decade, and has decided to take a well-earned retirement. On behalf of TAPR, I'd like to thank Bob for the countless hours he's spent slaving over his desktop publishing software to create the PSR for all these years.

The current issue of the Packet Status Register will be available at www.tapr.org/PSR/Summer-2001.pdf. It will be in Adobe Acrobat [version 5 – Ed.] format; if you don't have the reader software, we will have a link to take you to Adobe's site.

Tucson Amateur Packet Radio Corporation
Packet Status Register Newsletter

TAPR Officers:

President:	John Ackermann N8UR
Vice President	Steve Bible N7HPR
Secretary	Guy Story KC5GOI
Treasurer	Jim Neely WA5LHS

TAPR Board of Directors:

Board Member	Term Expires	email address
John Ackermann N8UR	2001	n8ur@tapr.org
Byon Garrabrant N6BG	2001	n6bg@tapr.org
Doug McKinney KC3RL	2001	kc3rl@tapr.org
Steve Bible N7HPR	2002	n7hpr@tapr.org
Bob Hansen N2GDE	2002	n2gde@tapr.org
Steve Dimse K4HG	2002	k4hg@tapr.org
Steve Stroh N8GNJ	2003	n8gnj@tapr.org
John Koster W9DDD	2003	w9ddd@tapr.org
Mel Whitten K0PFX	2003	k0pfx@tapr.org

Tucson Amateur Packet Radio is a non-for-profit scientific research and development corporation [Section 501(c)(3) of the US tax code]. Contributions are deductible to the extent allowed by US tax laws. Tucson Amateur Packet Radio is chartered in the State of Arizona for the purpose of designing and developing new systems for digital radio communication in the Amateur Radio Service, and for disseminating information required, during, and obtained from such research.

Packet Status Register Editor:

Steve Stroh N8GNJ

n8gnj@tapr.org   425-481-0600
P.O. Box 2406, Woodinville, WA 98072 USA

Submission Guidelines for Packet Status Register:

TAPR is always interested in receiving information and articles for publication. If you have an idea for an article you would like to see, or you, or someone you know, is doing something that would interest digital communications, please contact the editor so that your work can be shared with the Amateur Radio community. If you feel uncomfortable or otherwise unable to write an article yourself, please contact the editor for assistance.

Preferred format for articles is plain ASCII text (Microsoft Word is acceptable, please save the document as Rich Text Format - .RTF). Preferred graphic formats are TIFF (diagrams, black and white photographs), or JPEG (color photographs). Please submit graphics at a minimum of 300 DPI. All submissions on diskette should be formatted for MS-DOS.

Production / Distribution:

Packet Status Register is composed in Microsoft Word for Windows and exported as Adobe Acrobat version 5. Packet Status Register is distributed electronically at www.tapr.org/PSR

President's Corner (cont. from Page 1)

Many of the survey respondents said they'd like to either receive the PSR by email, or receive a notice by email when a new issue is available. After a lot of discussion, the Board determined that it wasn't practical to use email as the PSR distribution channel. We did agree, though, that an email notice when a new issue was available, with a summary of its contents, was a good idea. TAPR already has a mailing list designed for announcements – tapr-bb@lists.tapr.org – and we'll use that list as the vehicle for these announcements. You can subscribe to the tapr-bb list by going to http://www.tapr.org/cgi-bin/lyris.pl?enter=tapr-bb&text_mode=0 (you can also get to there by starting at the TAPR home page and following the links from the "TAPR Lists" link at the lower left corner). The only messages posted to this list will be TAPR announcements, and it is closed so that spammers will not be able to get at it.

Please let us know what you think of the new, improved Packet Status Register. You can send your comments - and even better, your stories - to psr@tapr.org.

The other big news is that as of August 6, the TAPR office will be moving a few miles. Dorothy Jones, KA5DWR, has decided to retire as Office Manager, and we're very happy that Laura Koster (XYL of Board Member John Koster W9DDD) will be taking over both the job, and the physical office. Elsewhere in this issue you'll find our new contact information.

I don't know where to begin in describing all the Dorothy has done for TAPR. Amidst all the chaos that a bunch of organizationally challenged volunteers like us can create, she stood calmly picking up the pieces and making sure the place ran smoothly. She handled all the logistics for Hamvention, and put in long hours at both Hamvention and the DCC every year. She's just a truly nice person who did a great job, and we're going to miss her.

The past year has seen a lot of change within TAPR -- several new Board members and officers, a new vision for the PSR, and last but certainly not least, the transition of the office into Laura Koster's capable hands.

Change is never easy, but I think we've made decisions that will serve TAPR well in the long run.

Get Ready for the Digital Communications Conference!

If you haven't already, it's time to finalize your plans to attend the 20th ARRL/TAPR Digital Communications Conference which will be held from September 21 - 23 in Cincinnati, Ohio (actually, near the Cincinnati/Northern Kentucky International Airport in Covington, KY). This year's program promises to be a great one, with a full day of APRS activities on Friday, and great presentations on Saturday. A real treat this year will be Sunday's technical seminar, where Dave Newkirk, W9VES, will present a hands-on tutorial on using the Serenade RF design software from Ansoft. Dave works for Ansoft and wrote a recent QST article that whet many appetites for this product. I've been playing with Serenade, and it's really fantastic – the free student version will do just about any RF design task that a ham might want to try. There are more details on the DCC elsewhere in this issue.

DSP-10 Kits Shipping!

By the time you read this, the first DSP-10 Software Defined Radio kits should be just about on their way to the folks who are anxiously waiting for them. I view this as a breakthrough product, not just for TAPR, but for ham radio. SDRs are the way of the future, and the DSP-10 offers a way to get involved that not only teaches, but works really well -- a pair of these radios were used to make an Earth-Moon-Earth QSO on 2m using only 150 watts and a single yagi at each end. I'm not a weak-signal expert myself, but my friends who are say "WOW" when they hear that. This is a kit you should check out.

73 for now,
John N8UR

Find TAPR on the World Wide Web at:

www.tapr.org

Version 7.6.0 of WXN Released
John Bennett, N4XI

Version 7.6.0.0 of WXN, A Weather Server For Amateur Radio, has been released. A basic summary of improvements and/or bug fixes:

- All weather data now in CSV (comma-delimited) format
- Data alarm with configurable trip points
- Added weather station support for Oregon Scientific WM918, Radio Shack WX200 and TAPR T-238
- A major memory leak fixed in the text-based window sub-system

For more details and to download, point your browser at:

members.sigecom.net/jabennett/wxn

Please note that my ISP has been having major problems with their FTP/HTTP server, It has been down now for the last 72 hours. <soap_box on> It is rumored they are running NT. While I am fond of NT/2000 as a workstation and solution for small network/business environments, I have learned that it doesn't scale very well when you start getting into a large number of users. More and more often I hear of IT departments replacing NT with Linux and all the problems go away in these types of situations <soap_box off>.

You can also download the code from:
www.tapr.org

I would like to express my thanks to many of the people that helped (maybe should read "...put up with me") during this rather long beta period for the current release: Bob Effland AI9H, Gary Williams N9UT, Paul Goss KB9TUO, Mary Miller KA9DMG, Tammy Miller KB9TJU, Budd Mann N9NAU, Mark Parker N9NYF, Walt Gleim, Jerry Kutche N9LYA, Ed Franklin N9LAX, and David Tucek (NWS). I want to especially thank Walt and Jerry for their valuable feedback on the program and for keeping after me when things didn't work the way they should. My apologies to anyone I left out.

Feel free to contact me with any questions or concerns you might have. Reply to this message or use one of the links at the site.

73,
John Bennett, N4XI
Evansville, IN
members.sigecom.net/jabennett/wxn
n4xi@arrl.net

First Quarter 2001 Board of Director Notes
Guy Story KC5GOI, Secretary

- ~January 12,2001 Nomination made to appoint Steve Stroh to the TAPR BOD. Seconded by Doug McKinney

John Ackermann	For	Doug McKinney	For
Steve Bible	For	Mel Whitten	For
Steve Dimse			
Bob Hansen	For		
John Koster	For		

- January 15, 2001 John Ackermann made an inquiry to the possibility of offering a life time membership as an option for membership in TAPR. A formal vote has not been initiated. John made the suggestion that Steve D (membership) and Doug (marketing) look into this possibility and provide a recommendation.

John Ackermann		Doug McKinney
Steve Bible		Steve Stroh
Steve Dimse	Opposed	Mel Whitten
Bob Hansen		
John Koster		

- January 28, 2001: Byon Garrabrant was nominated by John Ackermann for the vacant position on the TAPR BOD. Byon responded to John's invitation with concerns that there may be a conflict of interest (COI). The board discussed the possible COI and come to the conclusion that the COI is not an issue. Byon accepted the nomination on February 01, 2001. Steve Dimse seconded the motion. Vote currently stands at:

John Ackermann	For	Doug McKinney	For
Steve Bible	For	Steve Stroh	Unknown
Steve Dimse	For	Mel Whitten	Unknown
Bob Hansen	Unknown		
John Koster	For		

- February 6, 2001: Doug McKinney posted a first draft of the TAPR Project Policy for review by the board.

- February 7, 2001: John Ackerman made the following proposal:

1. TAPR set up an "aprstcp" group (or something similar on tapr.org for the use of this effort. We ask one of the current leaders to be the moderator. The WG members will *not* be members of this group unless they want to be, and it will operate independently of the WG.

2. The APRS WG states that we will consider any output document from the "aprstcp" group as a proposed protocol, but will require a volunteer to serve as editor / administrator for the review process.

3. I have a potential volunteer to be the editor/administrator.

- February 26, 2001: Motion made by John Ackermann to accept Bob Hansen's Q4 2000 minutes. Seconded by John Koster.

John Ackermann	For	John Koster	For
Steve Bible		Doug McKinney	
Steve Dimse	For	Steve Stroh	For
Byon Garrabrant	Abstain	Mel Whitten	
Bob Hansen	For		

- March 07, 2001: End of year financial status was submitted to the BOD for review and approval by Jim Neely, Treasurer. Motion was made by Steve Stroh to accept. Seconded by Steve D.

John Ackermann	Accepted	Bob Hansen	
Steve Bible	Accepted	John Koster	Accepted
Steve Dimse	Accepted	Doug McKinney	
Byon Garrabrant	Accepted	Steve Stroh	Accepted
		Mel Whitten	

- March 28, 2001: Steve Bible made the motion for the following action, motion was seconded by John Koster. To help achieve this, I'd like to move that the PSR editor receive a stipend of $250 per issue published on schedule (as determined by the Board). If the issue is mailed more than 15 days after the deadline, the stipend would be reduced to $125, and if the issue is more than 30 days late, the stipend for that issue would be forfeited.

John Ackermann	For	Bob Hansen	For
Steve Bible	For	John Koster	For
Steve Dimse	For	Doug McKinney	For
Byon Garrabrant	Accepted	Steve Stroh	Abstained
		Mel Whitten	For

- March 30, 2001: Jim McNeely submitted the January financial reports. Steve D. made a motion to accept the financial reports.

John Ackermann	For	John Koster	For
Steve Bible	For	Doug McKinney	For
Steve Dimse	For	Steve Stroh	For
Byon Garrabrant	For	Mel Whitten	For
Bob Hansen			

- March 31, 2001: Jim McNeely submitted the February financial reports. John K. made a motion to accept the financial reports.

John Ackermann	For	John Koster	For
Steve Bible	For	Doug McKinney	
Steve Dimse	For	Steve Stroh	For
Byon Garrabrant	For	Mel Whitten	
Bob Hansen			

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APRS News and Commentary:
2001: APRS Dayton Odyssey
Stan Horzepa, WA1LOU
email wa1lou@tapr.org

"APRS News and Commentary" is a new Packet Status Register *column that discusses APRS (Automatic Position Reporting System). In each installment, I will describe the latest happenings in this popular packet radio mode. If you have any APRS news, please send it to me and I will consider it for publication. Anyway, enough with the preliminaries and on with the show!*

A Piece of Cake

In early April, I began making my plans for the Dayton Hamvention. I usually go with a goal in mind. Some years, my goal is to buy some new whiz-bang radio gear at the lowest price possible. Other years, my goal is to drive to Dayton in record time (the current land-speed record for the 712-mile Wolcott-to-Dayton trek is 10.25 hours, which includes pit stops. I was the navigator for that record-breaking road trip, but I have been unsuccessful trying to break that record from behind the wheel.) This year, I decided that my goal was to get APRS its own forum at the Hamvention.

In years past, the APRS nation has decried the lack of an APRS forum at the Hamvention. Yes, Steve Dimse, K4HG, usually moderates an APRS sub-forum that is shoehorned into a 45-minute slot during the TAPR forum, but most folks felt that was inadequate (quantity, not quality). My plan was simple. Steve agreed to give me 2.5 minutes at the beginning of his forum to ask everyone in attendance to sign a petition that asked that the Hamvention folks to seriously consider a full-fledged APRS forum for

the 2002 Hamvention. With a few hundred signatures in hand, I planned to storm the Bastille and demand a forum for APRS.

I announced my intentions on the APRSSIG. Mac McMillian, W8XF, was reading the mail. He is on a Hamvention committee and passed along my intentions to Jim Ebner, N8JE, chairman of the Hamvention forum committee. A few days later, N8JE emailed me and said he had a 90-minute slot available in the Sunday 2001 forum schedule and asked me if I would like to fill it.

My original plan was to put together a forum that was 12 months away not one that was two weeks away, but I figured that I had better grab the opportunity and see if I could fill the 90-minutes slot. Nearly everyone I asked to speak at the forum was willing and I filled the 90-minute slot to -capacity. It was a piece of cake!

Web Page

The other goal I had for Dayton this year was to put up a Web page that delineated all in one place, all that was going on APRS-wise at this year's Hamvention. The page included the schedule of all the talks or forums that were APRS-related, the location of any APRS-related companies, groups, and organizations camped out in the Hara Arena or in the Hamvention flea market. It also listed information regarding any other APRS-related activities scheduled during the Hamvention weekend, information regarding the Dayton-area APRS network, and finally a roll call (with mugshots) of the members of the APRS nation who were planning to attend the Hamvention, Nearly, 150 APRS folks were entered into the list (see for yourself at www.tapr.org/~wa1lou/2001/2001.html), but a lot more actually showed up as you will read further along in this article.

Making Tracks

I began driving to Dayton at 4:45 AM on Thursday, May 17. Naturally, my car was APRS equipped: a Kenwood TH-D7A, 35-watt amplifier, Garmin GPS-II+, quarter-wave magnetic-mount antenna on the roof, and a Palm III PDA running the latest version of *pocketAPRS*. We made tracks on I-84 throughout Connecticut, New York, and Pennsylvania and

on I-81 through the Scranton-Wilkes-Barre, Pennsylvania area.

However, not long after I made the right-hand turn onto I-80 for the bulk of my trek through the Keystone State, the bottom dropped out of APRS. Except for a handful of digipeats in the State College area, I encountered no APRS activity on the 276-mile, 4-hour I-80-leg of my journey. A few times, I checked all the equipment interconnections to make sure everything was working, but to no avail… nothing but dead air. Maybe my path of WIDE3-3 was not compatible with the local network. Behind the wheel sans passenger, I did not have the opportunity to experiment with paths, so I suffered through the silence of the LANs.

As I approached Akron, Ohio, from the east on I-76, I began to encounter APRS again and APRS coverage was very good the rest of the way (I-76, I-71, I-270, I-70, and I-75). In Dayton, I was not surprised to find a cacophony of APRS activity!

(By the way, my return trip on Sunday was the same.)

Kids, Don't Do This At Home!

The batteries in my Palm III gave up the ghost west of Columbus on I-70, so I swapped the two AAA batteries with a fresh set while traveling down the interstate at about 72 MPH. All was fine until the next day when I powered up the Palm. I had to initialize it and after I did that, I discovered I had lost everything that had been stored in the PDA. Big bummer!

I assumed that the fresh batteries were not that fresh and had died overnight. I discovered the error of my ways when I got back home to install another set of fresh batteries. I had installed the "dead" set incorrectly!

At 72 MPH, I could not read the plus and minus labels inside the Palm III battery compartment. Instead, I depended on the battery holder springs. In just about every other battery-powered device I have used, the battery springs are at the negative end of the battery. Not in the Palm III! One spring is at the negative end and the other spring is at the positive end. I installed the batteries assuming both springs were at the negative end. Overnight, the Palm lost power

due to this incorrect battery installation and caused the PDA to lose everything.

Luckily, the Palm survived my mistake and has been running fine ever since. Next time, I stop the car to swap batteries in the Palm and anything else for that matter!

APRS News From Dayton

The following APRS news items came from a variety of sources at the Hamvention: forums, booth-hopping, schmoozing, etc.

Mike Musick, N0QBF, released a new *pocketAPRS* map compilation CD-ROM at Dayton. It has over 200 new maps of U.S. cities generated from the 1999 TIGER data set. Also new is a collection of state and regional maps covering each of the 48 contiguous states and a small selection of basic maps of Europe. The CD is multi-platform compatible (Windows "long names," Macintosh HFS, and ISO-9660). It costs $20 plus $1 shipping. Registered *pocketAPRS* users' cost is $15 plus $1 shipping. Order from the author, Mike Musick, NØQBF, PO Box 8469, Olivette, MO 63132. [The Sproul Brothers announced that the current versions of their APRS software, *MacAPRS*, *WinAPRS*, *XAPRS*, are compatible with these new *pocketAPRS* maps.]

N0QBF also announced that he is working on a new software project called *pocketDIGI*, which will be APRS digipeater software that runs on the Palm III PDA.

Byon Garrabrant, N6BG, released TinyTrakII, a GPS position encoder, which transmits its location at an adjustable rate when connected to a GPS and a radio. TinyTrakII is a kit that provides an inexpensive way to build a mobile tracker without a TNC. You configure TinyTrakII via a computer serial port, while running a simple configuration tool. TinyTrakII is compatible with the original TinyTrak, so original TinyTrak owners can upgrade to TinyTrakII by replacing the original micro controller chip with the new one.

TinyTrakII provides "SmartBeaconing" with corner-pegging, GPS time-slotting for transmission times, position packets in MIC-E or ASCII text format, altitude information transmission, user-selectable sending rate with 1-

second resolution, two storable configurations, transmit hold-off when the GPS position is invalid, force MIC-E format to all printable ASCII characters, and send a status/comment beacon, even when not sending position information. The kit costs $30 from Byon Garrabrant, 8128 Kokoma Dr., Las Vegas, NV 89128, or via `www.byonics.com/`.

N6BG also showed the GST-1 and GST-2 GPS sentence translators. The GST-1 is a device that translates Rockwell Binary format, as used in the DeLorme Earthmate™ and Sony SkyMap™ serial GPS receivers, to NMEA-0183 version 2.0 sentences. The GST-2 is an 8-pin micro controller programmed to translate the binary data output from the Aisin GPS to NMEA-0183 format. (The NMEA-0183 format allows these GPS units to be used for APRS.) The GST-1 and GST-2 cost $45 and $15, respectively.

John Hansen, W2FS, showed two APRS goodies, too. His Kenwood D700 keyboard interface kit allows you to use any PS/2 PC keyboard with the Kenwood TM-D700A transceiver to program and send messages with that radio (instead of using the pushbuttons on the D700A's microphone). As you type the text, it appears on the front panel of the radio. The interface uses the keyboard's function keys to simplify performing common functions (like composing messages and viewing the heard list). The kit costs $40 postpaid; assembled and tested units cost $65.

W2FS also had his PIC-based KISS TNC kit for $60 (or assembled and tested for $95), which was featured in November 2000 *QST*. It has two modes: a 1200-baud KISS TNC mode that is compatible with any APRS software that supports KISS and an APRS tracker mode that beacons your location in APRS format when connected to a GPS.

Both W2FS kits may be ordered from John Hansen, 49 Maple Ave., Fredonia, NY 14063, or via `www.john.hansen.net/` using PayPal.

Youth Forum

I attended the Youth Forum Saturday afternoon. I had never attended this forum in the past, but I wanted to attend because Patrick Clark, KC8BFD, was scheduled to speak on "APRS Benefits in Emergencies." Patrick did a great job explaining how to use APRS as a public service tool and his experiences during some floods in his area of West Virginia. Afterwards, Patrick volunteered to speak at our APRS Forum next year.

The other kids were great, too. Their enthusiasm for ham radio was refreshing. If you ever get the ham radio blues, one cure is to attend the Youth Forum. If that does not instill you with some new life for the hobby, you might as well volunteer to for Silent Keys.

Pizza Party

Saturday night, the APRS Eyeball Pizza Party at Marion's Piazza was a resounding success. We overflowed our allocated space and some of the late-comers had to share space with some of the "normal" clientele, but a great time was had by all. I did a quick headcount and came up with approximately 150 APRSers in attendance. Congratulations to James Smith, K9APR, for organizing this successful event again.

I apologize for the map I drew for the party. When I drew the map at home in Connecticut, I was unaware of the construction detour 700 miles away in Ohio. I hope those who got lost took advantage of the sightseeing opportunities that my error afforded them! Anyways, real APRSers don't need no stinkin' paper maps!

Forum

I had some qualms about the success of the APRS forum. For one thing, the forum was a late addition to the schedule, so it was not listed in the printed programs that were distributed at the Hamvention. For another thing, 9:45 AM on Sunday did not seem to be the best time for by a forum. However, we did have a great list of speakers and I figured who ever did show up, would be happy with what they saw.

As it turned out, we packed the house. We even had some folks in standing-room-only mode. It was very gratifying to see the turnout that the forum received.

Thanks to the speakers who appeared, a virtual who's who of APRS (in alphabetical order): Bob Bruninga, WB4APR, Bill Diaz, KC9XG, Steve Dimse, K4HG, Byon Garrabrant, N6BG, John Hansen, W2FS, Dale Huguley, KG5QD, Mike

Musick, N0QBF, Greg Noneman, WB6ZSU, Keith Sproul, WU2Z, and Mark Sproul, KB2ICI.

Tracks

A week or so after the Dayton had blown over, Ed Collins, N8NUY, emailed me a history file of APRS activity that he compiled during the Hamvention weekend. Over 600 stations appeared in the station list and over 300 in the tracker list. Wow!

Until next time, keep on trackin'.

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$20 Atomic Clock At Wal-Mart
Don Rotolo N2IRZ

No, the clock isn't atomic-powered, but it does automatically synchronize to WWV's atomic time standard every night. Wal-Mart carries a line of clocks manufactured by Chaney Instrument Inc., which use the WWV radio time signal to synchronize their display at 2:00 AM every night.

Look in the furniture department for item number 1773877, which is a black wall clock with a list price of $19.99. If you want an oak-rimmed version, item number 1773884 costs $29.99. Note that these clocks are not carried at their web site.

If you just want to know the correct time, and don't need the Totally Accurate Clock's precision, these clocks represent an excellent value. For more information about the clocks, browse www.atomixtime.com

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The Packet Status Register is the official newsletter of Tucson Packet Radio Corp., a 501(c)(3) not-for-profit scientific research and development corporation. The PSR is made possible by the thousands of US and International members of TAPR.

TAPR's mission is to develop and support "enabling technologies" to further experimentation and development in Amateur Radio and related fields.

If you are not currently a member of TAPR, please consider joining TAPR and helping to support TAPR's many projects such as the PSR that *directly* support Amateur Radio digital communications, such as innovative kits, publications, web pages, mailing lists, and many, many others.

Change To Digipeater Owner's List
Ralph Fowler N4NEQ

Due to the traffic on the regular lists, some digipeater owners may only monitor this Announcement list.

Therefore it is necessary to notify you here of a major change in the list that all digipeater owners should belong to.

The digiowners list has been around for a few years, but has not seen a lot of activity in the past year.

The original host domain for it is gone, so I have moved the list (as well as its archives) to a new host site.

If you were on the list, you have already been notified of the change by an email from the list.

If you are a digi owner, and wish to sign up, just send a blank email message to the following address:

digiowners-subscribe@yahoogroups.com

Thanks,
Ralph Fowler N4NEQ
Digiowners list owner

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Packet Status Register
Upcoming Issues

Note that with this issue (Spring / Summer 2001) and the Winter / Spring 2002 issues, the PSR is attempting to "reset" its cover dates to be more timely)

Issue	Publication Date	Special Coverage	Submissions Deadline
Fall 2001	11/1/2001	Dig. Com. Conf.	10/1/2001
Winter / Spring 2002	2/1/2002		1/1/2002
Summer 2002	6/1/2002	Dayton Hamvention	5/1/2002
Fall 2002	8/1/2002		7/1/2002
Winter 2003	11/1/2002	Dig. Com. Conf.	10/1/2002
Spring 2003	2/1/2002		1/1/2003

Xnet Routing Philosophies and Implementations
Don Rotolo N2IRZ

(X)Net is Packet Network firmware which is compatible with and competes with FlexNet in Europe. For a few years, FlexNet had seen stability (which some read as stagnation), which was recently changed with the introduction of FlexNet/32. Refer to the separate article on this latest update from Darmstadt.

Here the author of (X)Net, Jimy DL1GJI, discussed the Routing philosophies and implementations for his software. Sysops should be familiar with this information, as it will help them build a better node. This also serves as a basic introduction to the inner workings of (X)Net. Further information, as well as downloads, are available at www.swiss-artg.ch/xnet/index.html (look for the links to N1URO's English site as well).

- N2IRZ

Definition
Stage, Link: secured point to point connection of the layer 2.
Bows, Loops: originating through inconsistencies in the Routing table.

1. L3-Routing
By Routing, one understands the search after a way of nodes A and nodes B within a network. If there are several ways, the best interests us. What is the best?

1.1 Expenses - functions
In the amateur-radio, there are two essential criteria after which we can compare two ways together:
1.) Answer-time:
How long does an answer of the counter-station take to get to me?
2.) Throughput:
How many bits per second can I transfer on this path?
With the FlexNet - and NetROM-Routing, these two specifications are different, i.e., one assumes that good throughput means also a good answer-time. FlexNet assesses the different ways with theoretical terms (from 0 to 500s). In the event of multiple paths to a node, the selected path is calculated with the shortest total-term. NetROM-Routers assess the ways with a so-called quality (from 0 to 255). This total-quality is also calculated from the qualities of the stages (hops), and is somewhat complicated. The path is chosen with the highest total-quality. The FlexNet-run times are descriptive also for the users while the NetROM qualities represent a rather abstract code. The Router only uses these numbers for itself for point to point however let's suppose there are 3 possible paths to a node, according to the minimum transfer time route or maximum quality route, is the NetROM quality the only selection sufficient to achieve the best path? If it is decided that a Flexnet route would be best then that is the chosen method.

1.2 Expenses - Investigations
The topic Routing is so interesting in the Packet-Network because RF is subject to permanent fluctuations. Links used at their maximum run well once, bad once, or they are cancelled completely. Sometimes nodes are turned off new nodes arrive etc. Because nobody finds the time and the desire to configure the network again, the routing must take place automatically. Also the data information must exist for routing, i.e., the terms or the qualities of the stages automatically are determined. FlexNet and TheNetNodes use specifically defined "Round-Trip-Time" in each case, RTT-Packet about the term or the quality of a stage permanently too presumptuous. The basis is created with both methods to choose the optimal path amongst the best routes.

1.3 Ways Forget, Route Timeout,
With NetROM, a path must be confirmed to a node again and again (Nodes Broadcasts). Otherwise, NetROM forgets the way after an hour. Only the stable ways are permanently entered in by the direct neighbors and remain. This forgetting of a path after an hour is also only possible with TheNetNode and still today needs to receive a node from the network again. However, through "reverberation-effects", dropping a path can last up to ten hours until a relaxed node vanishes completely from the network. Through a meaningful expenses-waiter-border, one can moderate this cosmetic characteristic:

1.4 Expenses - Frontiers (Count to Infinity)
Which nodes should they take into account with the Routing at all? Always, worldwide, how are all nodes in the destination or Nodes-List represented? If the pure Connect already lasts 10 minutes, the existence of this node is no longer interesting. Therefore, there is an expenses-border in the network, the node-information is relayed. With FlexNet, this border is the total-term of 500 milliseconds. With TNN, it is the minimum-quality (MinQuality) parameter. This expenses-border has however also another important function: because in the network if a node vanishes, this node should immediately be purged from the node-list…Theoretically yes. That is not practical so: one sees that the node remains in the network, merely the quality sinks or the term ascends. Overstep the expenses-border the node, it finally becomes invisible. It formulates differently: give it no expenses-waiter-border, zombie-nodes would create a network with craziness-terms or mini-qualities in the Routing-Table to have large numbers.

1.5 Divided Horizons (Split Horizon)
The principle of the "divided horizon" means that one returns the node-information, that one doesn't get from the one part-network, into this part of the network but relays information to the other networks. One always transports the Routing-Information direct to the front. With network-topologies inheriting this principle is enough to hold crisp information freely about the Routing. The amateur-radio-network has become extremely strong. Sharpen-freedom is not to be reached with this principle alone. Negative feedback is to be solved a method about the problem better.

1.6 Negatives Feedback (Poison Labels)
The principle of the "negatives feedback" goes like "Split Horizon" from similar considerations. While directed Split Horizon "the Routing information only goes to the front", Poison lapels "send back" the information as well but negatively. In NetROM the front the positive Qualities are reported, in backward directional, the Quality is sent as 0.

1.7 Event Updating (Triggered Updates)

The idea is clear, the faster the Routing-Information is relayed, the more quickly the network responds. Alterations in the Routing-Table should be relayed as quickly as possible, however the next problem immediately originates if one makes use of this method too often creating Broadcast Storming.

1.8 Router - Panics (Broadcast-Storms)
Does the Router transmit information too often and too quickly with updated data? Then it can be said that "Broadcast Storms happen. If an important stage is cancelled in the network, all nodes only devote time to the passing of updated routes for seconds. There must be borders for these updating. A possibility is that updating can take place in a minute second at best.

2. Improvement Of The TNN - Routings Through Above Mechanisms
The following describes the like from the above general concept in the node-software of XNet. The compatibility of other protocols to existing NetROM remains 100%.

2.1 Expenses - Frontiers (Count to Infinity)
XNet guarantees that the quality of a node sinks per stage about at least 5 points. The normal quality-calculation, which sinks the quality again, is also made. If for example we put MinQual on 100 everywhere, one can guarantee that the node is not spread further than 31 hop, 5 * 31 = 155. If a node is cancelled, the energy is withdrawn from the "reverberation-effect" and the node vanishes more quickly under the MinQuality.

2.2 Negatives Feedback (Poison lapels)
This principle can be reached ideally with the existing NetROM-Protocol. However not with the station transmitting, as above described but with the receiving station.
Example: that XNet Digi DB0SIG gets the following NetROM-Routing Broadcast from the neighbor HB9AK:
= >monitor -u +4
4:fm HB9AK to DB0SIGS via DB0BAX * ctl UI ^ pid CF
BC SARTG :HB9AK signature: FF [238]
GOE :DB0GOE via DB0EAM 199
GS :DB0GSH via DB0SIG 178

DB0SIG recognizes that HB9AK the node DB0GSH over DB0SIG route. DB0SIG now puts the Quality of DB0GSH in the reverse conclusion over HB9AK on 0:

= >r d

DB0GOE HB9AK 199

DB0GSH DB0LBG-7 200

DB0GSH HB9AK 0

2.3 Event Updating (Triggered Updates)

Every 10 minutes XNet performs a Broadcast of the entire Routing table. Alterations of the Qualities submitted to the network in the meantime that bigger than the set MinQual are added. If nodes are not reached or suddenly become bad, qualities will have plausibility-examinations (DL1GJI) in the event-controlled Broadcast is distributed the NetROM-Broadcasts to all nodes in the same form in principle. Smart routing also is incorporated. If node A broadcasts that it hears node B with a higher quality than how XNET hears node B in a direct path, XNet reacts in that the right quality of node B it sends out with help of the event-controlled updating and removes the Quality size with it. At the moment, these information is simply discarded with the TNN - however exactly with this Plausi-Check has recognized itself with the NetROM-Protocol tie. This case becomes in the on-line-protocol from XNet the Sysop as follows told:

= >log

Log-Messages

Router: Quality of DB0EAM (220) from HB9AK via me (219) too high

2.5 Implementation - Details

XNet works with a Routing table sorted after Call, that essentially contains the Call of the nodes and a referral at the current best Link. In order to refer an L3-Packet, only a binary search is necessary to log N with it after the Time-Call, in order to determine on the Link how the packets trip continues. TNN clatters the complete Nodes-List through n/2 to this in each case.

2.5.1 Quality - Changes

At the moment, it looks with TNN so: the Link quality is measured by the L3RTT. This result is written down into the Routing table. Problem: if the Link now subsides, we have the wrong information for 5 to 10 minutes. If the Link

becomes so bad, that also the Broadcasts are no longer transferred, this wrong-piece of information lasts up to an hour (Route-Timeout-time). With XNet: the Link quality is measured by the L3RTT. The Broadcasts received, but in the original ways stored, as well as, updated. Every 20 seconds in the background, a new Routing-Table from the Link qualities and the present Broadcasts are calculated are stored. Lose a Link now; all nodes that emerge over the path of this Link have their qualities dropped to 0 immediately, and it drops routing for nodes over this Link. If they are found over alternative routes then the best route is chosen or if no routes are available, they fall from the Routing-Table. In the event the Link is restored, the same can take place in the other direction: the Quality of the Nodes increases itself again and routing is as was. Its not necessary for the reception of a new Broadcast to change it, because the old Broadcast is possibly still there, up to 1h in memory.

2.5.2 Shadow - Spreadsheets

Producing of the Routing table takes place through a background-process as to not halt the Digi during the updating of the Routing table. XNet works with two tables: the actual Routing table and a shadow-table for the new evaluation. The tables are exchanged after a new evaluation has taken place, in each case, 2 pointers. The execution of processes and the updating of the Routing-Table happen in parallel consequently.

In that one compares the node-qualities in the old and the new table, one can determine differences and gets updated with the list of the nodes that have event-controlled, Triggered Updates without halting other processes within the Digi making the operation transparent.

2.5.3 Multitasking

The individual layers in each case or several processes is allotted. The synchronization of the processes takes place through semaphores and through coordination-counters. High priority processes, like for example the HDLC-Process of the die time control are running continuously without being stopped, all other Processes will be activated ("triggered") by request and stopped again when finished. The statement "process

switch" in XNet statistics means like often the HDLC-Process will immediately go through. This statement is comparable with the "Rounds per Second" in the TNN.

Value Now min Max

process switch [hz] | 6033 | 2675 | 6235 | - |

The statement / Timer accuracy "

timer accuracy | 60000 | 60000 | 60015 | - |

state exactly how the internal Software-Timers work. In the above case, the maximum postponement amounted to 15 ms in 7 working-days. In the DOS-versions from XNet often sees essentially higher values that originate through hard disk-access.

3. Round Trip Estimation

The "Round Trip" measurements from the KA9Q-kernel is implemented in most Packet-Programs today. With the newer implementations, as XNet, is viewed not only the average-value but also the scatter of the values around the average. The estimated value for strongly fluctuated RTTs is essentially higher than the estimated value for virtually constant RTTs. This procedure fits itself in the practice essentially better the realities on the QRG at.

3.1 Adaptive L3 Lifetime

Exactly in the case where the Routing is not correct one time and bows come into existence, high values of the L3RTT-Lifetime of too incredibly high network worries begin if the packets with maximum speed rotate through several nodes in the circle through. The standard-value of 30 hop is already very high. XNet calculates the Lifetime from the simple formula

lifetime = min(l3lifetimeparameter(280 − Node quality)/5, become in the most decrease with a Lifetime < 30 connects.

4. L4 Transportation - Layer

4.1 L4 Round - Trip

Exactly like in the L2, Time (RTT) can "be measured" in Round trip on L4. This time doesn't need is determined for each Connect however again but its stored as attribute with the respective goal-node and is updated with each Connect to this goal-node. If the Digi now runs longer time, it knows the times to the different goals little by little.

= >r n

3NETNF DL1GWX-7S 6 1616
CHARLY DL1GWX-11 6 3612
Lille F8KOT 3 50000 <= default RTT
ZHGATE HB9AB-10 5 3560
SARTG HB9AK 5 6096
TITLIS HB9AK-14 5 3255

Nodes with those until now still have no existing L4-RTT, one recognizes by the default-value. With this knowledge, one can determine the L4-Timeout-Time dynamically:

4.2 Dynamic L4 - Timeout

The L4-Timeout is similar to the FRACK-Timer in the L2. With TNN, the L4-Timeout is fixed solidly by the Sysop for all L4-transmissions. This L4-Timeout is valid from it then independently whether an L4-transmission goes exactly to the next neighbor or whether 20 hop between it lying. The L4-Timeout can be determined with help of the L4-RTT dynamically.

4.3 Adaptive L4S - TACK

TACK is that on L4 layer of the T2-Timer in the L2. It quite essentially determines the throughput with a transfer. With a Transport-send window length of 10 (usual value) and a TACK-value of 4 seconds calculates itself the at most attainable L4-throughput with the formula:

BITRATE =, TWINDOW * PACLEN * 8, / TACK

$$= (10 * 236 * 8)/4$$

= 4720 Bit/sec

This Bit rate can be maximized in that one reduces TACK, for example (2s). Exactly like on L2 should be fostered the TACK so however that not always for each received L4PDU (PDU = Protocol Data Unit = L4 - "pack") an L4ACK-PDU is generated, network-burden. At least for 1200 baud a value of 2 seconds is already too small since the transmission time of a maximum L4-PDU already amounts L2-Link to 2,280 sec over a 1200 baud.

For TNN, ON5ZS has proposed these improvements and has played in the source text into the boxes.

XNet uses 3 sec as TACK-time standard. In order not to restrict the most possible throughput, XNet sends after at least 5 received and not yet confirmed and processed L4-PDUs immediately

a L4ACK from. Process means that the recipient-process (for example the Host mode program) who has also kept data. Working the recipient slowly, a former TACK doesn't occur with it either.

5. Literature:
Virtually all spoken to concepts are taken following two books. Exception: 2.4 plausibility-examinations, those are from me (DL1GJI). Internetworking with TCP/IP Volume I Internetworking with TCP/IP Volume II authors: Douglas E. Comer and David L. Steven, publishing house: Prentice reverberation
JIMY, DL1GJI,

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ARRL Again Petitions FCC For Primary Allocation at 2300-2305 MHz

The ARRL has again asked the FCC to create a primary domestic Amateur Radio allocation at 2300-2305 MHz. Amateurs now are secondary there. The ARRL first asked the FCC in 1996 to upgrade the allocation there to primary, but the Commission never acted on the request.

"The segment 2300-2305 MHz is of extreme importance to the Amateur Service, especially for weak-signal communications and propagation research, including beacon operation, due to the low noise levels in that band," the ARRL said. The renewed petition was prompted by increasing demands on that portion of the spectrum due to development of new telecommunications technologies.

The Amateur Service has primary allocations in this part of the spectrum at 2390-2400 MHz and 2402-2417 MHz. The ARRL last year sought to have the segment 2400-2402 MHz elevated from secondary to primary, but the FCC has not acted on the request to date. The AO-40 satellite has been successfully using that band for downlink telemetry and transponder operation.

In light of the FCC's stated policy to protect incumbent amateur operation at 2300-2305 MHz, upgrading the amateur allocation there "would constitute the highest and best use of the band at present," the ARRL asserted in its latest filing. "It would also be consistent with the

protection requirements for government and NASA operations immediately below 2300 MHz and the [M]WCS operation above 2305 MHz." Amateur Radio weak-signal work is centered near 2304 MHz.

The ARRL also requested the FCC not to introduce any other users to the band. The FCC has not yet put the ARRL's petition on public notice.

(From the TAPR FCC Regulations Mailing List, dated May 11, 2001)

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FCC Examines Additional Spectrum Bands To Support Advanced Wireless Services

Washington, D.C., August 9, 2001
The Federal Communication Commission (FCC) took action today to examine additional frequency bands that could be used to support the introduction of advanced wireless services, including third generation (3G) and future generations of wireless systems.

The Commission adopted a Memorandum Opinion and Order and Further Notice of Proposed Rulemaking (MO&O and FNPRM) that explores additional frequency bands including bands currently designated for the Mobile Satellite Service (MSS), the Unlicensed Personal Communications Service, **the Amateur Radio Service**, and the Multipoint Distribution Service. Specifically, the FCC seeks comment on reallocating some spectrum in the 1910-1930 MHz, 1990-2025 MHz, 2150-2160 MHz, 2165-2200 MHz, and 2390-2400 MHz bands for new advanced wireless services.

On January 4, 2000, the Commission adopted a Notice of Proposed Rulemaking (NPRM) that examined various spectrum bands for new, advanced wireless services. The bands included those currently used for cellular, broadband Personal Communications Service (PCS), and Specialized Mobile Radio (SMR) services, as well as five other frequency bands: 1710-1755 MHz, 1755-1850 MHz, 2110-2150 MHz, 2160-2165 MHz and 2500-2690 MHz. Numerous comments were filed in that proceeding. The purpose of the adopted MO&O and FNPRM is:

(1) to supplement the record by providing new allocation options that were not addressed in the NPRM; and (2) to seek comment on the benefits and costs of each new allocation option. For example, the Commission seeks to determine how these additional options might work in conjunction with those previously identified in the NPRM to facilitate the provision of new advanced wireless services. The FCC intends to explore spectrum options that would complement, rather than substitute for, alternatives identified in the NPRM. Specifically, the Commission seeks comment on the following:

- The potential for the commercial use of these additional spectrum bands for new advanced wireless services or for the relocation of other incumbent licensees or operators who could be displaced by the final allocation established in this proceeding. - the advantages and disadvantages of these options, including the potential for use of new advanced wireless services in these bands.

- The potential effect of the allocation proposals on existing and prospective users of these bands and the services they provide.

- The effect that allocating these additional spectrum bands, or portions thereof, might have on global compatibility for advanced wireless services, to the extent not identified by the 2000 World Radiocommunication Conference. In order to coordinate today's action with various pending matters involving the 2GHz MSS bands, the item also addresses petitions for reconsideration filed in response to the FCC's recent 2GHz MSS Service Rules Report and Order, and a petition for rulemaking concerning those bands.

In a related action today the Commission adopted a Notice of Proposed Rulemaking seeking comment on proposals to bring flexibility to the delivery of communications by MSS.

Action by the Commission August 9, 2001, by Memorandum Opinion and Order and Further Notice of Proposed Rulemaking (FCC 01-224).

Chairman Powell, Commissioners Abernathy, Copps and Martin, with Commissioner Tristani dissenting in part and issuing a statement.

FCC Contacts: John Spencer (Wireless Bureau) at (202) 418-1896 or e-mail at jspencer@fcc.gov

Linda Haller (International Bureau) at (202) 418-1408 or e-mail at lhaller@fcc.gov

ET Docket No. 00-258

ET Docket No. 95-18

IB Docket No. 99-81

Update on TAPR Frequency Hopping Spread Spectrum Radio
Tom McDermott N5EG
Spread Spectrum Update

There's been a lot of progress on the digital part of the spread spectrum radio, but none on the RF part. The current status of the digital board is:

- Code for the transmit side of the FPGA has been debugged, and the part is successfully performing 2x interpolation, and root-raised-cosine filtering along with timing chain generation for the DACs. A lot of the debugging is done with a to see what's happening with an oscilloscope when the signal is passed through a wider bandwidth filter.

- The Transmit DAC converter is generating baseband I- and Q- signals. The FPGA and TxDAC interpolators are working, and we are generating a baseband 4PSK transmit constellation. The FPGA and the TxDAC each upsample by 2x and interpolate the transmit I- and Q- wave-forms. This 4x oversampling makes the design of the analog reconstruction (anti-aliasing) filters much simpler. The analog reconstruction filters have been checked out and fixed.

- The HDLC and Viterbi decoders have been debugged, and are generating properly coded data to the TxDAC. Software errors for the serial channel ,the HDLC channel, and the SPI interface have been identified and fixed.

- The analog filter and buffer/driver stages have been debugged and gotten operational.

Additionally, a loopback board has been built, and we able to loopback the transmit analog I- and Q- baseband data streams from the transmit to the receive side of the digital board (as analog signals).

- The receive analog buffers, and the I-and Q-analog-to-Digital converters are working, and appear to be properly digitizing the baseband analog signals.

- We are now just starting the checkout of the digital Costas loop demodulator circuitry and associated FPGA RX code.

We had conference calls in March and April to go over status, changes, PC board mods, etc. It should be posted to the TAPR web page as the web master gets time. John Koster came over and took some digital photos transmit constellation. These were taken before several of the analog driver problems were fixed, and now the constellations are even cleaner than those in John's pictures.

Several members of the design team continue with increased workloads at their paying jobs, and this has made getting enough time to work on the project very difficult.

(Excerpted from the May 2001 issue, Volume 15, Issue 4 of Texas Packet Radio Society Quarterly Report. Thanks to Jeff King WB8WKA for referencing this article.)

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PC/Flexnet32
Translated by Don Rotolo N2IRZ
FlexNet32 Brief Description

With FlexNet/32 there is for the first time an integrated and modular solution for all current Windows versions. At the same time, this package serves as a partial update for existing DOS-based PC/FlexNet installations under Windows.

Important Features

All parameters are adjustable via a Graphical User Interface (GUI). No more tedious configuration via the DOS batch file! Drivers can be added and removed during runtime for higher performance and data rates.

Limitations

DOS Applications and 16-bit Windows programs are no longer supported. At this time, not all drivers for the presently available hardware have been developed, but we're working on them. Some drivers only work at this time on specific Windows versions (see table below). There is no Digi (network node) module, but one is presently being developed for at least Windows NT and 2000. It will be then installable as a Service.

Update to existing installations on WIN9x

It is sufficient to un-ZIP FLEX32.ZIP in the existing Flexnet directory. Old versions of the program will be overwritten, but a backup of these old files would not hurt. When completed, the desired functions and programs with all bug fixes and enhancements are ready to operate.

To update to FlexNet32, just allow the system to reboot normally after commenting out the DOS FlexNet module in the AUTOEXEC.BAT file. After Windows starts, FLEXCTL.EXE must be started manually. A link to this program can be placed in the Autostart directory to automate this process.

All that remains is to configure the 32 bit drivers. Naturally, the limitations above are valid for which applications and drivers are available.

New Installations

Un-ZIP the files in the FLEX32.ZIP archive into it's own subdirectory. Start FLEXCTL.EXE and, when desired, add a link into the Autostart directory. It is not necessary to reboot. The channel drivers are installed and configured in the Parameter Menu. The drivers are immediately functional. Any possible resource conflicts or configuration errors are indicated by an icon in the Channel List.

New or Updated Driver Installations

New drivers are simply copied into the FlexNet directory. They are immediately in the driver selection box, ready for use. Please note any possible release notes for specific issues for each driver. For driver updates, be certain to end FlexNet before copying the new files in, and then restart FlexNet when finished.

Table: Available Drivers for FlexNet32

Driver	Win9x, WinME	NT 4	Win 2000
6pack	X	x	x
Ser12	-	-	-
Par96	X	x	x
AXIP	X	x	x
AXIPX	X	x	x
EPP	X	x	x
IPAX	X	-	-
KISS	X	x	x
PR430	X	x	x

- (D)K7WJ

(Translated by N2IRZ. All errors in translation are mine!)

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From The Editor
Steve Stroh N8GNJ

First, my apologies for the tardiness of this issue. President John Ackermann's recent letter to the membership stated that this issue would be available no later than August 1st, and it wasn't. The delay was entirely my fault, and I humbly apologize to the TAPR membership.

As I type these characters, words, and paragraphs it seems a bit surreal, and very humbling, that I'm actually editing the TAPR Packet Status Register. When I first became involved in Packet Radio in the mid-1980's, I remember vividly putting aside *everything* to read the PSR when it would arrive. I owe a great debt to TAPR, and especially the various editors and authors of articles in the PSR. I got involved in Amateur Radio as a direct result of TAPR's work, and Packet Radio ultimately proved to be a gateway for me into my current career as an Independent Technical Writer specializing in Broadband Wireless Internet Access.

I used this quote for Sir Isaac Newton in my first Digital Wireless column in CQ Amateur Radio Magazine, and it applies equally well to my editorship of the PSR: "If I have seen further it is by standing on ye shoulders of Giants." Two of my "giants" in the PSR are Gwyn Reedy W1BEL, a past Editor of the PSR and the late, and very lamented Packet Radio Magazine during my "formative years" in Amateur Radio. The other is my immediate predecessor as PSR Editor, Bob Hansen N2GDE, who has set a mighty standard of quality for the PSR.

For the first time, you're reading an issue of the PSR both created *and* distributed digitally; ironically, the first time the PSR could (relatively easily) be transmitted via Amateur Radio digital communications. The decision was made to use Adobe Acrobat instead of alternative formats (such as plain text) because it allows considerable flexibility in layout, which will be preserved when the reader sees the PSR. The electronic format provides a number of new capabilities such as hyperlinks embedded in the text. Color photographs are now possible – the cost of duplicating color in the paper version of the PSR was prohibitive. Lastly, though it's a subtle "capability" and not very well reflected in this first electronic issue, the PSR can "grow" to be as large as need be. TAPR was severely limited in the size of the PSR for postal mailing, and that limitation is now removed. Using Adobe Acrobat, the layout of the PSR is primarily designed to be printed out (although, of course, it certainly can be read on screen). For viewing the PSR, I recommend obtaining Acrobat version 5 (the most recent at this writing.)

In becoming Editor, I'm very lucky to have the enthusiastic and very capable assistance of Stan Horzepa WA1LOU and Don Rotolo N2IRZ. Stan is the Digital Dimensions (and prior to that, Packet Perspective) columnist in QST since, well, since QST has *had* a digital column. Stan began his new column, APRS News and Commentary, in this issue of the PSR.

I first became aware of Don through his Digital Data Link column in (the late, and very lamented) CQ VHF Magazine. Don is fluent in German and as part of his job, regularly travels to Germany, where there is a high-speed Packet Radio network that is the envy of Amateur Radio network operators in most other parts of the world. Don is also skilled at newsletter layout, and I expect to make good use of Don's talents in this area beginning with the Fall 2001 issue of PSR to incorporate digital photographs from the upcoming DCC. Don's first installment of translated material from Germany appears in this issue of PSR.

In future issues of PSR, you will notice more articles about "commercial" wireless digital communications, such as the very popular 802.11b Wireless Local Area Network standard. We, as Amateur Radio operators, *need* to know what is going on in commercial "digital" wireless, and sadly, many of us don't.

ARRL and TAPR 20th Annual

Digital Communications Conference

September 21-23, 2001 • Cincinnati, Ohio

www.tapr.org/dcc

Information

Mark your calendar and start making plans to attend the year's premier event in digital communications. The 20th Annual ARRL and TAPR Digital Communications Conference will be held September 21-23, 2001, in Cincinnati, Ohio - just minutes from the Cincinnati/Northern Kentucky International Airport in Covington/Cincinnati, KY. The ARRL and TAPR Digital Communications Conference is an international forum for radio amateurs in digital communications, networking, and related technologies to meet, publish their work, and present new ideas and techniques for discussion. Presenters and attendees will have the opportunity to exchange ideas and learn about recent hardware and software advances, theories, experimental results, and practical applications. The Digital Communications Conference is not just for the digital expert, but also for digitally oriented amateurs of all levels of experience.

A Conference for the Beginner as well

The conference is not just for the digital expert. As in years past an entire session strand with beginning, intermediate, and advanced presentations on selected topics in digital communications will be offered. Some of the topics will include: APRS, Satellite Communications, TCP/IP, Digital Radio, Spread Spectrum and other introductory topics. Come to the conference and hear these topics presented by the experts!

Symposia, Seminars and Banquet

Two symposia/seminars will be held which allow those with additional time and interest to make the most of the Conference. For those who may have interest in just one symposium or seminar, registration for the conference is not required to attend these activities. This allows maximum flexibility for those who may want to participate during the Digital Communications Conference, but do not have an entire weekend to devote to the event. This year the Fifth Annual APRS National Symposium will be an all day event Friday moderated by Steve Dimse, K4HG (the developer of javAPRS and www.findu.com). It will likely include many APRS software authors, such as Bob Bruninga, WB4APR (the father of APRS), Keith Sproul, WU2Z, Mark Sproul, KB2ICI (the developers of MacAPRS and WinAPRS), Brent Hildebrand, KH2Z (the developer of APRSPLUS), Mike Musick, N0QBF (developer of PocketAPRS), and other nationally known APRS leaders. Join this group for the afternoon and evening for in-depth discussions and presentations on the current and future status of APRS. This is a unique opportunity to gain insight into this fast-growing digital aspect of amateur operations that combines computers, packet radio, and GPS (Global Positioning System). (continued)

Area Attractions

Distance from the conference hotel: Turfway Park, Horse Racing (2 mi), Argosy Casino (12 mi), Cinergy Field, Red's Baseball (8 mi), P. Brown Stadium, Bengal's Football (8 mi), FirstStar Center, Cyclones Hockey (8 mi), Aronoff Center for Performing Arts (8 mi), Newport Aquarium (6 mi), Cincinnati Zoo (10 mi), Grand Victoria Casino (21 mi), Kentucky Speedway (30 mi), Gap Outlet Shopping (3 mi).

Co-Hosts

The 2001 ARRL and TAPR Digital Communications Conference local co-hosts will be the **Southwest Ohio Digital Symposium** w3.one.net/~rkuns/swohdigi.html

International Co-Hosts

PRUG (Packet Radio User Group of Japan) will be the International co-host for a fourth year running. PRUG will be hosting an informal social Friday evening before their seminar and symposium is held. Visit www.prug.or.jp for more information about PRUG.

Call for Papers

Anyone interested in digital communications is invited to submit a paper for publication in the Conference Proceedings. Presentation at the Conference is not required for publication. Papers are due by **August 6th, 200**1, and should be submitted to
Maty Weinberg, ARRL
225 Main Street
Newington, CT 06111
or via the Internet to
lweinberg@arrl.org
Information on paper submission guidelines are available on-line at www.tapr.org/dcc

On Saturday night the DCC Banquet will be held. A guest speaker will speak after the banquet and a prize drawing will top the evening. The Sunday morning seminar will be on **Simulating Circuits and Systems with *Serenade SV*** presented by Dave Newkirk, W9VES, of Ansoft Corporation. Dave will show you how Serenade SV is like having a RF/Microwave communications lab in you computer. For more information about Serenade SV and free download see www.ansoft.com. Also, see Dave's article in the January 2001 *QST*.

Hotel

Conference presentations, meetings, and seminars will be held at the **Holiday Inn Cincinnati – Airport and Conference Cente**r. It is highly recommended that you book your room prior to arriving. A special DCC room rate of **$89/single** and **$89/double** per night has been blocked for 50 rooms and is available until September 1, 2001. Once the 50 rooms have been reserved, room rates will increase. So be sure to book your rooms early! The hotel provides transportation to and from the Cincinnati/Northern Kentucky International Airport. Please contact the hotel to arrange specific transportation needs.

Holiday Inn Cincinnati – Airport and Conference Center
1717 Airport Exchange Blvd.
Erlanger, KY 41018
Phone: 859-371-2233 - Fax: 859-371-5002
www.basshotels.com/hotels/cvgap

What you can expect at DCC 2001

• A full day of papers and breakouts for the beginner to the advanced
• Two seminars/symposiums
• The sixth annual Student Paper session.
• A banquet with Special Guest Speaker.
• Informal get-togethers throughout the weekend.
• TAPR Membership Meeting
• An event at which the most important new developments in amateur digital communications are announced.
• Digital 'movers and shakers' from all over the world in attendance.

There are few activities where your participation can be **so much fun and important!** What a great way to share and renew your enthusiasm for digital amateur radio! A get-together with colleagues and bringing each other up to date on your latest work -- all this, and more, for an unforgettable weekend of amateur radio and digital communications. We hope to see you at the ARRL and TAPR Digital Communications Conference on September 21-23, 2001!

Full information on the conference and hotel information can be obtained by contacting:

Tucson Amateur Packet Radio
Phone: 972-671-8277
Fax: 972-671-8716
Email: tapr@tapr.org
Web: www.tapr.org

Registration Form

Contact the TAPR office by Phone 940-383-0000, Fax 940-566-2544, or Internet: www.tapr.org and tapr@tapr.org to register or for additional information. Conference Registration includes: Conference Proceedings, Sessions, Meetings, and Lunch on Saturday.

• Pre-Registration (before Sept 1st) $45.00 _____
• Registration (after Sept 1) or at door $55.00 _____
• Saturday Evening Dinner (Limited Space)
Dinner with Guest Speaker
Prize Drawing $30.00 _____
Symposia/Seminars
• 5th Annual APRS National Symposium
Friday, 9am - 7pm $25.00 _____
• Sunday Seminar
Simulating Circuits and Systems with Serenade SV by Dave Newkirk, W9VES
Sunday, 8:30 am - 2 pm. $20.00 _____

                                   TOTAL _____

Name/Call: _____

Street Address: _____

City/State/Zip: _____

Country: _____

Phone Number: _____

Email: _____

Charge my credit card (circle one):
VISA MasterCard
Acct: _____

Exp. Date: _____

Signature on card: _____

Mail completed registration form with check to:

TAPR
8987-309 E Tanque Verde Rd #3378
Tucson, AZ 85749-9399

Or check www.tapr.org/dcc for an on-line registration form.

A registration packet will be mailed in September upon receipt of registration form and payment.