President's Corner
by Lyle Johnson, WA7GXD

The ARRL Digital Committee met in Newington, CT, over the weekend of 23 May. Several issues were discussed, including packet frequencies for HF and VHF, the automated message handling STA for HF, changes to the AX.25 Level Two specification, message handling protocols, and progress reports on networking protocols.

Many of the above-mentioned items are under study by various subcommittees.

One point agreed upon is the means of identifying an HF packet frequency. In the past, many of us have simply used the display frequency when operating lower sideband with the “TAPR standard” HF modem tone pair of 1600/1800 Hz.

In the future, we will be referring to the center frequency of the actual transmitted energy.

Thus, 14.109 MHz of yesterday becomes 14.109,000 - ((1600 + 1800)/2) = 14.1073 MHz.

The disadvantage is that very few rigs have an FSK mode such that the dial reading corresponds to the energy being transmitted. The Great Social Equalization Factor (GSEF...) is that now everyone can be confused; there is no bias in favor of using “TAPR standard” 300 baud tones for a convenient dial reading!

To add fuel to the fire, yet another set of suggested frequencies has evolved for message forwarding use. (Especially on 20 meters, folks are encouraged to move their QSOs to the standard ATTY area, below 14.1 MHz.)

Message forwarding frequencies of 14.1023 and 14.1083 MHz are suggested in North America. A move to these frequencies will probably occur at the time of the HF STA. Please do not use these frequencies for casual QSOs — they are intended for message handling.

A number of inputs were received regarding modifications to the AX.25 Level Two protocol. They are currently under study and will be reported to the Committee at its next meeting, scheduled for the weekend of August 29 in Los Angeles in conjunction with the 6th ARRL Computer Networking Conference.

(That meeting took place at the Torrance Marriott Hotel. A special meeting is to be convened in early October in the Washington, D.C. area to work on AX.25 Level 2 Versions 2.1 and 3.0. 2.1 will likely be a “bug fix” interim specification, while 3.0 should provide an opportunity to add a whole slew of new bugs... Keep those suggestions coming in!)

Please note that the Committee meetings are open to observers. In fact, the May meeting had only 6 committee members present along with 10 observers!

On to other topics.

The first 200 units of the TAPR PSK Modem kit are in the hands of their builders. The complete kit costs $100 plus $10 Shipping and Handling in North America. Bare board sets with instructions will be available for $30. The second lot of 200 kits is now being

Continued on page 2
An Introduction to TCP/IP

Millions of folks have used it in conventional commercial, military and government telecommunications applications. Few of them ever realized it, or really cared.

Since the introduction of TCP/IP into the packet radio world by Phil Karn, KA9Q, we are hearing it discussed more and more frequently. Being the type of folks that Amateurs are, they want to know more about it. Unfortunately up until June 1987 there was little easy-read material available on the subject, unless of course, you were a networking engineer, designer or writer of networking code.

In June Mr. Charles Hedrick at Rutgers University wrote a paper describing TCP/IP in terms that most of us can understand. For those wishing to dig deeper into TCP/IP Hedrick makes many references to documents (called RFC’s) which permit one to explore as far as wanted.

A package of two diskettes “Introduction to TCP/IP” (MSDOS, 360K) is now available. They contain Hedricks paper (about 92k) and most of the RFC’s he refers to. (as many as will fit in compressed format on 2 disks, unARC utility also provided).

To augment the Introduction paper Bdale Garbee, N3EUA, has prepared a Preface which introduces the reader to the amateur packet radio version of TCP/IP. Bdale is one of the writers of code for the packet radio application of TCP/IP.

In keeping with the Rocky Mountain Packet Radio Association charter of providing “information and education in amateur digital communications”, one of the RMPRA founders is providing this service.

Send: Two dollars to cover costs (foreign add appropriate additional for foreign mailing costs, 2 oz., IRC ok).

A mailing label with your address on it.

To: Andy Freeborn N0CCZ
   5222 Borrego Drive
   Colorado Springs CO
   80918

DO NOT send mailers, diskettes or postage. But DO send the completed label.

Update on the the KA9Q TCP/IP Software

Announcing an update to the KA9Q TCP/IP software package release of 870526.0, bringing the current release date up to 870829.0. This update adds fixes bugs, and adds some minor functionality. A new release will occur in a couple of weeks with support for 4bsd and sysV unix machines, this version still supports only the PC and PC clone class of machines.

The changes:

- Improved KISS bits for the TNC1 from Gerard, PA0GRI.

- the ASCII text at the top of one of the TNC2 hex files is gone now.

- Minor tweaks to BM from Gerard, PA0GRI, Phil KA9Q, and yours truly. Biggest noticeable differences are that BM no longer looks at the hosts.net file at all, but instead passes symbolic hostnames to the smtp client in net... and we once again changed the text entry code. It’s more like bsd Mail now. Default is a silly text entry routine, a “~e” gets you into your favorite editor, and a “~p” shows what you’ve typed so far.

- NET.EXE understanding of symbolic hostnames ala the hosts.net file has been extended. You now need to wrap numeric IP addresses in square brackets, as in “[44.32.0.16]”, as you can use symbolic names anywhere you need to use an IP address (including in the autoexec.net file!)

- Since BM no longer deals with IP addresses, a “gateway” command has been added to NET.EXE, so that it knows where to send mail that fails the lookup in hosts.net.

- Internal changes and a fix to the ftp server so that it now handles NLST command properly, all from Phil, KA9Q. Bugs that were in the 870526.5 interim release that was only distributed in a limited fashion apparently disappeared with the latest tweaks...

- documentation has (as usual) been updated somewhat.

- some other random tweaks I’m sure I’ve forgotten...

What to do once you have software, aka “getting an IP address”:

Users of this software package become part of the “global IP internet”, and as such need to obtain unique IP address assignments for each host they plan to put on the air, or “on the wire”. Major metropolitan areas in the US, and countries with active TCP-using groups probably already have blocks of addresses in amateur radio 44.X.X.X block assigned to them. Ask around locally before you go any further.

If there is no local address block in your area, and/or no one is coordinating address assignments for your local net, contact Wally Linstroth WA6JPR. Wally is the global top-level address administrator for the ham radio 44.X.X.X
subnet. Wally may be reached by email at
wally%net1.ucsd.edu@sdcsvax.ucsd.edu
or wally@net1.ucsd.edu
or wally@winfree.uucp
or wally%winfree.ucup@flash.belcore.com

or via the new forwarding mechanism I
have set up for those sites who know
how to reply via mail to this message,
but can't reach Wally's machine directly:

winfree/wally
or wally@winfree.uucp
or wally%winfree.ucup@flash.belcore.com

How to obtain the KA9Q Internet soft-
ware:
- Via uucp, the files are on winfree in tar
archives as:

/usr/spool/uucppublic/pub/
ka9q_all.tar.Z 16 bit Compress 4.0
/usr/spool/uucppublic/pub/
ka9q_all112.Z 12 bit Compress 4.0

For Anonymous UUCP login, use phone
number 303/593-0696, at 2400 baud (it
will do 1200 if you send a return to rotate
it down), "standard Unix login se-
quence", username of "Uanon", pass-
word of "notFTP". An example L.sys
entry ala winfree's uucp would be:

winfree

Any ACU 2400 13035930696
login: Uanon
password: notFTP

I've never run an anonymous login for
uucp before, so let me know if I got it
wrong!

A reasonable command to issue to pick
up the 12-bit distribution would be

uucp winfree!~/pub/ka9q_all112.Z/usr/
spool/uucppublic

My BBS is currently down with a dead
hard drive. If anyone has a spare drive
they would be willing to donate to the
cause, *please* get in touch with me
ASAP! Cashflow around here is a joke...

Normally,

Via Opus, log in to my BBS and down-
load from the appropriate files area.
There are several .ARC files for the full
distribution, one for each of the direc-
tories. SeaDog file requests are ok.
I have configured my BBS to allow first
time users ample resources to down-
load the full distribution at 1200 baud.
The phone number is 303/593-0766.

If you have any trouble downloading
from the BBS, please let me know.
Speeds that are supported include 300,
1200, and 2400.

-Via US Snail, Andy Freeborn N0QCZ
has agreed to make floppy copies. To
get a copy from him, send $5 AND a
completed return address mailing label
(orders without a mailing label will be
considered contributions to the BBS
hard drive fund, see above... :-)

Andy Freeborn, N0QCZ
5222 Borrego Drive
Colorado Springs, CO 80918
USA

What you get for the $5: 5 floppies,
including two of RFC's and IEN's that
relate to the code, two that include the
actual release, and one that is intended
to be a sort of "plug and play" disk for
getting on the air immediately...

For those who just want the RFC/IEN
disks, Andy will send you just those
two disks for $2 and a mailing label. If you
want any particular RFC or IEN, contact
Andy to find out what archive it is in (we
have them all packed up, one ARC per
360k pc disk), and he will send you that
RFC or IEN, along with many others, on
a floppy for $1/disk. You can't mix and
match, you get the block of documents
that are in a given archive.

DO NOT SEND floppies, mailers, post-
age, etc... but DO send the mailing label

Andy is also reachable as
winfreelandy or
andrewinfree.uucp@belcore.com

if you need more information (?). Andy
is within an on-air FTP of me, so we
should be able to keep his bits up to
date!

on the ARPAnet, or attached portions of
the Internet, look on
louie.udel.edu
via anonymous FTP for the files in the di-
rectory
pub/ka9q

-Within a day or two of a new release,
the code should also be available from
the following additional secondary dis-
tribution points:

from Doug KD4NC in Atlanta, GA
uucp: winfree@kd4ncidug

from Bob Hoffman N3CVL in Pitts-
burgh, PA
arpa: rhb@cadre.dsl.pittsburgh.edu
uucp: pitthoffman
from Wally Linstrugh WA6JPR in
Santa Barbara, CA
arpa: wally@net1.ucsd.edu
from Brian Kantor at UCSD. (via
anonymous FTP?)
arpa: tcp-group-
request@sdcsvax.ucsd.edu
uucp: sdcsvax/tcp-group-request

Unreleased (read: under development)
versions are often available on
louie.udel.edu, generally alongside offi-
cial releases...caveat emptor...

If anyone has any trouble getting hold of
a copy of the code, please let me know!

How to contact me:

Bdale Garbee, N3EUA
1433 Territory Trail
Colorado Springs, CO 80919
303/590-2868w,
303/593-9828h

*** go easy on the phone calls please,
I'm not getting much sleep ***

uucp: (belcore,crash,hp-
lst,nc,plitt,vixie)@winfree@bdale
arpa: bdale%winfree.uucp@flash.belcore.com
bdale@net1.ucsd.edu
fido: Bdale Garbee at 128/19, 303/
593-0765, 300/1200/2400 baud, 24hrs
(*DOWN*)
packet: n3eua @ koho

Note from the Editor

I need your help. With PSR back on its
own, I need material from packet groups
around the country for sharing in PSR. If
you've got news to share, articles to
contribute, or just want to comment pro
or con on something we're doing right or
wrong, please send your material to me
directly:

Scott Loftesnes W3VS
16440 Rustling Oak Court
Morgan Hill, CA 95037

or send it to me via electronic mail:
Packet: W3VS@AA4RE
CompuServe: 76703,407
MCI Mail: SLoftesnes
AT&T Mail: SLoftesnes
Digital Signal Processing, or DSP, is a hot topic in the world of analog circuit design these days. And it's becoming a hot topic in the Amateur world (meaning that the costs are finally getting realistic).

This article is intended to be a very brief overview of DSP - what it is and how it may prove useful to packeters and other segments of the Amateur community.

DSP - WHAT IT IS

A DSP system design consists of an input filter, usually quite simple to perform a function called "anti-aliasing." This is simply to protect the following circuitry from signals far out of the design passband.

Following the filter is an analog-to-digital converter (ADC). This device samples the input signal and converts the amplitude to a digital number. While accuracy requirements of the ADC vary from application to application, a 10-bit ADC driven at about a 20 kHz sampling rate will probably suffice for the majority of Amateur DSP applications.

The output of the ADC goes to the microprocessor (uP). In this case, the uP won't do. DSP requires the rapid execution of a small set of instructions.

DSP - WHAT IT CAN DO

DSP is simply a means of processing a signal by digital means.

Analog processing applications that you may be familiar with include Audio CW generators for SSB transmitter testing and the 1200 baud modem in your TNC.

In general, anything you want to do to an audio signal, whether it be generation, modulation or filtering, can be done using DSP techniques.

The advantages of DSP include (1) uniformity and repeatability of a design and (2) one general-purpose hardware design can be reconfigured under software control to do many different tasks.

Software???

Yes, DSP allows software hackers to mess around with traditional hardware areas. Is nothing sacred?

Some of the guys playing with the AMSAT/TAPR DSP seed project (notably Tom Clark, W3IWI and Bob McGwier, N4HY) have already done some pretty amazing things. How about a PSK modulator to test the TAPR PSK modem demodulator? Or a PSK demodulator to check the PSK modem modulator? Or an audio spectrum analyzer? Or a weak signal detector so an OSCAR-10 class station can detect its own MOONBOUNCE signals! These applications have already been tested in at least a preliminary form by these two!

Want a tracking, adaptive HF modem? How about a WEFAX demodulator? Or a 2400 baud telephone modem? Or a 9600 baud packet modem that will work on your current voice radio?

The list of applications goes on and on.

DSP - CURRENT PROJECT

The DSP seed project, being sponsored by AMSAT and TAPR, will provide about 20 or 25 Delanco-Spry PC cards. These cards plug into an IBM PC or compatible, and include a TMS32010 processor, 48k bytes of high-speed, dual-ported memory, an input ADC and output DAC, and support EPROMs normally costing nearly $1,000 each. Delanco-Spry is making us a special deal for between $500 and $600 per unit.

This project will, hopefully, serve as a software development bed. Tom Clark likens it to the early days of using 8080s in an S-100 bus computer running CP/M. It isn't the fastest or the greatest, but it is useful and the algorithms (approaches to solving a problem in software) developed should be usable in later-generation Amateur DSP devices.

Moving towards the front burner is a project to develop an Amateur DSP "engine" tailored to Amateur needs. Instead of expensive 16-bit ADCs and DACs that can clock at 50 kHz, 10-bit ADCs and DACs running at 20 kHz may suffice, saving many dollars. Likewise, including enough, but not too much, fast memory, will save more dollars. Finally, using volunteer engineering, we hope to develop a useful, general-purpose DSP device suitable for a broad spectrum of Amateur applications.

No details are yet available as to cost or exact configuration. My personal goal is to have a TMS320C25 with the aforementioned ADC and DAC capability, a minimum of 64 kbytes of memory, expandable to 128k bytes (the limit of the TMS320C25), sitting on a IBM PC card for about $500. Maybe less. This is about 1/5 of the cost of a comparable commercial DSP card.

This would be followed by a stand-alone box, with serial ports or perhaps a SCSI bus, probably for less.

Of course, I am a dreamer, and others tell me it would cost closer to $1,000.
As the technology progresses, the prices will drop. Watch this space for further developments...

Digital Signal Processing and Amateur Radio
by Bob McGwier N4HY
15 Cherry Brook Lane, East Windsor, New Jersey 08520

In the past several years, digital signal processing and related areas have made a significant impact on the telecommunications industry and government communication facilities. To date amateur radio has not participated to the fullest possible extent in the benefits made possible by the techniques of digital signal processing mainly because it has been too expensive to include the techniques in our cache of communication tools. In the past few years, the silicon revolution has overtaken digital signal processing and have made it too inexpensive to let it pass us by without using it. Arguably, the most popular family of digital signal processing chips are those produced by Texas Instruments and are the TMS320 family but there are several others, most notably the DSP56000 family by Motorola.

These techniques and chips make possible a wide range of exciting capabilities. Changing modems is as quick as changing the software program on the TMS32010 rather than a couple of dozen IC's (TAPR/JAMSAT JAS-1 PSK modem). This same software with a minor modification can be made a JAS-1 PSK modem. The project is looking for a few proven producers who do not mind spending $525 for these boards to help the project produce a new board for amateur radio. You do not have to be a signal processor or a TMS320 assembler code hack. We would like those types of people to sign up for this project but we are also looking for people who can write applications software in "C" or assembler for the PC. We are currently emphasizing MSCP, Turbo-C, and MASM as the development tools for the PC environment. We are looking for a few proven "beta test" types. If you are one of the types who signed up for beta test packet boards without really understanding what was in them, we also need help from you.

The long term goals are the involvement of TAPR/AMSAT and some amateur industry leaders in the production of a digital processing product for amateur radio. We envision software that will run on this product to include (but not be limited to) modems of many varieties, optional WEFAX-APT demodulation, voice encoding (LPC-10 and ADPCM for example), weak signal work, and test equipment. We are leaning towards a board with the TMS320C25 on board but the final decision has yet to be made and will probably be put off until we have more from those of you who "join up". We have already been approached by A.E.A. and Kantronics, who are expressing support and a desire to participate and more are sure to follow.

To date we have had some initial but very exciting success with these boards. Tom and I have seen each others echo's off the moon running Fast Fourier Transforms on these boards. Each of us was running an AO-10 class station without a lot of aluminum in the air. I have written a demodulator which locks to and tracks the JAS-1 PSK downlink quite well. I am putting a remodulator into the code so that JAS1 can be decoded by a stock TNC without modification. The FFT software also acts as a very valuable piece of test equipment, a spectrum analyzer. None of these things are completed and the others haven't even been started. DSP NEEDS YOU! Contact us via callbook address for W3IWI, AMSAT office, TAPR, or myself.


[5] TAPR, Inc. P.O. Box 22888, Tuscon, Az. 85734

In the Mailbox
by Roy Engehausen, AA4RE
780 Lisa Court
Gilroy, CA 95020

I saw a definition of a "committee meeting" as one where the attendees figure out who is absent and assign the work to them. I guess that's what happened in my case when I was asked to provide some news on BBS happenings.

Latest Software/Hardware

New releases of code have been made recently by W0RLIVE3GQY (Version 3.3), K2BQE (95c), and W7MBL (3.20). All three systems now support forwarding thru the various level 3 systems. The executable program and source code for the first two are available from the authors while K7PKY distributes the executable MBL system. All are free with a diskette and SASE mailer. The W0RLIVE3GQY program is also available from CompuServe (in the DL9 Data Library).

An interesting footnote is the fact that a feature has been removed. The current MBL code and the next W0RLI release...
will have the fixed portion of the forward header built in. Too much software is now trying to deduce the origination point of a message via the headers to allow changes to the fixed fields. A header is shown below with just the fixed fields. Additional information such as frequency can follow these.

The MINIX Operating System is a variation of UNIX and was written by Andrew S. Tanenbaum as a teaching aid for his text book "Operating Systems: Design and Implementation" (ISBN 0-13-637406-9) published by Prentice Hall, Route 59 at Brook Hill Drive, West Nyack, NY 10995. The book sells for about $35. Both the executable code and source are also available from Prentice Hall for another $80. Yes... I did say the source is available. The package also includes a simple "C" compiler. Updates to MINIX are free via USENET.

There is a dark lining in our silver cloud however. Unfortunately MINIX is its own operating system and will not run MS-DOS applications without extensive rewrite. It uses its own disk format and you will have to take care on how you organize your fixed disk if you wish to switch back and forth between MS-DOS and MINIX. In addition, Tanenbaum used direct interface to the hardware instead of BIOS so MINIX will not run on all the clone variations. This is being slowly rectified.

Food for Thought—One Man's Opinion

The most controversial issues facing BBS operators today is the universal addressing scheme both for regular amateur mail and for NTS traffic. There seems to be two camps of thought: Telephone area codes and Postal zip codes.

One thing seems to be clear though: A separate system is needed for NTS traffic. It is an unfortunate fact of life that amateurs who are interested in NTS are few. Many mailboxes do not have someone who checks in regularly to deliver NTS messages in the local area. Thus the target mailbox for NTS to my home city of Gilroy and the mailbox used by the local hams are different. However we route inter-ham messages we must make provision for routing NTS differently.

At a meeting this summer attending by both packeters and NTS people in the ARRL's Hudson Division, the scheme of NTSxx (xx = area code) was proposed. Discussion of this idea has taken place in many media: voice, mail, packet, and electronic conferences and alternatives of xxxxx (xxxxx = postal zip code) and NTSxxx (xxx = first 3 digits of zip code) have appeared.

I think the first conclusion is also obvious; whatever is selected for NTS should be used for a general scheme and vice versa so let's discuss a general scheme.

CA #: 8843 O: YB1BG

Let's square off zip code versus area code.

First: Zip code is a lot more selective. A single zip can contain a maximum of 30,000 to 50,000 people which would probably fall out to about 100 hams. That would be coverage for one or two BBS. Area codes can cover whole states. If you add the telephone exchange number (e.g., 408847) then you equal zip code's efficiency. The same addressing problem exists if you only use the first 3 characters of the zip code.

Second: Zip code is fairly logical. A station on the East Coast will simply have to know to route everything starting with "9" to the other coast. Both the WA7MBL and WORLI BBS programs accept wildcards to allow this to be done efficiently.

Third: Zip code is in the Callbook. If you wanted to route a message to me, you would simply look up my address in the call book and send the message to AA4RE @ 95020. Thus we have our own "directory". In addition, you can purchase the zip code directory from the Postal Service which shows city and zip code. To find what Gilroy's telephone area code and exchange prefix are is not as easy.

The major disadvantage to zip code is the difficulty of addressing areas outside the US. It can be said that adding the telephone country prefix to the area code, we can address the world. I just tried to look up the prefix for Japan. My phone book says to call the operator for that information. I don't even know what the US prefix is so how can I give it out.

If we put an indicator on the front of the address to show the country, then it will be up to the hams there to decide on how they want to address messages. Let's see what a typical address would be:

W-95020

The W indicates the US. We all know and understand the amateur call sign system both for US and for DX. Let's use it. A Canadian address might be VE6K7P1M. Some may argue that this exceeds the present day 6 character maximum limitation on the @BBS field but I am sure that the software experts

The TEXNET people are about to start and BBS system suitable for remote site installation. This is both hardware and software. A complete and thoroughly tested layer 3, 9800 baud network nodes is expected to cost about $650 to $700 for the entire node, radios (2), the NCP, parts, power supply and antennas excluding feedline. This cost does not include the BBS. Contact WDSHUP for details.

Developments

One of the biggest complaints I hear these days about BBS operation is that the mailbox is always busy. With forwarding every hour, multiple ports, etc, the availability of a BBS for a given user has been steadily decreasing. Both the WORLI and KA2BOE systems have attempted to supply some relief by running two copies of the software using a multitasker like DoubleDos but this has always been a kludge.

On the West Coast, two multi-connect systems have been in operation. Mike, W6IXU (of NETROM fame) has had a system on a Macintosh for several years while Eric, WD6CMU has been running one under OS/9 (a 68000 based UNIX clone) for a year or so. Needless to say, the hardware cost involved as compared to a Taiwan PC/XT clone has prevented widespread acceptance of these mailboxes.

This is about to change. Using the MINIX operating system, Bill, N6FOR, has successfully adapted most of the WD6CMU program to the PC 8088 hardware family. This software will support both multiple ports and multiple connections per port. I have watched W6IXU and WD6CMU forward mail to each other (thru NETROM) simultaneously. The mailbox is not yet in production use nor is it ready for distribution but should be by year end.

Under the current implementation, the TNCs must use the WABDED (also of NETROM fame) host mode protocol. This is available for both the TNC-1 and TNC-2 either from the author or CompuServe.

Contact WOSHJP for details.

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Second: Zip code is fairly logical. A station on the East Coast will simply have to know to route everything starting with "9" to the other coast. Both the WA7MBL and WORLI BBS programs accept wildcards to allow this to be done efficiently.

Third: Zip code is in the Callbook. If you wanted to route a message to me, you would simply look up my address in the call book and send the message to AA4RE @ 95020. Thus we have our own "directory". In addition, you can purchase the zip code directory from the Postal Service which shows city and zip code. To find what Gilroy's telephone area code and exchange prefix are is not as easy.

The major disadvantage to zip code is the difficulty of addressing areas outside the US. It can be said that adding the telephone country prefix to the area code, we can address the world. I just tried to look up the prefix for Japan. My phone book says to call the operator for that information. I don't even know what the US prefix is so how can I give it out.

If we put an indicator on the front of the address to show the country, then it will be up to the hams there to decide on how they want to address messages. Let's see what a typical address would be:

W-95020

The W indicates the US. We all know and understand the amateur call sign system both for US and for DX. Let's use it. A Canadian address might be VE6K7P1M. Some may argue that this exceeds the present day 6 character maximum limitation on the @BBS field but I am sure that the software experts
we have now can solve this problem
given a few months.

This then is my opinion: a ten character @BBS field consisting of two parts: a country code and (for the US) a zip code. Country codes should be taken from the ITU amateur radio prefix list. Each country would select an internal addressing scheme. For the United States, we would use the postal zip code. The letter “N” would be appended to indicate that the message is NTS traffic.

Feedback

I would appreciate any comments regarding this article suggestions for future articles. Send them to packet: AA4ZRE @ AA4RE, CompuServe: 76064,2107 or USMail: 780 Lisa Court, Gilroy, CA 95020.

TAPR PSK Modem Kit Preliminary Manual Errors

by Lyle Johnson, WA7GXD

I can’t understand it!

There are actually some ERRORS in the TAPR PSK Modem Kit Preliminary Documentation (dated 05 July 1987).

Shucks, a lot of that manual was gathered together and edited at 2 AM. The sun wasn’t even in my eyes!

Presented below is a list of the most blatant, confirmed errors. Please correct your manual to reflect these changes!

Page 2
Change quantity of 0.01 COG capacitors from 10 to 9.
Change quantity of 22k ohm resistors from 02 to 03.

Page 7
The 2-pin header may interfere with mounting the board. You may want to use a wire jumper rather than a push on one here.

Page 14
The two regulator ICs are oriented opposite each other.

Page 18
S2 is upside down.
S2 “pad 2” applies to TNC 1. For TNC 2 use “pad 3.”
“All Switches Front View” refers to the keyway diagram immediately below.

Page 29
UHF Port DIN pins 1 and 3 are swapped. Pin 1 is Common and Pin 3 is Step Down.

Page 36
Pad 2 is for TNC 1.
Pad 3 is for TNC 2.

ADDENDA
Page 3
Replace switch table with the following:

<table>
<thead>
<tr>
<th>Switch</th>
<th>Ref Manual</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmit Mode</td>
<td>S2 JAS/PSK</td>
<td>MAN/PSK</td>
</tr>
<tr>
<td></td>
<td>S3 UP/DOWN</td>
<td>USB/LSB</td>
</tr>
<tr>
<td></td>
<td>S4 PSK/FSK</td>
<td>ON/OFF</td>
</tr>
<tr>
<td>Receive Mode</td>
<td>S1 VHF/UHF</td>
<td>JOINT/ SPLIT</td>
</tr>
</tbody>
</table>

SCHEMATIC

Sheet 1 of 3
J4 - 1 is COMMON.
J4 - 3 is DOWN.
J4 - 5 is UP.

Sheet 2 of 3
No errors reported!

Sheet 3 of 3
See Sheet 2 of 3.

I want to thank the many Amateurs who wrote, called or got onto CompuServe and brought these errors to our attention. The new manual is being compiled and edited as this is written, and everyone who helped point out the errors in the preliminary one will get a courtesy copy.

I am sure there are more errors, but these should be enough corrections to get you on the air with PSK!

Thank you!

Coming Next Issue: A Letters to the Editor column. Be sure to send your comments on PSR, pro or con, to the W3VS at the address listed on the first page. We really do want to hear from you and to share your opinions with the TAPR membership.

Reducing HF RFI from the TAPR TNC 2

by Lyle Johnson, WA7GXD

A number of packeteers have reported interference from their TNC 2s, especially on HF. The problem manifests itself as an unstable, buzzing sort of noise every several kHz throughout the spectrum.

This noise has been investigated and a number of possible solutions proposed. Many of these suggestions have been tried out and this article is a report on the more effective measures.

Even if you haven’t had RFI problems, some of these suggestions may result in dropping your TNC’s current consumption by several mA, perhaps as much as 20 or so! Read on!

FIRST STEPS

Check that all portions of your station are bonded together and grounded with a low-impedance grounding system. This can have dramatic results, and is just good engineering practice.

While doing all this grounding, be sure to electrically connect the TNC 2 case to the case of your radio.

Use a large toroid and wrap the end of your power cable through it for a few turns just as before it enters the TNC 2.

Similarly, wrap your RS-232 cable through a toroid at the TNC end.

A good toroid to use is the MFJ-701. This is an open-frame, square unit that can simply slip over your cable.

INSIDE THE TNC

Add bypass capacitors of 330 or 470 pF from serial port connector J1 to ground at the following pins: 3 (Rx Data), 5 (CTS) and 8 (DCD). This can be conveniently done on the bottom of the PC board.

Replace R1 (47 ohms) with a 10 uH inductor.

Add a 0.01 uF bypass capacitor from -V (negative terminal of C8) to normal TNC ground (C6 and C9 return to a special “B” ground, as shown on the TNC 2 schematic, page 3 of 3).
556 CHARGE PUMP MODS

Cut the trace joining U2 pin 5 to U2 pins 8 and 12 (pins 8 and 12 must still be joined). Add a 10 ohm series resistor from U2 pin 5 to U2 pins 8 and 12. Apparently, the 556 sections turn on simultaneously for a brief period of time, and this is the major cause of the noise heard at HF. The series resistance seems to delay the slave section enough to prevent this from occurring. The resistor value appears to be critical - much more than 10 ohms and the charge pump doesn't work properly, much less and the noise isn't reduced. Thanks to Eric, N7CL, for discovering this characteristic of the charge pump, as well as this cure.

If not already present, add 0.01 uF capacitors from U2 pin to pin 7 and pin to pin 7.

These mods will dramatically reduce RFI and also reduce current consumption by about 10 mA.

ALTERNATE TO 556

As an experiment, I replaced the 556 charge pump with a Siliconix Si7661 CMOS charge pump. Before you plunge in with this mod, be advised that the resulting current drain is about the same as the modified 556, presented above. And, a 7660 charge pump won't work; you must use the Siliconix part, as it is rated to operate at the input voltage range of the TNC 2.

The circuit is that contained in the Siliconix Data Sheet. I simply rewired some of the socket at location U2 and patched in the Si7661. It works fine, but I haven't been able to verify its performance in a side by side test with Eric's 556 mods. If it turns out to be better, I'll supply the details here in PSR. Right now, the 556 mods look to be the best bet. The Si7661 current drain is about the same as the modified 556!

Caveat Emptor!

CONCLUSION

These mods are generally simple and inexpensive to perform. The results are dramatic. If you have experienced any sort of RFI from your TNC 2 on HF, these mods should fix it.

See you on a non-forwarding HF frequency!
TEXNET NEWS!

The Texas Packet Radio Society is very pleased to announce the availability of the TexNet Node Control Processor version 2.1 pc board. We’re offering the pc board at our cost to the amateur radio community for non-commercial uses only. This pc board is the unique and primary hardware component for the TexNet 9600 baud layer 3 network system. The Texas members of TPRS will be installing this version of the board in TexNet nodes throughout the state. We have been operating 4 nodes on the air since October, 1986 using the same circuitry as this version 2.1.

Other groups and individuals who desire to install a layer 3, 9600 baud network system can order the pc board and documentation, and an EPROM set containing he system image software by mail. Order information is listed below.

The TexNet node is a stand-alone, totally pre-programmed-in-EPROM system. It is designed to be installed in remote tower locations. There are no user programmable parameters necessary to operate the network nodes. Nobody wants to climb a tower in the dark to replace a dead lithium battery! A local terminal connection to the node is not necessary. The design is of a fail-safe oriented system. A UPS allows the node to operate independently of AC mains for a limited period of about an hour. If the system batteries fail before AC power is restored, all operations return intact after power is restored. If the node software fails thru a fault due to a power circuit glitch (like a near lightning strike!), the node can be forced into a hardware reset via the network link. The only requirement for network link resets is that the network link radio still work and the modem section of the PC board still be operational. A TexNet node will automatically re-build its routing table after power-on system reset.

The system components that are available include:

A> Node Control Processor version 2.1 pc board.

This NCP printed circuit board is offered without parts, it has been silkscreened and soldermasked with plated holes. It has the circuitry traces for a discrete CPU oscillator circuit, Z-80A CPU, 40K of static RAM (84256 & 6264), 24K EPROM (system software, 27C256), 2 Z-80A SIO-0’s for three synchronous radio ports and one async terminal port, one 9600/4800 baud modem with state machine (2716 EPROM), one 1200 baud modem with state machine (2716 EPROM), a Z-80A CTC, network trunk hardware reset circuitry (2732 EPROM), modem connector pads and five control points.

Use of the third sync port requires the addition of another modem. Please note that each port can be strapped for 1200, 2400, 4800 or 9600 baud operation. From what we know of the system loading tests, the node can effectively support one 9600 baud network port and a number of slower speed user ports. The other two ports can be a combination of the other three speeds, 1200, 2400 or 4800 and can support either user or network connections.

We will NOT be offering a set of parts. All parts used are standard logic family parts, Z-80A, 74HC-mos, 74LS, and CMOS static rams and EPROMs. Included with the pc board is documentation to assemble the board, tune the modem sections and interface the NCP modems to the RCA series 700 UHF transceiver and the 2m FM transceiver.

B> An EPROM set containing:

1) an un-coordinated network system software image (27256)
2) state machine image (2716), this is for both the 9600 and 1200 baudmodems.
3) reset logic image (2732)
4) documentation that describes procedures for: coordinating network nodes, programming node features, nodenames, node numbers, Packet Message Server routing, timing parameters, system digi- peater access limits, aliases, connection responses, hardware reset programming pro- cedure and greeting banners and prompts.

The EPROM set purchased by a system installer is registered with TPRS and support is granted only to registered system installers. System installers who have purchased the registered EPROM sets from TPRS receive update information. Included with the purchase is a license to make as many copies and coordinate as many nodes as is necessary for their system. Again, the constraint is this: the system must be installed and used non-commercially in an amateur radio operated and owned packet network system.

PLEASE NOTE!! This is NOT source code. The code in the EPROM kit requires a central coordination effort by a group or club. To successfully use the TexNet system software requires the facilities of a personal computer equipped with an EPROM programmer, disk file utilities to read and edit EPROM images. Then software to program the coordinated EPROMs.

C> A daughter pc board containing circuitry for the Packet Message Server interface and 8 more control points. This board uses a Z-80A PIO, a 74L5244, a 74LS245 and a 74LS138 as an address decoder. It plugs into the Z-80 socket and the Z-80 is placed on the daughter board. This separate pc board comes with separate documentation.

Prices—

NCP version 2.1 pc board—$44 plus $4.00 shipping & insurance

Interface daughter board—$10 includes shipping

EPROM set & documents—$50 plus $4.00 shipping and insurance

These prices are subject to change. Shipping and insurance is First Class and insured for $50 via U.S. Mail. No UPS. Cashier’s check, money order, or certified check made out to TPRS are all acceptable forms of payment. Personal checks will delay filling your order until they clear. To avoid undue delay, please order via the PO Box listed below, do not use the membership P.O. Box number on the newsletter. Allow 6 to 8 weeks for delivery.

TPRS
P.O. Box 835138
Richardson, Texas 75083-5136

The Texas Packet Radio Society, Inc. is a non-profit charitable organization incorporated in the state of Texas. These printed circuit boards and software are offered only for use in other non-commercial, amateur radio owned and operated packet switching communica-
tions network systems. The buyers of
the printed circuit boards and software
are thereby notified that the system's
performance is dependent on the as-
sembly and installation expertise of the
buyer and or installer and is therefore an
experimental system and is offered "AS
IS". No license for commercial use is
implied or granted through purchase of
any of the system components.

System Support

The Texas Packet Radio Society will be
publishing notices of updates, modifica-
tions, or TextNet related components
through the TPRS Quarterly Report. A
subscription is $12 per year for at least
four issues annually, some supplemental
mailouts are made irregularly. Please address your subscriptions to
the address listed below:

TPRS
P.O. Box 831566
Richardson, Texas 75083-1566

NET/ROM version 1.1
released 10 July 1987

Version 1.1 incorporates no new fea-
tures, but corrects three relatively minor
problems that were found in version 1.0.
We do not feel that it is necessary to
update nodes presently running 1.0, ex-
cept for the relatively few places where
one or more of these problems are
causing significant difficulty.

Following is a description of the three
problems fixed in 1.1:

(1) Destination table entry counter:

When a destination node is deleted
from the routing table (either manually
or by the automatic obsolescence
mechanism), the destination
list entry is not deallocated immedi-
ately, but rather just marked as a
deleted destination entry available
for re-use. However, such deleted
entries are deallocated when the
node is warm-started (for example,
if there is a power failure, or if the
SYSOP issues a RESET). Version
1.0 has a "bug" whereby the desti-
nation table entry counter is not de-
cremented when entries are deallo-
cated during a warm-start. This can
cause the count to become incor-
correct (too large). The count is used
to limit the size of the destination
table in accordance with PARMS
parameter #1. Consequently, the
"bug" can result in premature
"Routing table full" messages, or
failure to incorporate new nodes
from a neighbor node's routing
broadcast. WORKAROUND: this
problem can be avoided either by
(1) not warm-starting the node, or
(2) setting the PARMS parameter
#1 to a high value.

(2) RNR during deferred disconnect

When two stations are connected
via NET/ROM and one of them
disconnects, NET/ROM's "de-
ferred disconnect" logic causes any
in-transit information frames to be
delivered to the still-connected
station until all such frames have
been delivered or until a given pe-
tiod of time elapses (by default, 15
minutes) with no forward progress.

Version 1.0 has a "bug" that causes
this protective timeout to be inef-
fective if the connected station's TNC
is refusing the information by re-
turning a RNR status.

(3) Fast-learn of paths with two digi-
peats

NET/ROM incorporates new nodes
into its routing table by monitoring
the source callsign field in the layer
3 header. Version 1.0 has a "bug"
whereby layer 3 frames that arrive
via two digipeats cause a routing
table entry to be constructed with the
digipeater list in reverse order.

Version 1.1 fixes this problem, and
checks for the existence of the
entire path, not just the source callsign.

Clearly, these are rather esoteric prob-
lems, and have not caused significant
operational problems. We do not feel
that any wholesale updating of 1.0
nodes to 1.1 is warranted.

NET/ROM version 1.2
released 14 August
1987

Version 1.2 adds two important new
features to the automatic routing sys-
tem. There are no incompatibilities
between version 1.2 and prior versions
of NET/ROM. However, the new fea-
tures in version 1.2 are significant
enough that operators of nodas using
prior versions may wish to consider
upgrading to the latest firmware.

A new command, ROUTES, allows
node control operators to fine-tune the
automatic routing system by assigning
explicit path quality values for individual
neighbor nodes. (In prior versions, only
a global channel quality value could be
assigned by the control operator, and
that value was assumed to apply univer-
sally to all neighbors on the channel.)

A detailed description of the ROUTES
command follows this summary.

NET/ROM's automatic routing algo-
rithm has also been enhanced to pre-
vent a node from getting stuck using a
sub-optimal path for long periods of
time. The enhancement is most easily
explained by giving a specific example:

Suppose user X wants to connect to
user Y. He uplinks to his local node A,
requests a circuit to destination node D,
and then downlinks to user Y. Node B
has two alternate routes to D...via node
C via node E. The route through node
C has higher quality than the route
through node E. NET/ROM prefers to
use the optimum route through C; how-
ever, if that route fails for some reason,
it will use the alternative route through E.

In versions of NET/ROM prior to 1.2,
Net/ROM's "de-
nected" logic causes any
in-transit information frames to be
delivered to the still-connected
station until all such frames have
been delivered or until a given pe-
tiod of time elapses (by default, 15
minutes) with no forward progress.

Version 1.0 has a "bug" that causes
this protective timeout to be inef-
fective if the connected station's TNC
is refusing the information by re-
turning a RNR status.

In versions of NET/ROM prior to 1.2,
one B starts routing D-trafficthrough E,
it will not even attempt to try the path
trough C again until the crosslink be-
tween B and E is deactivated...which
happens when there has been no traffic
on the crosslink for (nominal) 15 min-
utes. In high-traffic areas, however,
such a period of no activity might not
happen for hours or even days! Thus,
node B would become "stuck" using a
sub-optimal route for long periods of
time.

In version 1.2, the following enhance-
ment has been made. When node B
receives a routing broadcast from node
C (typically once each hour), it takes a
look at all destinations whose optimum
(highest-quality) route is through node
C. (In this case, node D is such a desti-
nation.) If node B discovers that it is
using some other (sub-optimal) route
to one of these destinations, it deactivates
the sub-optimal route and tries the opti-
mal route (through C) once again. Natu-
really, if the optimal route fails for any
reason, it will try alternative routes in
descending order of quality, as usual.

The following addition has been made
to the NET/ROM manual (following
The ROUTES command is used to display or modify the neighbor list of the node’s routing table. To display the node’s neighbor list, use ROUTES without any parameters:

```
ROUTES
```

For each neighbor list entry, the following items are displayed in sequence:

- **-** if an active crosslink exists to this neighbor
- port number (0=HDLC port, 1=RS232 port)
- path to this neighbor (callsign + any digipeaters)
- path quality to this neighbor (255 is best, 0 is worst)
- use count (number of routes via this neighbor)
- **+** if this neighbor list entry is locked
- **!** if this neighbor list entry is deleted

To display this information for just one particular neighbor list entry, use ROUTES followed by the port number and path:

```
ROUTES port nodecall [digicall...]
```

The ROUTES command supports manual modifications to neighbor list entries. For each neighbor list entry specified by the port, nodecall, and digicall parameters, and sets the path quality of that entry to the value pathquality (255 is best, 0 is worst). If there is no entry in the neighbor list that matches port, nodecall, and digicall, a new entry is created, locked, and initialized with the specified pathquality and a use count of zero.

The **+** version locks the neighbor list entry specified by the port, nodecall, and digicall parameters, and sets the path quality of that entry to the value pathquality (255 is best, 0 is worst). If there is no entry in the neighbor list that matches port, nodecall, and digicall, a new entry is created, locked, and initialized with the specified pathquality and a use count of zero.

The **!** version unlocks the specified neighbor list entry. If its use count is zero, the entry is deleted immediately. Otherwise, the entry remains in the neighbor list and its path quality is set to the value pathquality. If the use count of an unlocked neighbor list entry ever becomes zero, the entry is deleted.

The path quality for a neighbor is used by NET/ROM in its calculations of route qualities for all routes through that neighbor. By modifying the path quality using the ROUTES+ command, the control operator can encourage or discourage a node from using paths through a particular neighbor. By setting a neighbor’s path quality to zero, the control operator can cause the node to ignore the existence of that neighbor altogether, even to the extent of disregarding the neighbor’s routing broadcasts.

The delays in getting out the COSI-Switch have been long and somewhat frustrating for everyone. Things are finally coming together.

What should be clear to everyone by now is that the originally announced X.25 Level 3 code has not arrived.

Something had to be done...

The project has been started from scratch by Tom Moulton, W2VY. He is getting consultation support from John Howell, N2FVN, Harlan Worchel, KB2CNL, and Gordon Beattie, N2DSY. All of these individuals have previously implemented X.25 switches or Packet Assembler/Disassemblers (PADs). We had a design review on the 14th of August and we are all quite pleased with the progress Tom has made. (Kudos to Tom!)

The revised delivery schedule is as follows:

- Oct - Alpha testing of a completed COSI-Switch Level 3 module
- Nov - Beta testing of a completed COSI-Switch machine - TNC-2/DR-200 (Any other hardware suggestions?)
- Jan - Production shipment begins

All individuals and clubs that contacted RATS regarding this project will receive MS-DOS Disks and EPROMS with the code during each phase of the testing cycle. We got a good deal on diskettes and EPROMS so we will include everyone! The production version will include SOURCE in “C”.

As with all the SOURCE we distribute, it is free for non-commercial use.

Support contributions are accepted and commercial licensing arrangements can be made. Contact RATS for details. ALL proceeds go to the enhancement of the Packet Network.

The Radio Amateur
Telecommunications Society
Information Bulletin
20 August 1987

To: All Radio Amateurs
Fm: N2DSY @ KD6TH-4/201
Sb: COSI-Switch and RATS Update

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Other happenings:

John Howell N2FVN has produced an implementation of the “Asynchronous Framing Technique (AFT)” in “C”. This is useful for providing error-checked, transparent HDLC links through asynchronous interfaces. AFT can be run over seven or eight bit networks and handles HDLC frames transparently. It is a nice building-block for the network.

This AFT is a generic implementation (accompanied by a “DOC” file) that includes code that runs under MS-DOS. Distribution of this code, in compressed form, will be via Amateur Packet Radio, Usenet and Compuserve HAMNET. The file name(s) will be based on the string “AFT10” for AFT Version 1.0. It will be distributed in compressed form. We’ll send it out with the first COSI-Switch test code.

John is working on a matching capability for the TNC-2. This would provide an error-checked link between PCs and

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John is working on a matching capability for the TNC-2. This would provide an error-checked link between PCs and
TNCs. Harlan Worchel, KB2CNL (yes, a NOVICE) is working on porting the code to the Commodore 64.

Brian Riley’s (KA2BQE) latest release of the Packet Radio Mailbox System, version 95c, supports forwarding through COSI-Switch, GatorSwitch and NET/ROM. It also has the “KT” (kill traffic) feature that will automatically generate a service message when a traffic message is removed from the packet network. It is available from RATS, with the "C" SOURCE CODE. Send a message to N2DSY @ KDSTH-4/201 or KA2BQE @ KA2BQE-4/609 to get a copy of the code.

RATS is currently beta-testing the GLB Natlink 220 19.2 Kbps modem/radios. So fast ! Sooo good ! We are also burning-in eight PAC-COMM DR-200s. These will be deployed shortly.

RATS wishes to thank you for your patience. We’re not real happy with how we got into the Level 3 COSI-Switch delay, but we think the effort is on the right track. If you have any questions call or send me a message.

Hang tough. We think you’ll like the output!

Next update will be sent on or about 15 September.

VY 73,
J. Gordon Beattie, Jr.

MAIL
Unix: ihnp4lhouxmhou2dln2dsy
Amateur: n2dsy @ kd6th-4/201

TELEPHONE
Office: 201-615-2506
Home: 201-387-8896

---

**NNC Project Update**

by Dr. David Toth, VE3GYQ

It has been quite a while since members were brought up to date regarding the NNC (Network Node Controller). I think a brief recap of the project is in order.

It became obvious to many people that the packet revolution had arrived, and that we might become victims of our own success. What I mean is that we were likely to see packet fall apart because it was so popular. With the increase in activity, it was obvious that we needed two big things to build the network successfully:

1) HIGH SPEED RADIO MODEMS.

2) A DEVICE TO ROUTE PACKETS AROUND OUR MYSTICAL (MYTHICAL) NETWORK.

Where are we as of this moment in 1987? Well, we have 56 kilobaud modems. Everyone won’t need one, but some of the bearded wonders (do Phil Karn and Bob McGwier have beards? Nawwww! oh well!) are reproducing the modem designed in Georgia, and you will be hearing big things about it soon.

That brings us back to the NNC. Well, Jay Nugent WB6TKL and his squad in Michigan (including N8BJX and WA1LRL) have got the SCSI interface working and talking to a hard drive. They also gave us a communications program, and that brought us the next major breakthrough. Bob McGwier, NN4HY, has been porting the TCP/IP code over to the NNC and we hope to have something to test by the end of October. Our major stumbling block is the C compiler that Bob has to use. It was designed for a Z80, and is limited to the 64k architecture of that chip. The 64180 of the NNC can address more memory, so Bob is hand-patching the assembly code produced by his C compiler so that he can work with the larger memory.

So, if anyone has a lead on a cheap, and good, C compiler for the 64180 that does not use overlays, but indeed does support the 64180 completely, we would love to hear about it.

Bob feels that this can all be married with NET/ROM feeder links so that we can interface to existing parts of the network. Howie is talking with Phil Karn and Bob as to what can be accomplished with a melding of the Virtual Circuit technology with the Datagram stuff of TCP/IP and NET/ROM.

I think that we can safely say that we are beyond the days of squabbles as to whether datagrams are better than virtual circuits, etc. If one looks at the commercial world, one sees a happy smattering of both, and they co-exist. After talking to Howie, Phil, and Bob, I am assured by them that such will be the case in the amateur network.

And while I am discussing the network, I should advise you that the various BBS programs written by WORLI/VE3GYQ, WA7MBL, and KA2BQE are all being modified (constantly) to integrate them into an enhanced network.

I am presently meeting with Chris Sullivan VE3NRT, who has extensive network design experience, in order to design a specification for the next generation of BBSs. This specification will be presented to the software types for scrutiny and criticism/comments.

So, if there is one message that I can leave you with, it is to go out and line up RF sites so that we can press onward with establishing connectivity. Dust off your copies of Tanenbaum’s "Computer Networks" and see what constructive comments you can add.

73,
David B. Toth, M.D. VE3GYQ
NNC Project Manager

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**New WA8DED Firmware Available**

Ron Raikes, WA8DED, recently uploaded the following new versions of his popular TNC firmware to the CompuServe HamNet DL9 Data Library.

**TNC1FW.ARC: version 1.3 user firmware for the TAPR TNC-1 and clones.** This version adds a full duplex command and a patchable location for 8-bit character sets in terminal mode.

**TNC2FW.ARC: version 2.1 user firmware for the TAPR TNC-2 and clones.** This version adds a full duplex command and a patchable location for 8-bit character sets in terminal mode. DWAIT channel arbitration has been replaced by P-persistence.

**PK87FW.ARC: version 2.1 user firmware for the AEA PK-87. Changes are identical to those in TNC2FW.ARC.**

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**Support TAPR! Renew Your Membership!**

With *Packet Radio Magazine* no longer publishing, *PSR* is the only dedicated source of packet radio-related material. And *PSR* is only available as part of your membership in TAPR. Please check your membership expiration date (on the mailing label for this issue) and, if it’s 7/87 or earlier, please RENEW! Use the membership renewal form on the back page.

Keep PSRoming to you! TAPR thanks you for your support!
null
USA-PEBS.09A
Revised 18 September 1987
By EYHSC

The following is a list of Pocket Digipeaters and Pocket Antenna Boards reported to be in use on the
Packet Radio in the United States. Only these
Digipeaters which are operational 24-hours a day,
are those whom we have purchased a copy of
SKIPMAN, and those PBB's which use
WRL1/WRL2/BRAGPA. Part Five (Digipeaters)
listed below. A digipeater may be a personal station or a dedicated TRANCE station 24 hours a day, 365 days a year.

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For a complete list of Pocket Antenna Boards and Digipeaters, refer to the respective sections of this manual.
Please let me know of any corrections, deletions, additions or verifications to this file. Send them to me - K4NGC via one of the Packet Radio PBBS mailboxes. If you publish or maintain a Digipeater/PBBS listing, please forward a copy of the same to me so that they may be added to this list. Insure that the station you are correcting is marked Digipeater or PBBS. This list will be purged if the update date exceeds 2 years, therefore verification is necessary. The Master list contains over 1000 callsigns, of which 55% are digipeaters and 45% are PBBS's. Please do not forward eaps or listings which do not indicate if the station is a user, digipeater or PBBS.

73's, Don Bennett - K4NGC
15016 Carlsbad Road
Woodbridge, VA 22193
(Home) 703-670-4773
(Office) 703-274-9355/56
(ANRAD BBS) 703-734-1387
(MAPNET: dbennet@diecast)
(CoapuServe) 7210, 263

TONIO
01 September 1987

To: All TAPR Members
Fr: Lyle Johnson, President
Re: PSR

Last September, Packet Status Register (PSR), the TAPR newsletter, merged with Packet Radio Magazine (PRM). This resulted in your receiving up-to-date packet radio information on a monthly basis.

By February of this year, PRM was in serious trouble. Gwyn Reedy, W1BEL, Editor of PRM, lost the valuable assistance of Brad Voss, and was unable to secure additional volunteer help to continue the publication. Feeling the responsibility of continuing the magazine while he searched for help, Gwyn attempted to continue the effort virtually single handedly.

Unfortunately, the combined workload of editing PRM, continuing an active role in TAPR and FADCA, and the growing pains of his company (which he also “inherited” when he and his partner parted ways), proved to be too much. After getting the March and April issues of PRM out, Gwyn realized he was unable to do everything and still do a good job. Thus, reluctantly, he has stepped down from his directorship of TAPR, the Presidency of FADCA and ceased editing PRM. This decision occurred in late July.

Of course, this meant that TAPR had to locate an editor for, and attempt to revive, PSR.

I am happy to report that we have been successful in this effort. Effective immediately, Scott Loftesness, W3VS, TAPR Director and CompuServe’s HAMNET Chief Sysop, has agreed to edit PSR for us. Scott is well qualified for this volunteer post, and we are grateful for his willingness to serve the TAPR membership in this way.

Scott desires that PSR be a meaningful publication for packet radio, and this means that he needs technical and operational articles. Please assist us in bringing a quality publication to you by submitting material to him. Material may be sent to the TAPR office at the address indicated on this letterhead, or submitted directly to Scott via CompuServe (upload on the DL7 database), or you may mail information to him at:

Scott Loftesness, W3VS
Editor, PSR
16440 Rustling Oak Court,
Morgan Hill, CA 95037.

The “July” cover-date issue is being assembled now, so any submissions you make will be for the next issue.

A final note. TAPR dues were raised last year from $12 to $15, partly to cover the additional expense of providing PRM. Since the dues were set in 1981, this has been the only increase. Providing the office, supporting packet development, and general costs to maintain the organization have resulted in costs greatly in excess of those anticipated 6 years ago. Therefore, the dues structure will remain as it currently is.

Thank you for your patience with us during this time of turmoil, and please join me in welcoming Scott as your new PSR Editor.

Happy Packeting!

Lyle Johnson, WA7GXD
President
MEMBERSHIP APPLICATION

Tucson Amateur Packet Radio Corporation
PO Box 22888, Tucson, AZ 85734

Name: ________________________________

Call License
Sign: __________________ Class: __________________

Address: ________________________________

City & ZIP
State: __________________ Code: ______

Home Phone: ______ Work Phone: ______

If you wish to have any of the above information deleted from publication in a membership list, please indicate which items you wish suppressed:

I hereby apply for membership in TAPR. I enclose $15.00 dues for one year's membership dues.

Signature: __________________ Date: ______

The Tucson Amateur Packet Radio Corporation is a non-profit, scientific research and development corporation. TAPR is chartered in the State of Arizona for the purpose of designing and developing new systems for packet radio communication in the Amateur Radio Service, and for freely disseminating information required during and obtained from such research.

The officers of the Tucson Amateur Packet Radio Corporation are:

Lyle Johnson, WA7GXD President
Tom Clark, W3IWI Executive Vice President
Dianne Marshall, AL7FG Secretary
Terry Price, N6HBB Treasurer

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Packet Status Register Editor
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Packet Status Register - July 1987

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