# DIGITAL Journal

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# DIGITAL Journal

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# Hardware Review

*by Dale Sinner, W6IWO*
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## AEA FAX III Modem

Many of us are familiar with FAX messages. We see them daily, periodically or seldom. But, you probably have not seen FAX over HF radio. Did you know weather maps and global pictures are transmitted almost continuously from around the world? Your local weatherman is quite familiar with these maps often displaying some during his weather report segment. He does, however, obtain his weather forecasts from a different source than what I'm proposing here. Most likely his reports come from a commercial satellite other than those we will be encountering.

I've been wanting to try out a HF FAX modem for some time now. But, there were a couple of drawbacks I needed to first overcome. I really needed a 256 color monitor and better video board in the computer in order to obtain the proper resolution. Since I also have many devices in this computer it would also be necessary to upgrade to a faster I/O board and more COM ports. Once these hurdles were overcome, I was ready for the AEA FAX III modem (almost had to buy another machine). However, let me say here that it was my choice to upgrade my computer. It is not necessary to have all the bells and whistles to run this modem and it's software. All that is needed is an IBM PC, XT, or AT compatible with 2.5 meg of free space on the hard drive and a VGA, CGA, EGA, or Hercules quality monitor. Even a mouse and printer are not required.

**Out of the Box**

The first thing I did upon receiving the AEA FAX III modem package was read the manual. The manual explains the features of the unit and spends many pages explaining how a FAX transmission works. I found it invaluable when I was ready to receive a FAX transmission. The AEA FAX III is the latest version and has more features than previous versions. FAX is not the only mode this unit is capable of receiving. In addition, Morse Code, NAVTEX and RTTY modes are also featured. New to this unit is the ability to select user definable 256 color palettes when viewing FAX pictures at VGA resolutions. It also supports computer control of many ICOM, Lowe, Yaesu and Kenwood radio receivers, making picture reception available automatically.

The package included the unit, manual and software. The unit plugs into any serial port and can be in line with another device as long as both devices are not running at the same time. The software is a DOS program and a simple command of "install" will have you up and running in a matter of minutes. In fact, there is even a "Quick Start" chapter up front for those in a hurry. But, I do strongly recommend you read the manual. All to often we have a tendency to call the manufacturer for an answer that we could have found in the manual if only we had looked. Save yourself a phone call and the aggravation that goes with it, read the manual!

Once the modem and software have been installed you are ready to receive the mode of your choice. Simply plug the extended cable into the audio port of your radio and tune in a signal. If you wish to control your radio with the software, then there are a few other parameters you will need to set up first. But, if you are like me and in a hurry to try out this baby, you'll tune in a signal first. In this article I'll focus on FAX reception only. Most of us are already familiar with CW, RTTY and NAVTEX. So FAX tuning will be the hardest to learn.

Now you are probably wondering where to find a FAX frequency? That's easy, AEA has thought this out very carefully and you will find suggested frequencies listed in the manual. Both national and international frequencies are listed along with time slots. Also listed are NAVTEX stations that transmit on 518 khz. Satellite frequencies and schedules have also been included. I'm told other frequencies can be found on the Ham Net of Internet. To start off, I suggest you find the strongest signal you can for your area.

Now that you have selected a frequency, you may be wondering how to tune a signal. AEA has taken the guess work out of this and provid-

*(cont'd on page 30)*

# Digital Images for Digital Mode Communications

**Part - 2**

*by Paul Richter, W4ZB*

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The first article in this series discussed the basics for digital images, explaining how the image "information" needed to control computer display hardware could be stored in binary raster (bitmap) or vector files. The basic concepts of image file compression were introduced. In this Part II, we expand on the important ideas of digital image and file compression. We then describe the characteristics of several of the most common digital file formats in current use. We also discuss basic image manipulation software types, how to get digital images into computer files, and how to use the information already provided to select optimal file formats to reduce digital image file sizes, with specific examples.

**More on File Size and Digital Image Compression**

Most readers who have computers are already familiar with file or data compressors. Many have used PKZIP and PKUNZIP or other similar programs to compress and uncompress computer files.

Two of the most popular computer file compression programs in use today are PKZIP and ARJ, each of which is widely available. Each of these file compressors use variants of the so-called LZW (Liv Zempel Welsh) compression algorithm - and have the important characteristic of being "lossless" file compressors. This means that no information contained in a file is "lost" upon compression, but instead, the information in the compressed form of the file can be uncompressed back into the exact original file. Use of "lossless" file compression is crucial for many types of computer files because the changing (or loss) of even a single bit in a file will result in failures or errors during computer operation.

So called "lossy" compression, however, may be usefully employed with certain types of computer files. For example, consider a standard VGA display image which consists of 307,200 separately addressable pixels of digital image information. What happens if some of the pixel values for a particular image are changed? Of course, the image itself will change, but what if the pixels to be changed are selected so that the human viewer can barely (or not at all) perceive the change through his eyes? In fact, lossy compression techniques which take advantage of the characteristics of human vision have been developed to effectively compress certain types of digital images.

The technical details of how these various lossless and lossy compression techniques work are complex and beyond the scope of this series. Those interested in more details should download the current version of the digital compression FAQ (Frequently Asked Questions) file which is at the IDRA's FTP Internet site.

**Descriptions of several common digital image file formats**

In this section we identify and describe the basic characteristics of a number of popular digital image file formats. The particular file formats are identified by their common DOS filename extensions.

GIF - Graphics Interchange Format. Several versions. The GIF format was developed by CompuServe as a raster or bitmapped binary file format to facilitate the exchange of computer graphics. GIF is suitable for B&W, grayscale or color palette with palette sizes controllable up to 8-bit (i.e. 256) colors (or grayscale levels). It uses a variant of LZW "lossless" compression. The GIF format is particularly good for computer or drawing art and is currently the most popular digital image format in use on the WWW. The GIF format is usually not as effective as the JPG format for compressing images of "natural" scenes (e.g. photographic images). Because GIF files are already compressed using a variant of the LZW lossless compression algorithm, efforts to further compress such files using PKZIP, ARJ or the like are unavailing.

JPG - The Joint Photographic Experts Group (JPEG) standard. This is an international standard for encoding digital bitmap images into binary files. The JPG format is used to reduce a digital image binary file size while retaining an "acceptable" appearance for the displayed digital image according to subjective criteria controlled by the user. Software for creating digital images in the JPG format usually offers many options so that the user may "experiment" until obtaining an "acceptable" tradeoff between digital image file size and displayed image appearance. JPG implementations employ predetermined "lossy" compression techniques so that actual digital image "information" loss occurs as greater compression is used (i.e. as file sizes are further reduced). The JPEG "lossy" compression techniques were selected to minimize the perceptual loss of image quality as viewed by an average human observer. The JPG format is not effective for use with pure B&W images, but is useful with grayscale and color images. And it is particularly effective with images of "natural" scenes. JPG is usually not as effective as the GIF format with computer drawing art. Because JPG files are already highly compressed, efforts to further compress such files using PKZIP, ARJ or the like are unavailing.

TIF - Tag Image File Format. TIF is a very widely supported, older standard for bitmap binary image files. The standard exists in many variations and accommodates B&W, grayscale and color, including to 24-bit and 32-bit color depth. TIF format files are characterized by very large file sizes compared to other compressed digital image formats. PKZIP and ARJ lossless file compressors are effective to greatly reduce uncompressed TIF file sizes, often by 20:1 or higher ratios.

BMP - Bitmap File Format. BMP is a Microsoft standard for bitmap binary image files originally developed for Windows. The BMP format accommodates B&W, grayscale and color to 24-bit color depth. BMP format files are characterized by large file sizes compared to other compressed digital image

formats. PKZIP and ARJ lossless file compressors are effective to greatly reduce uncompressed BMP file sizes, often by 20:1 or higher ratios.

CMP - Compressed File Format. This is a proprietary binary bitmap file format of Lead Technologies which is claimed to be superior to the JPG format for use in instances in which JPG would otherwise be the preferred file format. This includes situations involving images of "natural" scenes as distinct from computer drawing or computer art images. EXPRESS Ver. 3.5 with Clover uses the CMP format digital image files to automatically exchange pictures of the operators.

CDR - Corel Drawing Format. This is a proprietary binary drawing file format which is controlled by the publisher of Corel Draw. The CDR format can include both bitmap and vector graphics information which changes with revision levels of Corel Draw. Because of the popularity of Corel Draw, many non-Corel file readers and converters are available for CDR format files.

DWG - Drawing File Format. This is a proprietary binary drawing file format which is controlled by Autodesk, the publisher of the AutoCad CAD (computer aided drawing) programs. The DWG format is a vector graphics format which changes with revision levels of AutoCad. Because of the popularity or dominance of AutoCad in the CAD field, many non-Autodesk file readers and converters are available for DWG format files.

DXF - Drawing Exchange File Format. This is a proprietary file format which is controlled by Autodesk, the publisher of AutoCad. DXF format files are text files which contain vector graphics information in text form corresponding to AutoCad DWG files, and may be converted to or from DWG files (or other application CAD file formats). An important aspect of a DXF file is that the "vector" information in a DXF file may be manually edited with a text editor to control the content of corresponding DWG files and the CAD image displayed. The DXF format, like the DWG format, changes with revision levels of AutoCad. Because of the popularity or dominance of AutoCad in the CAD drawing field, many non-Autodesk file readers and converters are available for DXF format files.

**Image Display, Capture, Editing and Conversion Software**.

Before continuing, I want to digress briefly to mention a number of the current software packages which can be used easily for image display, capture, editing, touch up and conversion. Some of the higher end (i.e. more expensive) commercial packages mentioned contain all of these basic features in a single package. Others which will be mentioned are available as shareware. Many other commercial and shareware packages are available as which run under DOS and Windows. This list is not at all exhaustive, but is based upon the writer's experience. More specifics about these program packages and their features will be discussed in the next article in this series.

Hijaak Pro and Corel Draw are commercial packages each of which includes the full range of features mentioned. Fauve Matisse is a commercial package which is primarily a drawing, editing and image touch up program. PaintShop Pro is a shareware package comparable to Fauve Matisse. AutoCad is an expensive CAD drawing program which is very popular for commercial CAD. Visio is a commercial drawing program which uses predefined and user defined shapes. LView Pro is an excellent shareware program for Windows for viewing, editing and file conversion. (A copy of LView Pro has been posted at IDRA's FTP site for downloading and is highly recommended for those who wish to experiment with image editing and conversion. EXPRESS Ver. 3.5 by Peter Schulze, TY1PS, includes an image editor.

**How Do You Get a Digital Image into a Computer File?**

There are several basic ways to get a desired image into a file apart from having someone give you a computer file with an image already in the file. More specifics on each of the following methods will be discussed in the next article in this series.

Image capture of a computer screen image is one of the simplest ways to get an image into a computer file. This requires the user to have screen or image capture software and also to have the ability to form a desired image on his computer screen. The desired image is typically taken from the graphics output of another application being run by the user. Many DOS and Windows screen capture programs are available.

A new and original digital image can, of course, be created using a drawing editor or program. Virtually all modern, sophisticated drawing programs (e.g. Corel Draw, AutoCad, Visio, Hijaak Draw, Fauve Matisse, PaintShop Pro) draw with program specific "objects" using a native "vector" format. Most can also produce raster or bitmap image files.

A document scanner permits the user to scan in a image from a document to a computer file. Depending on the capabilities of the scanner and the associated software, the document can be a photograph and image can be in color.

Digital color image cameras for under $500 are now widely available. These new cameras are suitable for taking and producing pictures to be displayed on computer monitors. A picture taken with such a camera can be downloaded from the camera to a computer.

Television frame capture devices can be used to capture still frames from a television transmission or from a recorded VCR tape. A commercial product known as SNAPPY is highly recommended for this use.

**What Do You Do After You Get the Digital Image Into A Computer File?**

After the desired image is obtained in a computer file, the user often wishes to modify, touch up, edit, annotate or otherwise change the image. This is almost always the case when the user has captured or scanned in the image from another source. To accomplish this, the user needs a suitable drawing or editing program. Many such programs running under Windows and DOS are available, and several have been mentioned above.

After the image has been modified to its desired final form, the user next needs to determine the optimal format for the digital image file. As mentioned earlier, the optimal format will depend upon several factors, but most importantly, upon the type and source of the image. To select a final format, the

type and source of the image. To select a final format, the user will need image conversion software and be willing to engage in some experimentation with different format conversion parameters.

Usually, the user will have several choices for the optimal formats, and the final choice will depend upon several factors, including subjective considerations for the user. If the user is planning to exchange the digital image file over a digital communications link, he needs to select a "common" format which his counterpart will have so that the digital image may be viewed by the recipient without difficulties. The user may also have a file size constraint (e.g. the final file size must be less than 10K bytes) which will place limits on attainable image display "quality". In converting a digital image file to meet a file size constraint, the user's conversion software will typically provide options to reduce the color or grayscale levels, the physical size of the displayed image, and other image "quality" parameters.

Experimentation will be required until the user achieves a trade off which meets his requirements in an acceptable manner.

Fig. 1

**Examples of selection of optimal file formats to reduce file sizes**

Corel Draw Ver. 4.0 includes as a sample computer art file, an 8-bit color depth per pixel (i.e. 256 color) drawing of stylized "dragonfly" in TIF format. See Fig. 1. To demonstrate the differences between file formats, I converted the original TIF file into three other formats (JPG, CMP and GIF) using the HiJaak Pro software for the conversions, without color reduction or other "visible" changes between in the respective displayed images in each different format. The sizes (in bytes) for these files are as follows: original TIF - 86922, JPG - 19135, CMP - 19705 and GIF - 4992.

The size of the GIF format file in this instance is less than 6% of the original TIF format file. The JPG and CMP format files, on the other hand, were about 22% of the size of the original TIF file. These results are not surprising considering that the original TIF file was a computer drawn art file. As a further experiment, I then compressed the original TIF file using the PKZIP and the ARJ file compressors. The sizes (in bytes) files of the original 86922 byte TIF file were: ZIP—4174 and ARJ—4072. Each of these lossless compressed files is less than 5% of the size of the original TIF file, and the exact original TIF file can be obtained from the compressed versions by reversing the lossless compression process with PKUNZIP or ARJ.

Fauve Matisse Ver. 1.1 includes as a sample image file, an 8-bit grayscale of a portrait photograph of a woman in JPG format. See Fig. 2. To demonstrate the differences between digital image file formats, I converted this original JPG file into two other formats (CMP and GIF). Again, I used the HiJaak Pro software for the conversions, without color or grayscale reduction or other "visible" changes between in the respective displayed images in each different format. The sizes (in bytes) for these files are as follows: original JPG — 58757, CMP—12654 and GIF—100428. In this instance of a natural scene photograph, the CMP format exhibited an unexpectedly large file compression on the original JPG format, producing a file that was less than 22% of the size of the original JPG file. The GIF format, on the other hand, performed poorly, producing a file that was 70% larger than the original JPG file.

Fig. 2

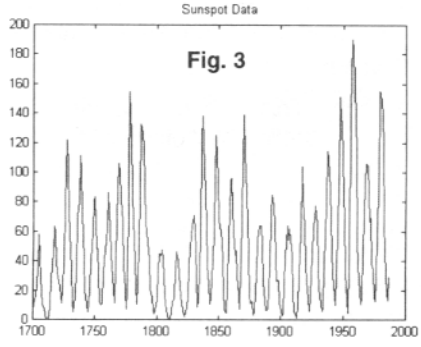


Fig. 3

**A Vector Graphics Compression Example Using Sunspot Data**

Fig. 3 is a data plot of observed Sunspots by year from 1700 to 1990. This plot was printed from a 9032 byte GIF file which was screen captured from a MATLAB data plot of a sunspot data file. (MATLAB is a set of mathematical and engineering related programs, with display and plotting facilities.) The sunspot data file used to create the plot is a 3456 byte text file, and the plotting of the data was controlled by a 73 byte MATLAB command (text) file.

The sunspot data file and the MATLAB command file can be losslessly compressed using PKZIP or ARJ into single files with the following sizes: ZIP—1467, ARJ—1447. Either of these two compressed files containing all of the "information" needed to create the sunspot data plot (after de-compression and use of the MATLAB application) is only 16% of the size of the GIF file containing the actual data plot.

This is an example in which a complex digital image may be created by computation from a relatively small file containing "vector" information. The potential problem here is, of course, that the user must have the application (MATLAB in this example) to perform the computations to create the display from the small vector file.

**Next Time**

In the final installment, we will provide more detailed information about how to use of image manipulation software, and provide specific examples of how to use low cost computer input devices to capture digital images to be used in digital communications.

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# On-Air Measurement Comparisons

**of HF and Packet Throughput - Part 2**

*by Ken Wickwire, KB1JY*

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## One-Hop Skywave Paths

Dennis Gabler KB5HVN, Doug Hall KF4KL, Richard Harrison NT2Z and Ken Wickwire KB1JY recently finished the second phase of a program to analyze a large amount of on-air throughput measurements in the packet, Amtor, Pactor and Gtor modes. This time the measurements are over relatively long one-hop skywave (OHS) paths rather than the short near-vertical-incidence skywave (NVIS) paths featured in the first phase. As before, the team is carrying out the program to put various claims about HF throughput in perspective, and provide a basis on which to assess throughput claims for more advanced modes, which offer things like sophisticated forward error-correction, automatic adaptation to changing HF channel conditions, and equalizers.

The measurements were again gathered automatically with a program written in C for the Macintosh. All participating stations used Kantronics KAMs (Pactor implementations other than KAM's may show somewhat higher or lower average throughputs in that mode)equipped to run packet and the three TOR modes. The receiving KAMs had their ARQBBSs set to ON and were waiting in TOR STANDBY or in command mode (for packet measurements). The program instructed the local (sending) KAM to connect to a receiving KAM in each of the modes in turn. After each connect in a particular mode, and the appropriate confirmations and handshakes with the receiving BBS, an ASCII text file of specified size was uploaded to the receiving KAM's mailbox. All files were in English with mostly lowercase characters. This file choice, and the use of the KAM, were meant to reflect a "common" operating setup. Since the optimum file size for highest throughput and minimum test time was found to be around 2-3k characters, most of the OHS transfers used 3k files.

The program logged the link and file transfer times and calculated the throughput in characters/sec from the file size and transfer time. The time-tagged logging file was later analyzed off-line with a separate program that calculated various statistics, such as mean and standard deviation of the link and transfer times, the throughput, and so on, for each of the modes.

The transfer time is defined as the time between start of the transfer and receipt of the "MESSAGE SAVED" prompt from the receiving BBS. Because of the short time needed to send the MESSAGE SAVED notification, the measured throughputs are slightly pessimistic from the standpoint of the receiving station, but this is a price worth paying for completely automatic measurements.

This second phase involved OHS paths from 750 to 2000 km long, between stations in Massachusetts, Maine, Iowa, Virginia and North Carolina, at all times of the day and evening. OHS paths show less multipath, D-layer absorption, and nighttime noise and interference than NVIS paths, so we expected that our OHS measurements would represent an upper bound on throughput performance in the TOR and packet modes. The measurements were run in the 17m, 20m, 30m and 80m bands, and we tried successfully to avoid frequencies with a lot of interference on them. This made our throughput measurements independent of hard-to-characterize interference environments. We logged over 100 transfers in each mode, providing sufficient confidence that our measurements yield valid statistics for TOR and packet file transfers at current low sunspot numbers.

For the packet transfers we kept the baud rate at 300 and adjusted packet length and maxframes to achieve maximum throughput. Although we did not keep track of numbers of failed transfers, all four modes usually got files through during the day on every try. This contrasted with the NVIS trials, where Amtor and packet transfers often failed during marginal daytime conditions.

Here's a summary of our OHS findings, with all paths and all file sizes lumped together. The throughputs are all in characters/sec. Huffman compression was used for all the Pactor transfers. (We may report later on Pactor and Gtor throughput for uncompressed binary files.) Std. Dev. stands for "standard deviation," a measure of statistical spread. Max. Thruput is the maximum throughput observed in the OHS tests. We'll publish a more detailed breakdown of our OHS data elsewhere.

| Mode | Avg. Thruput | Std. Dev. Thruput | Max. Thruput | Sample Size |
|---|---|---|---|---|
| Gtor | 32.3 | 9.9 | 44.1 | 158 |
| Pactor | 20. | 5.5 | 25.0 | 153 |
| Amtor | 5.7 | 0.8 | 6.3 | 104 |
| Packet | 15.7 | 4.6 | 24.6 | 108 |

The relationship between the Gtor and Pactor average throughputs in this table again hides the fact that Pactor sometimes did better than Gtor, especially when the signal-to-noise ratios were low. However, this happened on OHS paths much less often than on NVIS paths.

A comparison of these results with our NVIS results (see the March 1996 issue of the Digital Journal) shows that Amtor and Pactor average throughputs differs little on OHS and NVIS paths. The big story is the differences between Gtor and packet performance on long and short paths. Average Gtor throughput on OHS paths was almost 50% higher than on NVIS ones (32 char/s vs 23 char/s). This probably reflects the presence of consistently higher signal-to-noise ratios (SNRs) on OHS paths, since Gtor is said to thrive on high SNRs and suffer more than the other modes on low ones.

Packet throughput was two-and-a-half times higher on long paths than on NVIS ones (16 char/s vs 6 char/s). Some of this difference may have been caused by the fact that we restricted all our NVIS tests with packet to 200-baud operation. Although we based this restriction on observations of performance, it's possible that a more aggressive choice of baud rate on packet during the mid-morning and mid-afternoon "NVIS windows"

*(cont'd on page 25)*

# Digital Satellites

**How to work 'em and more out of this world info**

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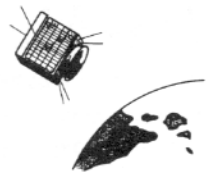
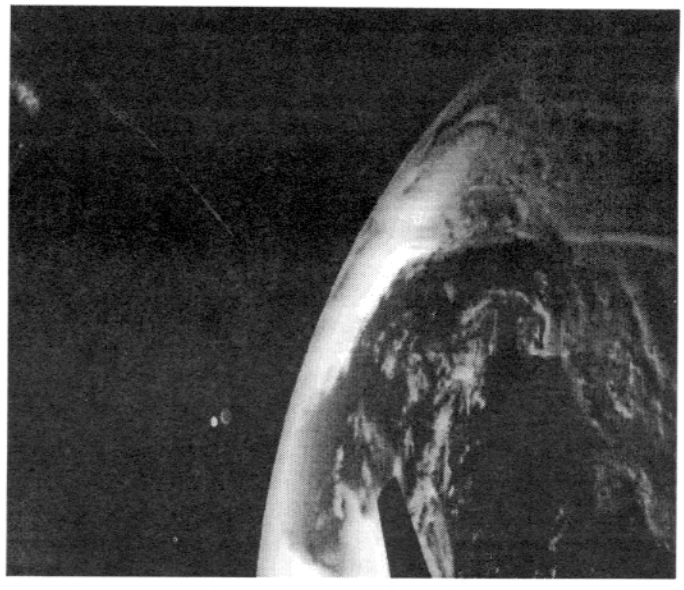


## Pictures from Outer Space

The Microsats carry cameras as well as the communications transponders and some of the pictures they are taking are remarkable and interesting when one considers the small size and cost of these little birds. For example this is a picture downloaded from KO-23 of part of Western Europe. Scandinavia is clearly seen as is the cloud cover that was extant at that time.


As well as these pictures the users upload graphics from time to time and you never know what you will see from these. Here is a nice shot of the MIR space station downloaded from KO-23.



The first successful Microsat to send pictures back to earth was Webersat which was launched at the same time as PACSAT LUSAT DOVE UO14 and UO15. UO15 also carried cameras but unfortunately died soon after launch and has not been heard from again. WEBERSATS pictures were quite good but required special software to read them. This satellite is now being used by the APRS system and can be used to determine your location on the ground. It is still transmitting pictures but on a restricted schedule. It is a little tricky to receive at this time as its signal is weak and has a spurious whistle in its transmissions. But it is 1200 baud and does not require the more sophisticated equipment needed for the other camera carrying birds.

The best ones to use at this time are the Korean KITSATS, KO-23 and KO-25. They have strong signals and are quite reliable. To receive image files you are going to have to make some changes to your software. If you have been operating with sending and receiving messages you undoubtedly have image files locked out. You may not have done this intentionally but chances are that the defaults in your package have done this for you. I will explain to you here how to defeat these defaults if you are using WiSP or the PB/PG software. If you are using something else then you will have to figure it out from your manual.

In WiSP and PB/PG equations are used to instruct the software how to perform, in particular what files you are interested in and more particularly, what files you are definitely not concerned with. No point in cluttering up your machine with stuff you couldn't care less about. Here is probably what your equation file looks like now:

```
[auto]
{
(destination = "ALL" & filesize < 25000)
}
```

*This results in downloading all files addressed to "ALL" and less than 25k bytes long*

```
[priority]
{
title    = "DX"   |
```

*This will download first files concerning DX WISP or TRAKBOX*

```
title    = "WISP" |
destination = "WISP" |
destination = "TRAKBOX"
}

[never]
{
(filetype > 199 & filetype < 211) |
(filetype > 212 & filetype < 255) |
filetype    = 2        |
destination = "TEST"   |
title       = "TEST"   |
source      = "ZL2TPO"
}
```

*This will prevent downloading of BBS IMAGE Various satellite housekeeping files TEST files and files addressed to ZL2TPO*

The last part, never, requires some explanation. When files are uploaded to the satellite they are assigned a file type depending on the content. For example type 2 files are BBS files and files of type 14 15 16 and 211. The "|" and "&" symbols represent the Boolean expressions "OR" and "AND".

So now we need to give priority to image files and to remove them from NEVER. So first we must add to the second entry (PRIORITY) the following lines:

```
filetype = 14 |
filetype = 15 |
filetype = 16 |
filetype = 211 |
```

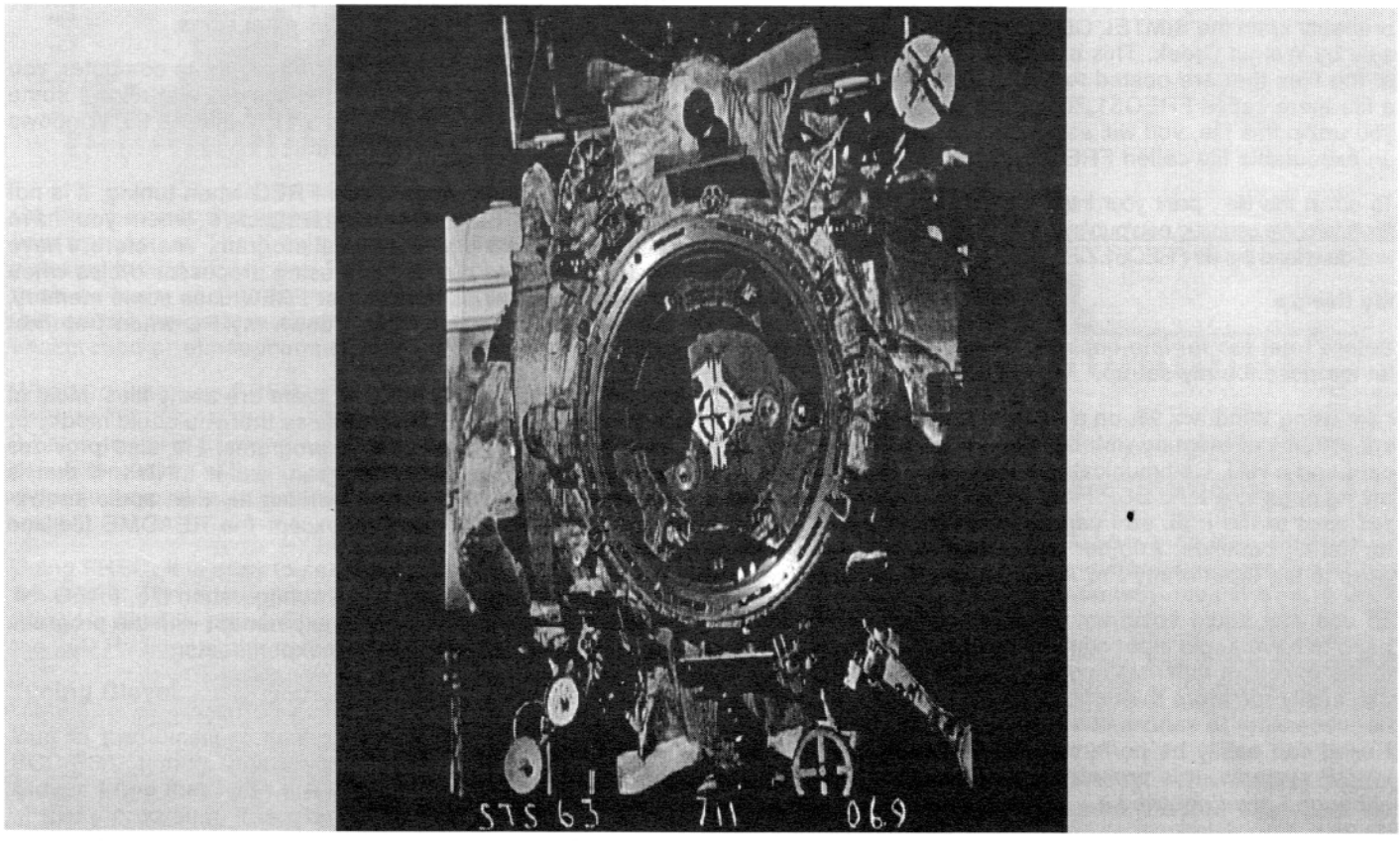
being sure to add the OR symbol ( | ) after "TRAKBOX"

Now we must change the NEVER section to read

```
filetype > 222  &  filetype < 255
```

. . . and that will now download all the image files as they become available. These files, when they appear in the IMAGE sub directory are of the form "GIF" or "JPG" and may be viewed with any regular image viewer.

To end this story here is another image file I received recently from KO-23. This is the MIR docking port for the Space Shuttle.



# Across the Pond

## A look at the *digital-doings* of our European neighbors

*by Neal Campbell, AB4MJ/ON9CNC • 10817 Ann Davis Dr. • Fredericksburg, VA 22401*

*Internet: neal.campbell@ping.be*

A few months ago, many interesting messages were posted to the Internet mail reflector dedicated to advanced digital techniques concerning tuning indicators. It is obvious that this topic interests many users of HAL clover-capable devices as there is no option for the familiar mark/space scope output upon which RTTY users have become dependent. If you are not a member of the advanced digital techniques mail reflector, you can subscribe by sending to majordomo@iea.com a mail message with the text being "subscribe adrs-digital' followed by your e-mail address.

Paul W4ZB responded by stating that he used no external tuning indicator, he used a audio spectrum analyzer. He mentioned the name of the product he used, which I followed up on, and unfortunately is no longer sold for private use. I was incredibly curious about how well the concept would work, so I started searching the Internet and BBS's for audio spectrum analyzers that were affordable and flexible enough for usage as a tuning indicator.

### Freq'ing Out

I downloaded several utilities from various sources with little success. Most were too general for usage, or geared for MIDI musicians. I was beginning to believe what was an excellent idea would not be possible.

I then searched one of the best places to find MSDOS/Windows utilities, the SIMTEL file archive. If you have attended any hamfest in the last 3 years, you have probably seen the SIMTEL CD ROM of MS DOS utilities for sale by Walnut Creek. This excellent CDROM is an extract of the files that are posted to the SIMTEL net site. I found a file there called FREQ51.ZIP, which I downloaded. When you unzip this file, you will see a great number of files, and an executable file called FREQ.EXE.

To obtain this file , point your Internet browser or FTP program to: ftp://uiarchive.csu.uiuc.edu/pub/systems/pc/simtelnet/msdos/sound/ and download the file FREQ51.ZIP.

### My Set-up

Before I get too far into outlining how to use this software, let me describe my set-up.

I am using Windows 95, on a PC with a Pentium 90 processor, 16 MB of memory, Media Vision Pro Audio 16 sound card and a HAL Communications P38 card. The audio from my rig goes to a MFJ DSP Filter (MFJ-784). One audio output goes to the P38, so I can use the MFJ-784's RTTY filter during contests. Another audio feed from the MFJ-784 goes to the input of my Pro Audio 16 sound card.

To use any audio spectrum analyzer on the PC, you will need to have audio input coming into your sound card. Due to the excellent multi-tasking capabilities of Windows 95, I can easily run more than one program at a time, but this is not necessary to successfully utilize FREQ. The technique I used can easily be performed on Windows 3.11 or OS2 WARP systems. It is probably useable under DESQVIEW, although I have not tried it.

### FREQ

FREQ is a freeware program. That means that the author, Philip VanBaren (phillipv@eecs.umich.edu), requests no money for the program.

To quote from the excellent README file:
"FREQ.EXE is a program for the ProAudio Spectrum/Studio 16 sound cards, Soundblaster compatible 8-bit cards, and cards supporting the VESA audio interface BIOS extensions.

The program samples the input, performs an FFT, and graphs the output. INI file and command line options provide the user with the ability to select linear/log frequency and amplitude scales as well as sampling rates, length of the FFT, and windowing functions. Graphics is done using the VGA 640x480x16 video mode, so a VGA compatible card is required. The program will only run on computers with an 80386 or above processor. A coprocessor is recommended, but not required."

To use FREQ, here are the compatible sound cards listed in the README file:
- ProAudio Studio (PAS mode)
- Logitech Soundman (PAS mode)
- Soundblaster 16 (SB16 mode)
- Soundblaster (SB mode)
- Sound Galaxy 16 NX (SB mode)
- GUS MAX (SB mode with SBOS)

??? if it supports VESA AI BIOS extensions.

Unless you want to run FREQ on a separate computer, you need to be running an operating system that allows some form of multi-tasking (Windows 3.11, Windows 95, Windows NT, OS2 Warp, DESQVIEW, etc.

Because you only want to use FREQ when tuning, it is not necessary to have the program active when you have switched to your digital terminal program. Therefore, I have configured it so that it is not using processor cycles when it is not active. This means that FREQ uses some memory, but otherwise does not slow down my PC when I am not using it.

When unzipping FREQ51.ZIP, there are many files. Most of the files relate to C source code so that you could modify or include his routines in other programs. He also provides techniques for using the program under LINUX, if that is your preference. As I am not writing my own audio analyzer, I ignored all of the files except the README file and FREQ.EXE.

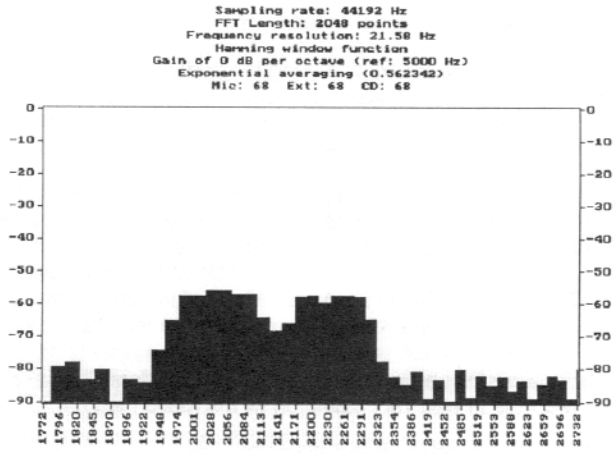
To configure FREQ, there is a configuration file, FREQ.INI, which can be modified as you experiment with the program. Here are the settings from my experiments:

Soundcard: 1
Sample rate: 44192
Rate fudge factor: 1
FFT length: 2048
Window function: 0

Bar display: 1
Log freq scale: 1
Log amp scale: 1
Base db: 8
Top db: 0
Max amp: 0.05
DB/octave gain: 0
Reference frequency: 5000
Base frequency: 1771.64
Frequency factor: 16
Decay mode: 2
Decay factor: 0.316229
Averaging count: 1
Background color: 0,0,20
Clipping warning color: 20,0,0
Graph color: 30,35,60
Tick mark color: 40,40,40
Axis label color: 50,20,45
Border color: 40,40,40
Text color: 55,55,25
Cursor upper color: 20,20,20
Cursor lower color: 63,63,63

**Test Drive**

Once you have the program unzipped and the INI file updated, its time to give it a test drive. See Figure 1.



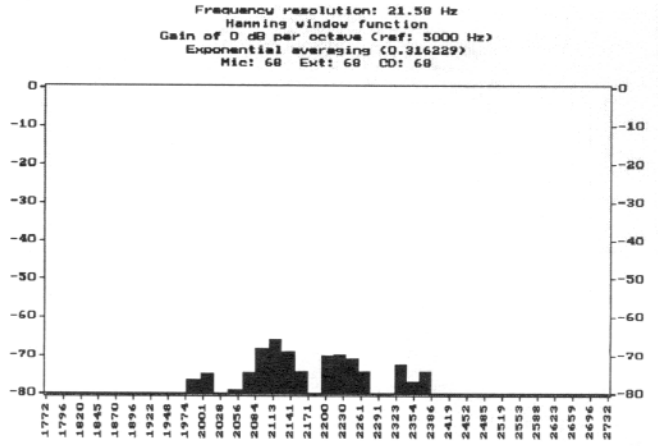

On the Y-axis is the signal level from the audio output of your transceiver. The X-axis has the audio frequencies. By pressing the PAGE UP and PAGE DOWN buttons, you can raise or lower the audio sensitivity. I usually manipulate this once I am near a desired signal, in order to reduce background or atmospheric noise from the digital signal.

When you start up FREQ, it is tracking the signals in real time, so the display bars will be jumping rapidly. I find that it helps to inject some averaging to better identify the signal. Experiment with the plus and minus keys from your numeric keypad to adjust the amount of averaging for your taste.

Using FREQ, it is easy to see the effect of your IF filters on the audio. The screen display above was taken with my 2000 Hz filter in place. The display below was taken with the 250 Hz filter at the same signal level and sensitivity.

**Tuning Clover**

Due to the excellent tuning aids in Express, XPPCI and PCC/P38, tuning indicators are not really needed with Clover. I find that I can easily tune Clover stations with all of these programs. It is interesting however to see what a Clover signal looks like with FREQ. See Figure 2. From the

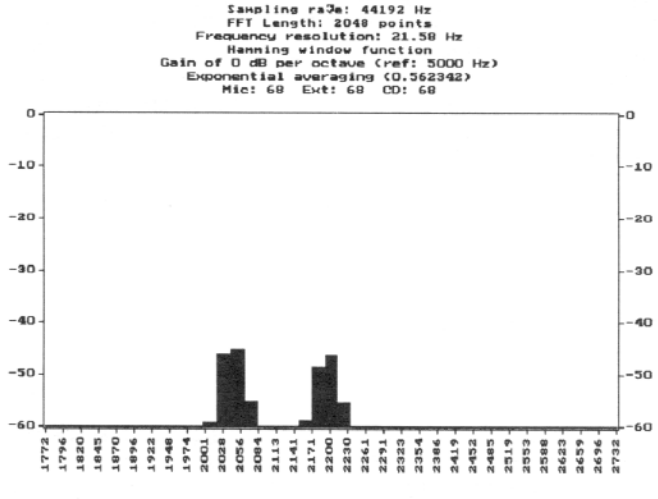



display, you can easily see the four tones used by Clover. This was a very weak signal, but easily identifiable.

If you follow the technical details of Clover well, you will know that Clover can exist within a 500 Hz bandwidth, and the chart above demonstrates that capability. I was using a 500 Hz IF filter at the time I snapped this screen. One nice thing that FREQ can do is let you see how congested the frequencies around you are. You can see how close that Pactor or Clover station is to you with FREQ..

**RTTY**

As RTTY is my main "other mode", usage of FREQ with RTTY was my main interest. Below is a perfectly tuned



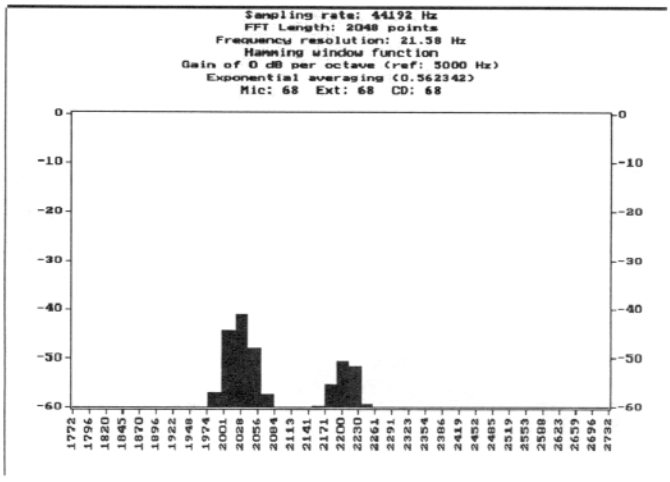

RTTY as displayed by FREQ in my shack. See Figure 3.

With the P38, AFSK tones are generated at 2125/2295 Hz. From the display above, you can see that FREQ measures the tones at 2050/2220. I have no idea why this 75 Hz difference occurs, but it is uniform amongst the modes that I have used. Once you mentally adjust to it, it is no problem.

Since using FREQ, I find that I can see RTTY signals that otherwise I would not know existed, and can tune for them.

**Pactor**

Tuning a Pactor signal is as easy. The screen display below shows a properly tuned Pactor signal at my shack. See Figure 4.




### General Usage

I must caveat this discussion by saying that when I am using Express 3.5, I do not always use FREQ, as I find the tuning indicator in Express to be quite good. One reason to use it with Express, however, is that sometimes I can identify Clover signals before they "sound" like Clover. The screen snapshot of the Clover signal shown earlier was one that I discovered at 14078 while tuning the band with FREQ. I could see the 4 tone signal long before I could identify the signal as Clover, and was able to tune it immediately.

I always use FREQ when I use XPPCI or WF1B. It enables me to lock into the right frequency faster than with a scope, as I can "see" more of the band.

As FREQ is a DOS program, I start it up as a DOS window in Windows 95. I then start up XPPCI or WF1B in another DOS window. I make sure that FREQ is always suspended while in the background, and that XPPCI is not. I go to FREQ when I am tuning the band, and switch to XPPCI when I want to see who I am tuned to. I use ATL-ESC key combination to switch to and from FREQ.

I keep a little chart by my computer to help me remember the tuning:

| Mode | Low | High |
|---|---|---|
| Clover | 1980 | 2375 |
| RTTY | 2050 | 2220 |
| Pactor | 2025 | 2225 |
| Amtor | 2050 | 2220 |

You do not need much audio drive to register good results with FREQ. On my system, if I drive the audio too strongly, it will cause my screen to jiggle around. Whenever I see that occur, I always back off the gain. If you experience this phenomena and find a cure for it, please write me.

I think that a freeware solution like FREQ is an excellent alternative to outboard mark/space detectors feeding a scope. I admit that it takes a reasonably equipped computer for effective use, but maybe it is time to get that old 386sx16 system upgraded anyway!

Next month I will be recovering from my trans-Atlantic trip to Dayton and will start a series on how to effectively use the Internet. We will start with E-mail and file attachments!

*Until next month -73, Neal*

# Software Review

*Review by Tom Delano, NR1J*
*97 South Street • Duxbury, MA 02332*

## AEA MacRatt III
### New and Improved Version

Good news for Macintosh computer users who also use AEA TNC's! AEA has just released a totally new version of it's MacRatt Software - MacRatt III - which brings many new operating features and functions to Macintosh users who operate the digital modes.

MacRatt III is very easy to setup and operate. For someone new to the digital modes, MacRatt III is as close to "plug and Play" as you can get. For longtime users of AEA's MacRatt 2.1 software (I count myself in this category), the ease of use of MacRatt III, its many new features and its improved performance will rekindle their excitement in using the Macintosh on the digital modes.

**MacRatt III - Overview and Specifications**

MacRatt III supports all currently available AEA TNC's including the new DSP 232. AEA recommends that, at a minimum, the TNC have firmware dated 1991 or later. Firmware dated 1993 or later is strongly suggested.

MacRatt III supports the following digital modes: VHF Packet, HF Packet, Pactor, Amtor, Navtex, Baudot, ASCII, Morse, TDM and SIAM. Fax mode is not supported in this version of MacRatt III, but may be included in later releases.

MacRatt III requires just 1 meg of RAM and 1 meg of disk space. It will run on Macintosh's with System 6.07, System 7.0 and 7.1, and Mac O\S 7.5. Because of the unusually small memory foot print (990k), MacRatt III runs very nicely on older Macintosh Plus SE's and LC's. On newer Power PC Macs, MacRatt III runs in emulation mode. I run MacRatt III on a five year old Macintosh Classic in the shack and performance is very good. In comparison tests on a PowerBook 5300c and a Quadra 610, MacRatt III did run slightly faster. MacRatt III was very stable on all the Macs I tested.

New features in MacRatt III include:

-support for two TNC's on separate serial parts
-multiple windows for simultaneous contacts
-cut, copy and paste between windows and buffers
-split screen operation: receive and transmit
-color, or B&W monitors supported
-binary and MacBinary file transfer (YAPP compatible)
-status display and toolbar on active windows
-maildrop interface
-integrated text editor
-full support of the Apple Guide online help (System 7.5 only)

MacRatt III adheres closely to Macintosh user interface and programming guidelines and as a result it can be used with all Macintosh printers and other peripheral devices.

**MacRatt III Features**

Setting up MacRatt III is just a simple matter of dragging the program files from the floppy disk over to the hard drive and double clicking the MacRatt III application. MacRatt III prompts the user for information on the Macintosh serial port, TNC model and the baud rate for the TNC to computer interface. Once this minimum information is supplied, MacRatt III will initialize the TNC after putting it into host mode. The TNC setup file is saved to the hard drive so the next time the user wants to use MacRatt III all upi need to do is double click on the TNC setup file. All TNC settings, transmit buffers

and preferences are saved as part of the TNC setup file. I find it easier to just place an alias of the TNC setup file in the startup items folder in the System Folder so each time my Mac Classic is turned on it automatically launches MacRatt III.

A major improvement in MacRatt III is it's use of windows. Windows are created for each Packet, Pactor, Baudot, and Morse session. A separate window for viewing TNC commands is also available. Windows used for sending text, such as Packet and Pactor windows, are split in two parts with the top part used for receiving text and the bottom part used for sending text. The window dividing line is adjusted by placing the cursor on the dividing line, clicking and holding the mouse button and moving this dividing line up or down. Other new window features include: selectable text fonts and font sizes; selectable colors for backgrounds, characters and highlights; status indicators and buttons. The window buttons make the most common mode commands (Xmit/Recv, TxRev/RxRev, Mailbox etc.) readily available to the user at the bottom of the window. The command window is used to monitor all TNC commands. TNC commands may also be sent to the TNC by typing the command directly in the command window.

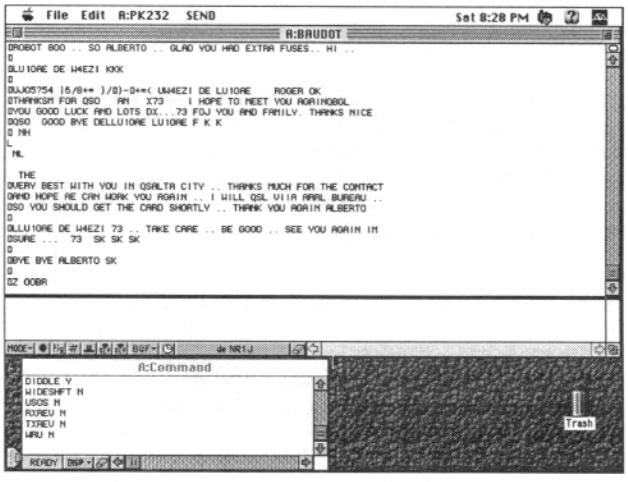
### Packet

Packet operation with MacRatt III is very straightforward and similar to other TNC Packet programs. Separate windows are created for each packet connection with each window able to hold up to 28,000 characters. A big improvement over previous versions of MacRatt III is the ability to call up or save a list of stations with which the user regularly connects. Another improvement in packet and other modes is the ability to open a dialog box and easily change common mode parameters. I personally find this feature a big help in trying to remember the many parameters in each mode.

### Baudot

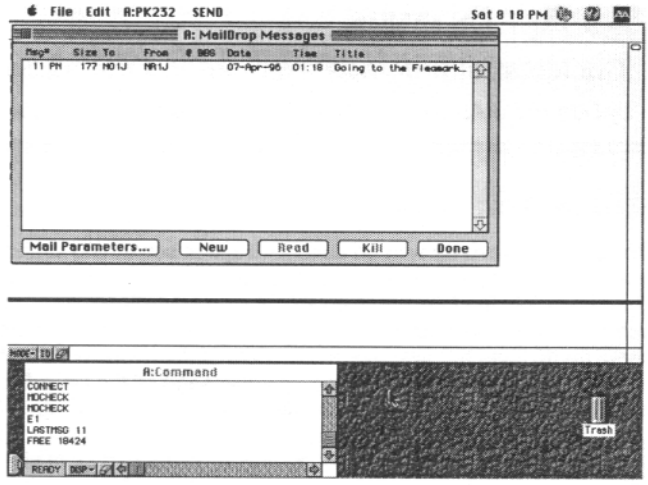
The Baudot window is the standard split window for displaying both sent and received text. Having the most needed Baudot commands and the transmit buffer as buttons at the bottom of the window improves RTTY operating enjoyment.

### Pactor




The good news here is that MacRatt III fully supports Pactor which was not the case with prior versions of MacRatt. As in the other modes, separate windows are created for Pactor Listen, Pactor Standby - UNPROTO, and Pactor Link. When linking in Pactor, as in Packet, a list of stations is called up and a callsign selected, or the station callsign may be typed directly into the Pactor link dialog box. A check box for long path protocol may also be checked if needed. Cutting the link at the end of the QSO is done by selecting "kill link" from the TNC menu or by changing to another mode.

### Mailbox




MacRatt III allows easy access to your TNC's mailbox in Packet, Pactor and Amtor and maybe activated or deactivated by pressing the button at the bases of the mode window. The list of messages is displayed by selecting "mailbox" from the TNC menu. Once in the TNC maildrop, messages may either be created, read or killed. For users who have PlainTalk (Apple's text-to-speech technology) installed on their Macs, an interesting and undocumented feature they should try is to hold the option key down while clicking on the read button. The Mac will read aloud the highlighted message.

### Transmit Buffers

MacRatt III greatly expands the use of transmit buffers. A separate set of 10 buffers are available for each mode. The normal Mac editing features allow text to be cut, copied, pasted, cleared and deleted in each buffer. A numeric command key is assigned to each buff er for users who prefer the keyboard to the mouse. A label may be assigned to each buffer; e.g., CO, report and QTH, brag and so forth.

### File Transfer

Both text and binary file transfers are supported by MacRatt III, however, binary files may only be transferred in Packet. File transfer is started by selecting text file or binary file from the Send menu. The Open dialog box then prompts you to locate the file on the disk drive and to select the Open button when the file is found. During the file transfer, a status bar displays the progress of the file transfer

### On the Horizon

Kevin Krueger, NOIOS, and AEA are to be commended for giving Macintosh users an exciting and impressive new TNC program. They have listened to what Mac users were saying and the result is MacRatt III. MacRatt III comes with a comprehensive, easy to understand, 1 00 page User's Reference that allows the user to take advantage of it's many features.

What can Macintosh users look for in future versions of MacRatt III? Kevin has said he will keep MacRatt III up-to-date with new AEA TNC's and operating modes as they become available. Look for future versions to have Fax mode and support for Apple's many emerging operating system technologies. Future versions may also be "fat binary" and will, therefore, contain native code for PowerPC Macs.

MacRatt III sells for $99 list from AEA Dealers. Registered users of MacRatt 2.1 may upgrade to MacRatt III for just $55 by contacting AEA directly.

# DX News

## The latest digi-doings from around the globe

*by Don Hill, AA5AU PO Box 625, Belle Chasse, LA. 70037 • email: AA5AU@aol.com*


### FT5WE & FT5WF - Luck, Skill, or Zen?

On April 4th I woke up with an eerie feeling that something strange was going to happen. I walked into the shack and turned on the rig. I had been looking for Crozet on RTTY ever since Sam and Jack had arrived on the island the previous month or so, but had not heard them. I had not even seen any spots for them on RTTY from NA. The previous day I had picked up a message off the DX reflector from a W5 station that had worked them longpath using 100 watts on SSB. In all my searching for them, I had not contemplated looking longpath since my propagation program had them short path in my mornings.

Tuning across the digital portion of 20 meters at 1230z I came across only one signal. It was a weak string of RY's followed by a "CQ de FT5WF". I flipped on the amp and called him back with everything I had. There was no response. I called again. After a short delay, Jack came back to me. We exchanged reports and he asked if I could stand by for Sam, FT5WE. Sam called me and we exchanged reports. Soon afterward, Floyd N5FG made the same double contact and they faded away. They had not been spotted on RTTY since this went to the editor. Was it luck? You bet it was!

### JX7DFA activates Jan Mayen on RTTY

Per, LA7DFA, has been doing an excellent job on Jan Mayen Island as JX7DFA. He has been giving out RTTY contacts to the entire world, including North America, despite mountains blocking NA from his eastern QTH. There is a western QTH that has a better shot to NA, but Per does not expect any operation there until the middle of this month.

*Deadline Flash! Per activates the western QTH on 3 May on 20 meter CW and relays to Barry, W2UP, that the RTTY gear is on it's way! He's a month and a half ahead of schedule.*

In April and May, Per delighted RTTY operators with his appearance despite poor band conditions. Per prefers VHF DXing, using EME, etc. He refers to himself as a CW operator. But what he did for RTTY has shown that he is a top notch Digital DXer as well. On his first day with NA on RTTY, he split us down 30 *khz* from 14091. And it worked! All this was made possible by Randy, WX5L. He picked up a lead on the Internet that led to something special for RTTY.

### TI9X DXpedition on RTTY

A joint Costa Rican-Japanese effort from Cocos Island in April and May included a good amount of RTTY activity. The group even operated on 30 meters to help JA stations get this rare North American island in the log. Japan can only operate digital above 10140 *khz*. The group showed up on RTTY in less than 24 hours after the DXpedition began. This shows RTTY is starting to get a lot more respect from DXpeditioners. QSL via JH1NBN CBA.

### J28JJ/7O Yemen

Jean-Jacques, J28JJ, made appearances on RTTY from Aden for four consecutive days in late April. He was using 100 watts and a vertical antenna. EU and some AS stations made contacts, but I received no reports of him being worked in NA. Dick, N1RCT in Maine, relayed to me that he copied Jean one time and was confused with the callsign. He thought he was printing /70 instead of /7O. Since he had already worked Jean from Djibouti, he didn't jump into the pileup. Once he found out the situation, it was too late. Don't worry Dick. Luciano, I5FLN, reports that Jean did not have a license in-hand, so it is doubtful that contacts will be good for DXCC awards.

This operation could open the door for futures trips to Yemen. 7O is ranked in 2nd place of most needed countries on RTTY. It is nice to see activity from this ultra-rare location. And it is even more important to note that the operation was on RTTY. Let's hope Jean-Jacques can make it back again soon.

### More Digital DX on the World Wide Web

Last month, our editor Jim, included the http address for the OH2BUA Webcluster site. At present, it is the most comprehensive site for up-to-date DX information. For you Web surfers, the Digital Journal Web site has changed to <http://www.n2hos.com/digital/>. It is the most current source for Digital DX information. Jim has arranged so that I am able to send him Flash DX messages and he posts them on the site. By sitting in front of the DXpacketcluster all day and receiving E-mail on three separate addresses, I hope to be able to keep the information flowing to Jim. I need your help. Anytime you have information, you can E-mail it to me from the Digital Journal site now. I will then get your information out to the rest of the digital gang.

### Telnet to the DXPacketcluster

The DXPacketcluster is the most popular way to track current DX. The DXPacketcluster system today is becoming more global because of the Internet. Most of us connect to a local node via 2 meter packet at 1200 *bps*. Nodes are connected to other nodes at 9.6 *kbs* or higher at VHF or UHF frequencies to form small DXPacketcluster networks. Today, nodes are connecting via the Internet in a big way. These nodes are using the Telnet capabilities of the Internet to form very large spotting networks. This is exciting news for the avid DXer.

Anyone with Telnet capability can connect to DXPacketcluster nodes without a radio. Some nodes like to keep their IP addresses anonymous, but there are several that welcome DXers to check in. I will concentrate on the WU3V, VE3CDX, and PY2XB-6 nodes since those are the ones I normally log onto when I am at work and away from my radio shack.

How can you Telnet? Not being an expert, I can only relate how I connect. From my network at work, I use the Telnet program in Windows 95 to access the nodes that are on the Internet. At home I use CompuServe. Although I use America Online for most of my E-mail at home, AOL does not offer Telnet services as of yet. It's best to call your Internet provider to determine whether or not Telnet is available.

Jim Moore, WU3V, runs a node in Abbeville, LA near the campus of University of Southwest Louisiana. Jim's networking background at the university allows him keep a reliable system in operation. Since Jim has put up a few fire walls to protect his network, it would be advisable to first send him an E-mail and request that he add you to his list of stations allowed to connect. Jim has told me that any DXers are welcome to use his system. Jim's E-mail address is <jim@usl.edu>.

To connect to WU3V via Telnet, you connect to Jim's IP address at either <linux.wu3v.ampr.org> or <206.104.41.241>. You will be asked to log in. There you will input your callsign. You will then be asked for a password. Since he has already added you to his list of

users, a password is not needed. You will then see a list of commands. Type DXC to access the DXPacketcluster. That's all there is to it!

Another popular DXPacketcluster site is VE3CDX. His IP address is <ve3cdx.cdx.net>. The main difference between VE3CDX and WU3V is that there is limited "T TALK" capabilities using VE3CDX. There may be several hundred users on the system, and you will get many of the same spots that you would from WU3V, but you will not be able to "T TALK" to most of the users. The advantage of the VE3CDX site is that you don't have to be added to a users list to access it. It's available right away.

Another interesting site is the PY2XB-6 DXPacketcluster. This one is a little more tricky because once you access the Internet site in Brazil at <143.108.1.123>, you must then connect via a 19.2 kbs UHF link to another node in Sao Paulo with "c uhf jagua1". Once you have connected to jagua1, you connect to PY2XB-6 with the "dx" command. Thanks to the SYSOP, Fred, for allowing me to advertise his node. Fred is also an active RTTY DXer.

## Digital Doings

**Aland Island, OH0.** OH0/SM3KOR showed up on RTTY in early May. QSL direct to the CBA at: Lars Lindahl, Knorringsv 20, S-81203 Kungsgarden, Sweden.

**Ceuta & Melilla, EA9. EA9JZ** has been spotted on 20 meter RTTY recently. QSL to: Antonio Gutierrez Ramirez, Cortijo de Torres 7 4-2, 29006 Malaga, Spain.

**Ethiopia, ET.** This report is from Waldemar, DK3VN, who says Peter, ET3BN is active on 20 meters around 1800-1900z near 14085 khz. Peter prefers cards direct to POB 150194, Addis Abeba, Ethiopia. Sid, ET3SID, was also active in April and May. Sid's QSL route is published as: Sid T. May, Box 60229, UNECA, Addis Ababa, Ethiopia.

**India, VU. VU2AVG** can be found almost daily on 20 meter RTTY around 1600z. Callbook address is: Avinash Vasantrao Gundale, 2079/14 K Ward E, Bharat Co Opr Housing Society, Kolhapur 416001, India

**Indonesia, YB.** A DXPedition to Togian Island, IOTA OC-213 played RTTY. No QSL route available at press time.

**Isle of Man, GD.** Graham, GD0WKX, was worked at 1300z on April 13th. Graham braved the USA and European pileup for several hours before he ran out of propagation.

**Kyrgyzstan, EX. JA3CMD** reports that EX7MA was active on 14083 at 1400z on May 3rd. EX is one of the rarest former Soviet Republics. I hope to have further info on this one (I need it!)

**Tanzania, 5H. 5H3LM** has been spotted on RTTY.

**Vietnam, 3W. 3W5FM** continued his operations into early May. It has been reported that he went QRT on 9 May but will return to Vietnam in October or November of this year.

**Zaire, 9Q. SP4CHY** reports that 9Q5PAU was active on RTTY in May.

# Contesting

## Coming Events and Awards

*by Rich Lawton, N6GG • 14395 Bevers Way • Pioneer, CA 95666*

## — RTTY Contests - Coming Events —

| Date: | Contest: | from: | Rules in: |
|---|---|---|---|
| JUNE 8-9 | ANARTS WW Digital | (Australia) | May DJ |
| JULY 13-14 | BARTG Amtor/Pactor | (England) | May DJ |
| JULY 20-21 | No. Am. RTTY QSO Party | (USA) | May DJ |
| AUG 17-18 | SARTG WW RTTY | (Sweden) | June DJ |
| SEP 28-29 | CQ/DJ WW Digital | (USA) | June DJ |
| OCT 19-20 | JARTS WW RTTY | (Japan) | July DJ |

**NOTE:** I misinterpreted the Multiplier section of the EA WW RTTY Contest rules published in the April '96 issue of the DJ. DXCC countries do NOT count as multipliers, but CQ Zones DO count. I was puzzled by the rules sent to me by the U.R.E. where they changed the rules to count CQ Zones, but no mention was made of DXCC mults, which had been counted previously. I thought they just forgot to include DXCC mults. I apologize for any trouble I may have caused.

## — Reminders for Logs —

**SP DX RTTY** (April 27-28) Logs must be postmarked by June 15, 1996.

Mail to:

**Christopher Ulatowski SP2UUU**
**Box 253**
**81-963 Gdynia 1**
**POLAND**

## — — COMING UP — —

### — SARTG WW RTTY Contest —
**17-18 August, 1996**

Sponsored by the Scandinavian Amateur Radio Teleprinter Group. (SARTG)
Third full weekend in August. (Ref: SARTG, SM4CMG)

***CONTEST PERIODS:*** Three separate periods: 0000-0800 UTC Saturday, 1600-2400 UTC Saturday, and 0800-1600 UTC Sunday.

***BANDS:*** 80, 40, 20, 15, and 10M. (five bands)

***CLASSES:*** A) Single op, All Band C) Multi-op, Single Tx, all band
B) Single op, Single Band D) SWL, all band
NOTE: Single op, All Band stations may also enter as a single band entry of their choice, too.

***MODES:*** RTTY only.

***EXCHANGE:*** RST + QSO number, starting with 001.

***MULTIPLIERS:*** Each DXCC country on each band, including first contact with Australia, Canada, Japan and USA. Additionally, each call area in VK, VE, JA and W will count as one multiplier on each band.

***QSO Points:*** QSO with own country, 5 points. QSO with other countries in own continent, 10 points. QSO with other continents, 15 points. In VK, VE, JA, and W, each call area will count as a separate country.

***SCORING:*** Sum of QSO points x sum of multipliers = TOTAL SCORE.

***AWARDS:*** To the top stations in each class, country, and district, if the number of QSOs is reasonable.

***LOGS:*** Use separate logsheets for each band. Logs must show: BAND, DATE/TIME (UTC), CALLSIGN, EXCHANGE MESSAGE SENT and RECEIVED, MULTIPLIERS, and QSO POINTS. Summary sheet must show scoring, class, your callsign, and name and address. Multi-op stations must show the callsigns and names of all operators involved. Your comments will be very much appreciated.

***DEADLINE:*** Logs must be received by Oct 10 to qualify. Mail logs to:

**SARTG Contest Manager**
**Bo Ohlsson, SM4CMG**
**Skulsta 1258**
**S-710 41 Fellingsbro**
**SWEDEN**

***Comments:*** This popular contest has 3 separate operating periods, each 8 hours long, and separated by two 8 hour rest periods. The concept is quite unique and there can be no excuse of fatigue from the more senior ops. Band multipliers mean that activity will be spread over all the bands.

August means summer conditions are still in effect in the Northern Hemispheres so the low bands will have plenty of static and the high bands will have mediocre propagation. But not to worry. Activity is usually high from all over the globe. Another unique item for this contest is that single ops can also enter as a single band entry, with the band of their own choosing.

The exchange (RST + QSO serial number) means that you can keep track of your competition by comparing your number with his. If he suddenly appears with 10 more QSOs than you, it means you were a) goofing off, b) playing around on the wrong band, or c) stuck in a pileup and wouldn't give up.

Note that the first QSO with VK, VE, JA and W counts as a multiplier on each band. Also, each call district in VK, VE, JA and W will count as a multiplier. Separate logsheets are required for each band.

### — CQ/DJ WW Digital Contest —
**28-29 September 1996**

Sponsored by CQ Magazine and IDRA Digital Journal (ref: July CQ)

***CONTEST PERIOD:*** Starts at 0000 UTC Saturday, and ends at 2400 UTC Sunday, a total of 48 hours. No rest periods are required.

***BANDS:*** 80, 40, 20, 15, and 10M. (five bands)

***CLASSES:*** There is a **High Power** category (more than 150 watts) and a **Low Power** catagory (less than 150 watts). **ONLY** Single Op, All Band entries, and Multi-op single transmitter entries are eligible to enter the High or Low Power catagories. Enter one or the other, and so note in your log. Single band Assisted and Multi-multi entries are not eligible to enter these catagories.

A) **Single Op, All Band and Single Band.** One person performs all operating and logging functions. Use of Spotting Nets, DX Alert Packet Systems, telephone, etc., is NOT permitted.

B) **Single Op, Assisted, All Band Only.** One person performs all operating and logging functions. However, the use of DX Spotting nets or any other form of DX alerting assistance IS allowed. The operator can change bands at any time. Single op stations are allowed only one transmitted signal at any given time.

C) **Multi-Op, Single Transmitter.** All band entry only. More than one person operates, logs, checks for dupes, use of spotting, etc. **NOTE:** Only one (1) transmitter and one (1) band permitted during the same period (defined as ten [10] minutes). Once the station has begun operation on a given band, it MUST remain on that band for 10 minutes; listening time counts as operating time. **EXCEPTION:** One, and only one, other band may be used during the same time period if, and only if, the station worked is a new multiplier. Logs found in violation of the ten minute rule will be auto-

matically reclassified as multi-multi to reflect their actual status.

D) **Multi-op, Multi-transmitter.** All band entry only. No limit to number of transmitters, but only one (1) signal per band permitted. All transmitters must be located within a 500 meter diameter, or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitter.

***MODES:*** Contacts may be made using Baudot (RTTY), ASCII, Amtor (FEC and ARQ), and Packet. (No unattended operation or contacts through gateways or digipeaters.)

A given station may be contacted only once per band, regardless of the digital mode employed. Additional contacts are allowed with the same station on each of the other bands.

***EXCHANGE:*** Stations within the 48 Continental United States and the 13 Canadian areas must transmit RST + State or VE area + CQ Zone number. All other stations must transmit RST + CQ Zone number.

***MULTIPLIERS:*** The ARRL and WAE DX Country lists will be used. **NOTE: USA states and Canada areas also count as country multipliers.** Example: The first US State and Canadian area you work not only counts as a multiplier for the state or area, but will also count as a country multiplier for each band.

***QSO POINTS:*** One (1) QSO point for contacts within your own country. Two (2) QSO points for contacts outside your own country but within your own continent. Three (3) QSO points for contacts outside your own continent.

***MULTIPLIER POINTS:*** One (1) multiplier point for each US state (48) and each Canadian area (13) on each band. One (1) multiplier point for each DX country in the ARRL and/or WAE lists on each band. **NOTE: KH6 and KL7 are country multipliers only - not state multipliers.** Count one (1) multiplier point for each CQ Zone worked on each band - a maximum of 40 per band.

The 13 Canadian areas are:

| | | |
|---|---|---|
| VO1 | VE2 | VE7 |
| VO2 | VE3 | VE8 N.W.T. |
| VE1 N.B. | VE4 | VY Yukon |
| VE1 N.S. | VE5 | |
| VE1 P.E.I. | VE6 | |

***FINAL SCORE:*** Total of QSO points times the total multipliers.

***LOGGING INSTRUCTIONS:*** CQ WW RTTY DX logs and forms should be used to facilitate scoring and checking. **All logs must:**

1. Show times in UTC.
2. All sent and received exchanges are to be logged (callsign, RST, Zone, Country, State/VE area, points claimed).
3. Indicate State/VE area, and country multiplier *only the first time it is worked on each band.*
4. Use a separate log sheet for *each band.*
5. Have a list of stations QSOed on *each band.* (a *dupesheet*).
6. Have a *multiplier check sheet* for *each band.*
7. An overall *SUMMARY SHEET* showing total QSOs, points, Zones, Countries, and State/VE areas worked.
8. Each entry must be accompanied by a signed declaration that all contest rules and regulations for amateur radio in the country of operation have been observed.

***AWARDS:*** Plaques will be awarded to the first-place finishers in each of the operator classes. Certificates will be awarded to second and third. Certificates will be awarded to the first-place finishers in each DX country.

***DEADLINE:*** All entries must be postmarked no later than December 1.

An extension may be given if requested.

Mail logs to:

**ROY GOULD, KT1N**
**CQ WW RTTY DX CONTEST DIRECTOR**
**BOX DX**
**STOW, MA 01775**
**USA**

***COMMENTS:*** This is the most popular world-wide RTTY DX contest. It's also the most challenging. With the whole world participating, the CQ Zone multipliers, band multipliers, States and VE areas counting as different countries, there's a lot to keep track of. This contest has low power/high power classes, which brings lots of activity. With 48 states, 13 VE areas to go after on EACH band, look for lots of activity on 80 and 40M for all those easy multipliers.

## *-+- S&P... Nailing the Pileups -+-*

What's S&P? In Contesting circles, S&P is short for *Search and Pounce.* It's one of the two modes robustly used in both DXing and Contesting. (The other is *Running...* CQing to attract callers) The following is a series of hints, some learned from my 50-plus years of CW DXing and Contesting. These hints are adapted to RTTY... but there are a few major differences, as you'll find out.

- Tuning the RTTY Pileup: When you tune around the band and run into a mass of stations all signing their calls, stop in the middle and wait. You've run into a pileup. If it's not on a weekend, there's a DX station under that pile. (Contests always occur on weekends) If it's a weekend and there's a contest going on, there'll be a bunch of pileups, not necessarily on DX stations. Carefully tune for the Runner... the CQer. Notice his style, tones, dittle, etc.. In big pileups you may need to identify him quickly without his callsign, as some Runners will run dozens of QSOs without ever signing their own call.

- Don't call until you grasp the Runner/S&P methodology: Did he came back to the S&P op who;
  a) Called split? ... or zero beat? ... or zero beat on last S&P op?
  b) Called long? ... or short? ... or tail-ended? (*NOT recomended!*)

- Note how Runner responded to the successful S&P: Try to copy the successful S&P's technique, i.e., the way he called, sent the exchange, etc.. Consider this: The Runner is going for high QSO rates and every second counts. Only send the vital info of the exchange twice... like QSO number, or state.

- *ALWAYS* use "DE" in front of your callsign. Why? The majority of RTTY Contesters use contesting software, and most use *RTTY by WF1B.* The reason:
  a) A detected **"DE"** causes everybody's computer using "WF1B s/w" to beep.
  b) It hilites your callsign on everybody's screen.
  c) Runner can place your callsign in his *Transmit Window* by simply pressing *Home Key*, or clicking the mouse pointer on the first letter of your callsign.
  d) There's an instant warning if QSO is a *dupe* by a beep and a hilited **DUPE**.
  e) Tells you with a hilited prefix if Runner is a needed multiplier. Clicking the mouse on received state/province, country prefix, time, or QSO number will place data in the appropriate input field for logging. Click on any callsign on the screen will detect if you have QSOed that station before. Hey, *mouse masters*, it's possible to do an entire contest without typing anything!

*RTTY by WF1B* puts a whole new spin to DXing and Contesting on RTTY. It's novel, it's fun, and greatly enhances your ability to untangle those pileups on rare DX. You'll actually look forward to tackling those r-e-a-l-l-y big pileups!

- When conditions are marginal:
  a) Send your call twice, putting a "DE" in front of each callsign.
  b) To make your call stand out more on the Runner's screen, send a *Carriage Return* right before your first "DE", and right after your second callsign. To everyone who sees you, the effect is to make your call start and finish on a separate line from all other callers on their screens. I use this on a special F-Key by inserting *Ctrl-PM* (same as <CR>) for my special callsign sign.

In searching for CQs, don't always tune the band from low to high. You'll frequently find the same bunch of callers as you bounce from pileup to pileup. Tuning from high to low should give higher QSO rates, but needs an additional learning curve. That's because most of us have learned to tune the two-toned RTTY signals from the low pitched side... Like CW, it's LSB...

Mastering S&P is the first step in Contesting. Next is conquering the art of Running (CQing). Yes... it is an art. If you are serious, and MUST get a high score, skillful Running is a must. I'll give some views in a future article.

*((73)) See you in the pileups, Rich, N6GG*

# The Contest Chair

**Hints, Tips & Inspiration for Better Scores**

*by Ron Stailey, AB5KD • 504 Dove Haven Dr • Round Rock, TX 78664*
*Internet:ron481@austin.email.net*


# *RESULTS*

## SECOND ANNUAL WW WPX RTTY CONTEST

**Presented by Jay Townsend, WS7I & Ron Stailey, AB5KD**

Ever since Hal Blegen, WA7EGA retired from contesting, I've had to find other gurus to spark my ideas. Fortunately, there are a few other contesters and Ron, AB5KD has filled in quite nicely. Some elements of digital contesting, have intriguing implications for society and life in general. An easy place to observe this is in the various Internet discussion groups. We have had some pretty exciting happenings in the last few months. This year on the second weekend of last February, the *Digital Journal* sponsored the second **WW WPX RTTY** contest. Participation was up significantly from the previous year.

### *CONDITIONS*

As we near the bottom of the solar cycle contesting becomes more of a challenge. This year those entering had a year's experience under their belts and they knew that the action would be on 20 meters. With 40 and 80 adding double point bonuses of up to six points a QSO for off of the continent contacts.

Conditions were best Saturday and tapered off on Sunday. Lots of action on 40 meters world wide, and 80 was a great band in Europe. Europeans seem to enjoy 80 much more than do those of us who contest in Asia and North America.

### LOGS

We had an increase of almost 100 logs over the first contest and its pretty clear that the guys and gals are enjoying the format of the WPX. Some good DX was heard and worked during the contest with many stations having fun working VK9X, 5N, CN, ZS6, TY, XQ8, A8, V31.

The name of the game is RTTY contesting. It is an enigma. I hate it, I love it. I will never enter it again but if you call me I can be on the air in ten minutes. I am the world's best RTTY contester. I am the world's worst RTTY contester. I get every call on the screen. My gear always works great. My gear never works and my failing eye sight is even worse. My program and computer always work perfectly. My WF1B is always the wrong version. The deeper and deeper you go into the contest the more you learn that you don't know what you are doing, and realize that you have a lot to learn.

This year's contest was brought into focus for me through a single small log. My perspective has been changed forever.

One of our fellow contesters wrote these words.(I will paraphrase) "I bought the Hal P38 controller on Wednesday, I made the cables on Thursday, on Friday the WF1B software arrived, and on Saturday I entered my first RTTY contest, and made my very first RTTY QSO." Yes, the RTTY contest is a frustrating, egotistical, frivolous waste of time, and yes we all enjoy it.

The many logs from each of you show your enjoyment and that is what this is all about. Thanks! Its your log that makes the contest.

DX is starting to enter the contest and many more stations from South America were worked. An increased participation came from the Caribbean as well this year because of the changed dates. Stations in the Pacific are still far too scarce. We need to talk up the contest a bit more and get some 9M, 3D2, HL, BV, HS0, and stations down under on the air for this one.

This year again we had some very active stations that didn't submit logs at all. We still have a few in Eastern Europe that are unsure of the rules. So here's an idea. Why not send a copy of the WW RTTY WPX rules to each of those direct DX QSL's so they know when and where the action will be the following year. We will have the 1997 rules available by the time that you read this article. The only changes are to clarify a few rules.

### WE'RE RUNNING STRONG

This year was the year of the big score. That is one of the most interesting things about a fairly new contest. You never know just how much growth in scores, participation, and fun might come along. One of the nice things about QSO numbers is that you can keep track of the opposition in a serious effort. And what the heck, you can make a guy real happy as well with a 001. Its the 001's in a contest that make winners out of the " big gun" that you are working .

Here is the single band action for this year with four brand new records!

**SINGLE BAND - Plaque Winners**

| | | |
|---|---|---|
| 15 Meters: | PT2BW | 182,204 |
| 20 Meters: | S55T | 274,347 |
| 40 Meters: | PJ2MI | 343,200 |
| 80 Meters: | S51DX | 200,592 |

### 10 METERS

Ten meter activity remains very low as you would expect. However, this year we did have a single 10 meter entry. S52SK had the only 10 meter entry but wasn't awarded a plaque as the score and effort wasn't quite high enough. There was a smattering of contacts made in Asia on 10 as well. The 10 meter plaque will be waiting for someone next year or the year after ! But S52SK is now the all-time record holder on 10 meters.

### 15 METERS

Just like in many contests the north south path on 15 was open. This year brought a new record which eclipsed the old one by a huge margin. From Brazil, PT2BW was the plaque winner. With 8P6DU putting in a good showing from the Caribbean. We didn't have very many South Americans sending in logs but those that did pretty much won something in the various races. AB4PY was the top U.S. station. Peter TY1PS and YU1NR with OM3PR rounded out the single 15 entries.

### 20 METERS

On twenty meters there were a pack of entries and some stiff competition. We had over 25 single band 20 entries and five of them beat last years 20 record! Top gun on 20 was S55T operated by S55OO. He was followed by VE6JY, 9A8A, N4SR, CF7OR, WA7FAB, and F5TCN. Over 200 mults on the band was what separated the boys from the men.

### 40 METERS

The fine digital station and gentleman from Curracao, PJ2MI ruled the roost on 40 and eclipsed last years effort which was won from

the U.S. Second was IK1HSR with a strong entry. NF6L, and WF5E gave it a try from the U.S. as well. JA2NNF and SP3RBT were some 40 meter contesters from overseas. Once again the lowbands were very important to others for their big scores.

We no longer have to wonder about beating Barry on 40 as PJ2MI shows that the feat can be done! Now I guess Barry can try to reclaim the honor.

**80 METERS**

The race here was thought to be in the U.S. between Jim WU3V/5 and Jeff K1IU. But when the logs came in it changed quickly as S51DX submitted the winning and new record run, nearly a doubling of last years record. Second was S53MJ with the two U.S. stations chasing Europe.

Again records crumpled in the Low Power portion of the single operator class.

**SINGLE OPERATOR - LOW POWER**
**Plaque Winners**

| | | |
|---|---|---|
| World | AA5AU | 431,742 |
| Asia | 4X6UO | 265,421 |
| Europe | IV3FSG | 379,848 |
| N America | KA4RRU | 358,732 |
| USA | N1RCT | 340,480 |
| Oceania ZL2JON | 9,660 | |
| S. America | HK1LAQ | 12,576 |

In the Single Operator Low Power category, Don AA5AU, remained King of the Low Power Hill with his score of 431,742. Don eclipsed his own record of a year ago by 125,000 points. Don also uses two radios, which seems to be the only way to go if you want to be number one these days.

This year we had Elvira, IV3FSG with another big effort from Europe. She more than doubled last year's effort for the 2nd European plaque in a row. With better conditions on the high bands this will become an interesting category.

The top ten in low power remained a pretty constant group of competitors with a wide range of scores. The low power group is the largest class in the contest. We had our special "Rookie" of the contest from this class with A92GD winning the honors in a new plaque category.

**SPECIAL - Plaque Winners**

| | | |
|---|---|---|
| Rookie of 1996 | A92GD | 146,560 |
| Inspiration | DL7VOG | 235,128 |

A92GD was selected to receive the first "rookie" plaque by the members of the selection committee. He brought a special feeling to the contest and also made a number of people very happy.

DL7VOG was selected by the contest managers for an inspiring effort and a very good showing. While he entered in the high power class he actually ran low power. I want you to read the comments from this digital contester in the soapbox as it was one of the highlights of the contest to me.

**SINGLE OPERATOR - HIGH POWER**
**Plaque Winners**

| | | |
|---|---|---|
| WORLD | XQ8ABF | 712,963 |
| AFRICA | ZS6BRH | 134,149 |
| ASIA | UN5PR | 371,084 |
| JAPAN | JR5JAQ | 245,140 |
| EUROPE | UT0I | 598,388 |
| N AMER. | KE3Q | 708,178 |
| CANADA | VE7IN | 371,856 |
| USA | W2UP | 559,472 |
| OCEANIA | VK9XY | 272,412 |

Once again we have a batch of new records. In the Single Operator High Power category, XQ8ABF operating from Tierra Del Fuego took the honors with a new world record score of 712,963, in second place was Tyler, KF3P, operating KE3Q after a little trouble at the start. He repeated as North American top station. UT0I operated by UT2IZ repeated as top European with nearly a doubling of last years effort. UN5PR won Asia and I got him on the right continent this year. Barry, W2UP, got off that single band kick and won the U.S. trophy. A DXpedition by VK9XY made him a favorite and won him the Oceania plaque. JR5JAQ had a great score from Japan and eclipsed last years effort. From way down South Africa way came ZS6BRH with a nice score. VE7IN repeated with the top Canada score.

The Honorable Mention list were calls like SM3KOR number four overall, S59A, number five, I2EOW number six, K4HSF at the seventh spot, NR2H in at eight, NO2T in ninth and DJ6JC at twelve. These were all excellent efforts and finished ahead of some of the trophy winners.

**MULTI OPERATOR - SINGLE TRANSMITTER**
**Plaque Winners**

| | | |
|---|---|---|
| World | NP2DZ | 858,605 |
| Asia | RK9CWA | 703,768 |
| Europe | GW8GT | 572,397 |
| N. America | AB5KD | 820,800 |
| USA | AF4Z | 375,606 |
| Oceania | VK6GOM | 196,824 |

In the Multi Operator Single Transmitter category, the crew of NP2DZ, KP2N, and NP2E has been making big noise. Top honors and the new World Record went to this able group. Close behind was AB5KD and WF1B winning the North American trophy from W5KFT's ranch QTH and big station. RK9CWA, Serge and Mike made another run for the top. But this year the propagation in the northern latitudes was too much to overcome so they settled in with a third place finish. Europe was well represented and a fine effort by the GW8GT contest duo put them first in Europe for the trophy. VK6GOM again got the honors for Oceania. From the U.S. came a great effort from AF4Z, which beat last year's U.S. record.

**MULTI OPERATOR - MULTI TRANSMITTER**
**Plaque Winners**

| | | |
|---|---|---|
| World | OI3NE | 399,378 |
| Europe | GW8GT | 572,397 |

Well all I can say is that I tried. This class had an interesting and very tight race. All the entries were from Europe. There was a new European Record set which totally annihilated last years record. But not a single station from the first year entered again in 1996. Several plaques went unclaimed and may not be again issued unless competition increases in this class. The battle in 1996 was between Finland and Lithuania with the winner just edging out in QSO's but with a big lead in mults. SQ5O also put in a good showing from Europe for third place in the M/M.

This is my last year as Contest Director and its time to move along and let Ron, AB5KD take the main chair. One of our goals was to get the contest off to a good start and then to start bringing in some other people of help.

This year a number of others have been actively involved. This year we had additional help in log checking from both Ron and Don, AA5AU. Ron checked the Low Power Logs and Don checked the High Power logs.

Ron has announced that next year, yet another venerable contester, Eddie W6/G0AZT will join the effort. I will remain to help Ron in whatever small way that I can while he shoulders the brunt of the load. Next years logs go to Ron.

As Ron is so famous for saying:

*"Words of Wisdom" — If you live north of the 40th then the best bet is to wait another two years...because the bands will return with a bang! . . . .73 de Jay WS7I*

# 1996 World Wide WPX Contest Scores

## Africa

**Benin**

| | | | | | |
|---|---|---|---|---|---|
| TY1PS | 8,500 | 71 | 170 | 50 | S15 |

**South Africa**

| | | | | | |
|---|---|---|---|---|---|
| ZS6BRH | 134,149 | 249 | 823 | 163 | S/H |

## Asia

**Asiatic Russia**

| | | | | | |
|---|---|---|---|---|---|
| RK9CWA | 703,768 | 660 | 2,626 | 268 | M/S |
| UA0JQ | 133,444 | 271 | 914 | 146 | S/H |

**Bahrain**

| | | | | | |
|---|---|---|---|---|---|
| A92GD | 146,560 | 291 | 916 | 160 | S/L |

**Hong Kong**

| | | | | | |
|---|---|---|---|---|---|
| VS6BG | 44,368 | 173 | 472 | 94 | S/H |

**Japan**

| | | | | | |
|---|---|---|---|---|---|
| JR5JAQ | 245,140 | 340 | 1,190 | 206 | S/H |
| JA5EXW | 242,352 | 327 | 1,188 | 204 | S/H |
| JH7QXJ | 69,596 | 186 | 548 | 127 | S/H |
| JE2UFF | 63,837 | 168 | 519 | 123 | S/L |
| JA7KBR/1 | 38,502 | 129 | 414 | 93 | S/L |
| JA2BY | 35,511 | 124 | 399 | 89 | S/L |
| JA1AYC | 30,846 | 117 | 318 | 97 | S20 |
| JR2BNF/1 | 28,858 | 109 | 307 | 94 | S20 |
| JR3QOV | 8,900 | 60 | 178 | 50 | S/L |
| JA7SUR | 7,308 | 52 | 174 | 42 | S/L |
| 74JH3WKE | 5,490 | 49 | 122 | 45 | S/L |
| JA1SJV | 4,884 | 40 | 132 | 37 | S/L |
| JA2KPV | 4,636 | 41 | 122 | 38 | S/L |
| JA2NNF | 2,736 | 24 | 114 | 24 | S40 |
| JI1WDW | 1,656 | 24 | 72 | 23 | S/L |
| JR3QOV | 8,900 | 60 | 178 | 50 | S/L |

**Kazakhstan**

| | | | | | |
|---|---|---|---|---|---|
| UN5PR | 371,084 | 461 | 1,828 | 203 | S/H |

**Israel**

| | | | | | |
|---|---|---|---|---|---|
| 4X6UO | 265,421 | 403 | 1,201 | 221 | S/L |

## Europe

**Belgium**

| | | | | | |
|---|---|---|---|---|---|
| ON6AM | 74,675 | 229 | 515 | 145 | S/L |

**Bulgaria**

| | | | | | |
|---|---|---|---|---|---|
| LZ1BJ | 203,098 | 386 | 1,246 | 163 | S/H |
| LZ2MP | 33,166 | 134 | 322 | 103 | S20 |
| LZ1MC | 13,416 | 63 | 258 | 52 | S80 |
| LZ3CW | 260 | 11 | 26 | 10 | S/H |

**Croatia**

| | | | | | |
|---|---|---|---|---|---|
| 9A8A | 257,868 | 387 | 1,044 | 247 | S20 |

**Czech Republic**

| | | | | | |
|---|---|---|---|---|---|
| OK1MR | 155,376 | 286 | 936 | 166 | S/H |
| OK2PAD | 51,788 | 151 | 484 | 107 | S/L |
| OK2FD | 35,200 | 105 | 440 | 80 | S80 |
| OK2SG | 29,670 | 110 | 345 | 86 | S/L |
| OK1MCA | 24,360 | 88 | 348 | 70 | S80 |

**Denmark**

| | | | | | |
|---|---|---|---|---|---|
| OZ8RO | 104,104 | 215 | 676 | 154 | S/H |
| OZ7XE | 35,640 | 151 | 324 | 110 | S/L |
| OZ5MJ | 9,291 | 60 | 163 | 57 | S/L |

**England**

| | | | | | |
|---|---|---|---|---|---|
| G0LII | 93,184 | 224 | 728 | 128 | S/L |

**European Russia**

| | | | | | |
|---|---|---|---|---|---|
| RW1F | 5,510 | 92 | 145 | 38 | S/L |

**Finland**

| | | | | | |
|---|---|---|---|---|---|
| OI3NE | 399,378 | 540 | 1,554 | 257 | M/M |
| OH2LU | 307,780 | 484 | 1,399 | 220 | S/H |
| OI2GI | 269,019 | 425 | 1,263 | 213 | S/H |
| OI2BP | 253,411 | 434 | 1,201 | 211 | S/H |

**France**

| | | | | | |
|---|---|---|---|---|---|
| F5TCN | 119,796 | 251 | 673 | 178 | S20 |

**Germany**

| | | | | | |
|---|---|---|---|---|---|
| DJ6JC | 370,004 | 447 | 1,588 | 233 | S/H |
| DL7VOG | 235,128 | 349 | 1,164 | 202 | S/H |
| DL9GGA | 62,300 | 175 | 623 | 100 | S/L |
| DJ9XB | 40,641 | 130 | 437 | 93 | S/L |
| DL8UCC | 30,855 | 110 | 363 | 85 | S/H |
| DJ1OJ | 30,295 | 118 | 365 | 83 | S/L |
| DL5PW | 29,568 | 111 | 352 | 84 | S/L |
| DF5BX | 27,825 | 109 | 371 | 75 | S/L |
| DL1ARJ | 17,810 | 80 | 274 | 65 | S/L |
| DL1ET | 16,932 | 83 | 249 | 68 | S/L |
| DJ6WC | 10,175 | 64 | 185 | 55 | S/L |
| DL2AL | 8,722 | 70 | 168 | 52 | S/L |
| DL1DQJ | 360 | 13 | 30 | 12 | S20 |

**Hungary**

| | | | | | |
|---|---|---|---|---|---|
| HAM5BSW | 105,118 | 246 | 622 | 169 | S20 |

**Italy**

| | | | | | |
|---|---|---|---|---|---|
| I2EOW | 464,324 | 545 | 1,442 | 322 | S/H |
| IK2BUF | 463,848 | 517 | 1,849 | 251 | M/S |
| IV3FSG | 379,848 | 468 | 1,596 | 238 | S/L |
| I2UIY | 300,960 | 424 | 1,320 | 228 | S/H |
| IK0HBN | 242,580 | 335 | 1,244 | 195 | S/H |
| IK2HKT | 213,860 | 343 | 1,156 | 185 | S/H |
| IK1HSR | 126,540 | 270 | 666 | 190 | S40 |
| I2HWI | 121,483 | 244 | 794 | 153 | S/L |
| IK7YUA | 68,819 | 194 | 629 | 111 | S/L |
| I2UIY | 66,568 | 153 | 628 | 106 | S80 |
| IK1TWC | 65,208 | 159 | 494 | 132 | S/L |
| I4GHW | 59,474 | 187 | 454 | 131 | S20 |
| IK3ASM | 35,616 | 132 | 425 | 84 | S/L |
| I8BVW | 7,644 | 47 | 182 | 42 | S/L |
| IK2AUK | 5,772 | 48 | 148 | 39 | S/L |
| IK4QIB | 5,560 | 44 | 139 | 40 | S/L |
| IK7WPD | 4,699 | 47 | 127 | 37 | S/L |
| I7ICU | 3,663 | 42 | 111 | 33 | S/L |
| IK2REA | 3,052 | 38 | 109 | 28 | S/L |
| IT9ORA | 1,173 | 23 | 51 | 23 | S20 |
| IK2XYU | 800 | 22 | 40 | 20 | S20 |
| IK7XLW | 656 | 18 | 41 | 16 | S/L |

**Latvia**

| | | | | | |
|---|---|---|---|---|---|
| YL2KF | 32,116 | 124 | 434 | 74 | S/L |

**Lithuania**

| | | | | | |
|---|---|---|---|---|---|
| LY1BZB | 393,651 | 532 | 1,719 | 229 | M/M |
| LY2CG | 15,862 | 94 | 206 | 77 | S20 |

**Netherlands**

| | | | | | |
|---|---|---|---|---|---|
| PA3EVY | 9,512 | 61 | 156 | 58 | S20 |

**Norway**

| | | | | | |
|---|---|---|---|---|---|
| LA7AJ | 82,410 | 201 | 670 | 123 | S/H |
| **Poland** | | | | | |
| SQ5O | 135,568 | 268 | 916 | 148 | M/M |
| SP8CNS | 44,361 | 142 | 477 | 93 | S/L |
| SP2EIW | 43,524 | 124 | 403 | 108 | S/L |
| SP9LKS | 24,000 | 145 | 480 | 50 | S/L |
| SP2FAV | 16,464 | 101 | 343 | 48 | S/L |
| SP3FAR | 10,034 | 64 | 173 | 58 | S20 |
| SP2LNY | 9,553 | 76 | 233 | 41 | S/L |
| SP5GRU | 6,437 | 49 | 157 | 41 | S/L |
| SP2GNB | 5,612 | 53 | 122 | 46 | S20 |
| SP8FHJ | 5,254 | 39 | 142 | 37 | S/L |
| SP6CYV | 3,864 | 43 | 168 | 23 | S80 |
| SP3RBT | 780 | 15 | 60 | 13 | S40 |
| SP2UUU | 288 | 12 | 24 | 12 | S20 |
| **Romania** | | | | | |
| YO3FRI | 79,233 | 281 | 539 | 147 | S/H |
| YO5KAI | 18,023 | 90 | 269 | 67 | S/L |
| **Slovak Republic** | | | | | |
| OM3PR | 377 | 15 | 29 | 13 | S15 |
| **Slovenia** | | | | | |
| S59A | 539,274 | 568 | 1,866 | 289 | S/H |
| S56A | 280,790 | 414 | 1,306 | 215 | S/H |
| S55T | 274,347 | 423 | 1,129 | 243 | S20 |
| S51DX | 200,592 | 278 | 1,194 | 168 | S80 |
| S53MJ | 154,500 | 250 | 1,030 | 150 | S80 |
| S53BB | 105,000 | 235 | 750 | 140 | S/L |
| S57NXX | 53,064 | 131 | 536 | 99 | S80 |
| S57C | 46,866 | 146 | 438 | 107 | S/L |
| S57KM | 41,032 | 128 | 446 | 92 | S/L |
| S52SK | 91 | 8 | 13 | 7 | S10 |
| **Spain** | | | | | |
| EA7ADH | 63,506 | 191 | 562 | 113 | S/L |
| EA3AOK | 46,696 | 132 | 249 | 104 | S/H |
| EA2BNU | 38,024 | 137 | 388 | 98 | S/L |
| EA4BNQ | 5,520 | 50 | 115 | 48 | S20 |
| EA1BLF | 704 | 16 | 44 | 16 | S/L |
| EA1DLN | 630 | 15 | 42 | 15 | S/L |
| **Sweden** | | | | | |
| SM3KOR | 583,745 | 640 | 1,865 | 313 | S/H |
| SM4CMG | 313,686 | 437 | 1,413 | 222 | S/H |
| SM5FUG | 288,971 | 411 | 1,273 | 227 | S/H |
| SM4RGD | 163,700 | 290 | 1,195 | 140 | S/L |
| SM7BHM | 102,236 | 212 | 838 | 122 | S/L |
| SM4RGD | 57,780 | 156 | 642 | 90 | S80 |
| SM4DHF | 33,189 | 126 | 299 | 111 | S20 |
| SM5EIT | 29,670 | 112 | 345 | 86 | S/H |
| SM3LBP | 29,106 | 133 | 297 | 98 | S20 |
| SM7BGE | 2,890 | 39 | 85 | 34 | S/L |
| **Ukraine** | | | | | |
| UT0I | 598,388 | 709 | 2,107 | 284 | S/H |
| US9QA | 133,600 | 337 | 523 | 160 | S/H |
| US6H | 49,642 | 178 | 404 | 123 | S80 |
| UT5I | 37,848 | 113 | 456 | 83 | S80 |
| UT6I | 16,720 | 100 | 209 | 80 | S20 |
| UT4PR | 7,840 | 110 | 196 | 40 | S/L |
| EM2I | 4,865 | 40 | 139 | 35 | M/S |
| **Wales** | | | | | |
| GW8GT | 572,397 | 613 | 1,967 | 291 | M/S |
| GW4KHQ | 154,171 | 304 | 1,021 | 151 | S/L |
| GW0ANA | 123,648 | 279 | 896 | 138 | S/L |
| **Yugoslavia** | | | | | |
| YU7AM | 171,873 | 318 | 1,017 | 169 | S/L |
| YU7AE | 68,186 | 191 | 662 | 103 | S/L |
| YU1BO | 26,775 | 109 | 357 | 75 | S/L |
| YU1NR | 7,488 | 60 | 144 | 52 | S15 |

## North America

| | | | | | |
|---|---|---|---|---|---|
| **Alaska** | | | | | |
| AL7BB | 50,255 | 167 | 437 | 115 | S/H |
| **Belize** | | | | | |
| V31JU | 305,140 | 507 | 1,387 | 220 | S/L |
| **Canada** | | | | | |
| VE7IN | 371,856 | 563 | 1,524 | 244 | S/H |
| VE3FJB | 331,023 | 454 | 1,433 | 231 | M/S |
| VE6JY | 261,522 | 452 | 1,002 | 261 | S20 |
| CF7OR | 137,750 | 327 | 725 | 190 | S20 |
| VE6KRR | 128,438 | 323 | 862 | 149 | S/L |
| CF6FR | 116,229 | 306 | 731 | 159 | S/L |
| VE6ZX | 104,407 | 278 | 797 | 131 | S/L |
| VE2AXO | 55,440 | 166 | 495 | 112 | S/L |
| CF7CFD | 47,432 | 184 | 484 | 98 | S/L |
| VE3XAG | 12,375 | 70 | 225 | 55 | S/L |
| VE3EVV | 9,312 | 63 | 194 | 48 | S/L |
| VE2BOB | 6,574 | 54 | 173 | 38 | S/L |
| VE5SF | 2,788 | 40 | 82 | 34 | S/L |
| VE2FFE | 2,088 | 30 | 72 | 29 | S/H |
| VE3VET | 297 | 13 | 27 | 11 | S20 |
| **Barbados** | | | | | |
| 8P6DU | 25,474 | 122 | 271 | 94 | S15 |
| **United States** | | | | | |
| AB5KD | 820,800 | 1,051 | 2,280 | 360 | M/S |
| KE3Q | 708,178 | 832 | 2,234 | 317 | S/H |
| W2UP | 559,472 | 705 | 1,916 | 292 | S/H |
| AA5AU | 431,742 | 742 | 1,531 | 282 | S/L |
| K4HSF | 418,295 | 715 | 1,555 | 269 | S/H |
| NR2H | 414,680 | 592 | 1,481 | 280 | S/H |
| NO2T | 397,574 | 639 | 1,451 | 274 | S/H |
| AF4Z | 375,606 | 668 | 1,386 | 271 | M/S |
| KA4RRU | 358,732 | 589 | 1,364 | 263 | S/L |
| N1RCT | 340,480 | 580 | 1,280 | 266 | S/L |
| N2FF | 333,829 | 522 | 1,241 | 269 | S/H |
| W7LZP | 313,690 | 683 | 1,235 | 254 | S/H |
| KD8FS | 313,500 | 580 | 1,254 | 250 | S/L |
| WA7FOE | 312,997 | 674 | 1,247 | 251 | S/H |
| K2NJ | 303,666 | 506 | 1,177 | 258 | S/L |
| WG9B | 275,520 | 488 | 1,120 | 246 | S/H |
| WA2UKP | 265,608 | 469 | 1,054 | 252 | M/S |
| N6GG | 262,892 | 558 | 1,148 | 229 | S/H |
| WB7AVD | 256,824 | 629 | 1,107 | 232 | S/H |
| KJ7TH | 256,608 | 507 | 1,188 | 216 | S/H |
| WB8YTZ | 253,929 | 374 | 1,149 | 221 | S/L |
| KN6DV | 241,904 | 525 | 1,163 | 208 | S/L |
| WA0ACI | 234,792 | 580 | 1,087 | 216 | S/H |
| N4SR | 224,672 | 412 | 944 | 238 | S20 |
| N9CKC | 217,425 | 476 | 975 | 223 | S/L |
| N2CQ | 212,205 | 364 | 987 | 215 | S/H |
| WB0BLR | 208,780 | 464 | 949 | 220 | S/H |
| KA1SIE | 206,944 | 384 | 928 | 223 | S/L |
| AI7B | 205,303 | 566 | 973 | 211 | S/H |
| WA7FAB | 200,669 | 462 | 763 | 263 | S20 |
| K4GMH | 173,900 | 403 | 925 | 188 | S/L |
| AA3EV | 172,016 | 364 | 827 | 208 | S/L |
| K0RC | 164,920 | 420 | 868 | 190 | S/H |
| WA6VZI | 150,535 | 440 | 805 | 187 | S/L |
| WA6SDM | 145,668 | 436 | 796 | 183 | S/H |
| WA4ZXA | 144,144 | 346 | 792 | 182 | S/L |
| K2WK | 137,802 | 300 | 714 | 193 | S/H |

| | | | | | |
|---|---|---|---|---|---|
| WA4JQS | 137,370 | 309 | 723 | 190 | S/L |
| WU3V/5 | 137,016 | 301 | 792 | 173 | S80 |
| K1IU | 132,354 | 266 | 774 | 171 | S80 |
| W5TZN | 124,410 | 418 | 754 | 165 | S/L |
| KI4MI | 113,230 | 290 | 670 | 169 | S/L |
| N1OAZ | 110,250 | 314 | 630 | 175 | S/H |
| N1JIT | 105,230 | 274 | 619 | 170 | M/S |
| KF2OG | 89,517 | 266 | 563 | 159 | S/L |
| K8UC | 86,715 | 259 | 615 | 141 | S/L |
| WY6/G0AZT | 79,920 | 302 | 540 | 148 | S/L |
| AE0Q | 78,638 | 315 | 574 | 137 | M/S |
| KD6TO | 77,380 | 302 | 530 | 146 | S/H |
| NF6L | 68,392 | 188 | 522 | 131 | S40 |
| N9GEU | 62,853 | 245 | 511 | 123 | S/L |
| AA2GS | 62,270 | 200 | 479 | 130 | S/L |
| NA2M | 61,364 | 209 | 529 | 116 | S/H |
| KD2YG | 60,915 | 207 | 465 | 131 | S/L |
| N9OKD | 57,980 | 203 | 446 | 130 | S/L |
| K2UF | 56,448 | 197 | 448 | 126 | S/L |
| KA2CYN | 55,800 | 195 | 465 | 120 | S/L |
| WA2WYR | 50,578 | 174 | 418 | 121 | S/H |
| N7UJJ | 49,731 | 242 | 411 | 121 | S/L |
| WB8ZTY | 49,056 | 205 | 438 | 112 | S/L |
| AA5VN | 48,700 | 202 | 487 | 100 | S/L |
| K0BX | 47,212 | 156 | 407 | 116 | S/L |
| K7DSR | 46,816 | 220 | 352 | 133 | S/H |
| WB5B | 46,575 | 187 | 405 | 115 | S/H |
| WF5E | 44,308 | 147 | 418 | 106 | S40 |
| KC7MJ | 44,308 | 221 | 418 | 106 | S/L |
| K9RRB | 40,680 | 180 | 360 | 113 | S/L |
| W4JLS | 39,936 | 175 | 384 | 104 | S/L |
| KA3DSX | 38,626 | 135 | 434 | 89 | S/L |
| W6OTC | 37,422 | 153 | 378 | 99 | S/L |
| KC1YF | 37,074 | 150 | 334 | 111 | S/L |
| KC4SAW | 34,848 | 133 | 396 | 88 | S/L |
| ND8L | 34,068 | 155 | 334 | 102 | S/H |
| W2JGR/0 | 33,900 | 185 | 300 | 113 | S/L |
| N5MTS | 29,939 | 177 | 329 | 91 | S/L |
| KA8OUT | 22,720 | 101 | 284 | 80 | S/L |
| AA6TY | 22,525 | 154 | 265 | 85 | S/L |
| N2HOS | 21,736 | 114 | 247 | 88 | S/L |
| AE4EY | 21,590 | 125 | 254 | 85 | S/H |
| W4IF | 21,394 | 105 | 264 | 81 | S/H |
| WA1EHK | 19,434 | 101 | 246 | 79 | S/L |
| KF4BU | 17,017 | 100 | 221 | 77 | S/H |
| AB4PY | 16,920 | 111 | 188 | 90 | S15 |
| N3II | 16,848 | 100 | 216 | 78 | S/L |
| KG5IT | 16,555 | 132 | 215 | 77 | S/L |
| KG7DK | 14,910 | 117 | 210 | 71 | S/L |
| WA0BNX | 13,632 | 102 | 192 | 71 | S/L |
| W4/WP2S | 13,300 | 97 | 190 | 70 | S/L |
| N1AU | 13,132 | 81 | 196 | 67 | S/H |
| KB9KWL | 12,672 | 101 | 192 | 66 | S/L |
| AK0A | 12,642 | 123 | 147 | 86 | S20 |
| KK4DK | 10,230 | 85 | 165 | 62 | S/L |
| WS7I | 10,000 | 97 | 125 | 80 | S/L |
| WA5IZE | 9,135 | 81 | 145 | 63 | S/L |
| W3FTG | 9,072 | 84 | 168 | 54 | S/L |
| AA9PZ | 8,176 | 74 | 146 | 56 | S/L |
| N0IBT | 7,381 | 75 | 121 | 61 | S/L |
| WB4UBD | 6,255 | 50 | 139 | 45 | S20 |
| W8IDM | 5,945 | 57 | 145 | 41 | S/L |
| WA0TDQ | 5,865 | 70 | 115 | 51 | S/L |
| KE4GI | 5,192 | 58 | 118 | 44 | S/L |
| KC7LKN | 2,706 | 40 | 82 | 33 | S20 |
| W3FQE | 1,134 | 21 | 63 | 18 | S/L |
| KS4YX | 1,102 | 22 | 58 | 19 | S/L |
| AA1CB | 1,002 | 50 | 81 | 42 | S/L |
| AC6LS | 884 | 36 | 68 | 13 | S/L |
| K8OSF | 714 | 22 | 34 | 21 | S15 |
| KQ4QM/8 | 100 | 5 | 20 | 5 | S40 |
| N0KDI | 726 | 25 | 33 | 21 | S/L |
| K7EX | 80 | 8 | 10 | 8 | S20 |
| **Virgin Islands** | | | | | |
| NP2DZ | 858,605 | 940 | 2,563 | 335 | M/S |

## Oceania

| | | | | | |
|---|---|---|---|---|---|
| **Australia** | | | | | |
| VK6GOM | 196,824 | 317 | 1,112 | 177 | M/S |
| VK4/VK9NH | 87,010 | 203 | 791 | 110 | S/H |
| **Christmas Island** | | | | | |
| VK9XY | 272,412 | 427 | 1,449 | 188 | S/H |
| **New Zealand** | | | | | |
| ZL2AMI | 27,200 | 87 | 400 | 68 | S/H |
| ZL2JON9,660 | 70 | 276 | 35 | S/L | |

## South America

| | | | | | |
|---|---|---|---|---|---|
| **Brazil** | | | | | |
| PT2BW | 182,204 | 306 | 912 | 202 | S15 |
| **Chile** | | | | | |
| XQ8ABF | 712,963 | 660 | 2,467 | 289 | S/H |
| CE8SFG | 59,000 | 160 | 472 | 125 | S20 |
| **Columbia** | | | | | |
| HK1LAQ | 12,576 | 67 | 262 | 48 | S/L |
| **Netherland Antilles** | | | | | |
| PJ2MI | 343,200 | 295 | 1,760 | 195 | S40 |

**Check Logs:**
KE5BK,VK3EBP,KJ4TK,WV7Y,K9EMG,YO3CDN,HC5K,DL 7DQJ

**Operators:**
Multi-Operators:
OI3NE: OH3'S FM, KLG, LQK, NLP, MEP, MFP, MMF, MMH, MYD
LY1BZB: LY2BKF, KL1FF, LY3NFW, LY2BIL
SQ5O: SP5IUK, SP5SSN, SP5SST, SP5TAZ, SP5VYI, SQ5AWS, SQ5AWI
AB5KD: AB5KD, WF1B
AE0Q: AE0Q, KI7RW
AF4Z:
AF4Z,A4VQD,KC4HW,AD4TG,N4IJ,WA4HDS,KT4FY,KT4DI ,W3ZMB,AA4FC
EM2I: UT2IA, UT2IO, UR3IMM
GW8GT: GW5NF, GW4JBQ
IK2BUF: IK2BUF, IK2SGF, IK2ZJJ, I2GXS
N1JIT: N1JIT, N1JEB
NP2DZ: NP2DZ, KP2N, NP2E
RK9CWA: UA9CGA, RW9CF
VE3FJB: VE3FJB, VE3ABG, VE3VSM, VE3IJM, VE3MKX, VA3CW, VE3NDA
VK6GOM: VK6GOM, VK6APW
WA2UKP: WA2UKP

**Single Operators**:
CF6FR VE6FR
CF7CFD VE7CFD
KE3Q KF3P
OI2BP OH2BP
S55T S55OO
US6H UR0HQ
UT0I UT2IZ

# Membership Survey Results

**by Jim Mortensen, N2HOS**

Like the Internal Revenue Service, I know a lot about you and your habits and, as the IRS seems to do on occasion, I am going to pass the information along to a lot of interested people. Oh, we aren't going to discuss your income or those questionable deductions taken for that trip to Dayton last year. Nor will be reveal the amount of that little item called 'green stamps' listed in your contribution deduction taken over the past several years. No, we are going to stick to the facts as you reported them.

For example, the Digital Journal world should know that you were licensed on July 1, 1963. You then tinkered with those other modes for 12.5 years before you finally did the right thing and made your first HF digital contact on January 1, 1976 (probably because you wanted to celebrate the country's bicentennial by trying something new). Your first contact was made in RTTY, and RTTY remains your mode of choice to this date, over twenty years later. Believe it or not, you spend 75% of your on-air time listening to or sending the Beedle Beedle sounds. Oh yes, you do spend some time with the other digital modes, including strange things like CW and SSB, but you generally get right back to the mode you like the best.

But those are the facts you would tell anybody. No mysteries so far. Now let's get to the inside, those juicy secrets that nobody is supposed to know about. Let me drop the bomb right off the bat. Your second most-favorite mode is CW! (Yes, I said Charlie Whiskie!). I do promise not to tell anybody else about that one. Some of the friends you meet on the air even prefer that mode over all others, if you can believe that story. Of course, some older and wiser folks tell me that CW is a digital mode anyway and besides, a good chunk of CW is now sent and received by computer. But I don't know much about that darker side of your story.

I also know that you would rather chase DX than members of the 'other' gender. Although random keyboard QSO's are important to you, down deep DX comes first. Your country count of 177 is not of historical dimensions, but you keep working away at the score. Given some propagation tail wind, that count is going to jump in a hurry. I add that note, because I know you have a beam antenna in addition to all those wires and stick antennas out there in the back yard.

During the time you were supposed to be doing those oft-delayed weekend chores, the records report that you entered seven contests last year. You did this even though you don't take contesting too seriously. Even so, you have a strong preference for the CQWW, the ARRL Roundup and the new WPX contest. Since I didn't want to embarrass you I kept the score information secret (at least for now).

No one else in your household understands all the gear in your shack, but you have done an incredible job of justifying your need for computer power to support all your secret activities. It is common knowledge that you have a 486/66 computer with lots of RAM and hard disk space. And everybody knows that ever since you first owned a computer back in 1987, you have upgraded speed and power at every chance (and maybe at every hamfest). Heck we even know about the softer side of the equation, too. You use Win3.1 and are upgrading to Win95 at the first chance. WF1B's RTTY, Express and PC Packratt are your favorite programs, but you probably run something like Quicken to justify the computer investment. Right? Oh, you use other programs as well, like Hostmaster, BMKmulty, HAL (for Clover) and LanLink, but you don't change very frequently.

++++++++++++

If you fit the above description completely, down to the last detail, please get in touch with me at once. Why? Because I would like to meet the person who is exactly the 'average' member of IDRA. Such an individual might exist, at least in theory, but I somehow doubt my phone will ring soon. Hi! In the first place, this is a composite of only those members who took the time to fill out the questionnaire. While it is true that our response rate was above expectations, there could well be a difference between those who fill out forms and those who don't. Maybe the non-responders have different interests; got aboard the digital bandwagon on a different path and at a different time; like some obscure activity better than plain keyboarding for DX or ragchewing; and might even prefer SSB to digital activity. I doubt any of this is true but we must peek at the evidence in hand with that proviso. With that qualification in mind, here is a look at you, based solely on what you said and presumably meant at the time you submitted the form.

Yes, on average, you were licensed in mid-1963 (the earliest in 1932 and the latest in 1995). This single statistic suggests that, on balance, we are a rather experienced group of operators. Interesting, to be sure, but not nearly as much as some other facts related to date-of-licensing. For reasons known only to the individuals involved, it took a long time to graduate from the entry modes, presumably SSB or CW. On average, we spent 12.5 years in the wilderness before making that first HF digital contact!

There is a clear pattern here, however. For those early licensees, this gap was between 30 and 50 years. For those licensed in the 80's, on the other hand, the gap was about two years. We assume this traces principally to the presence of that infernal machine, the personal computer, in our households after 1987 (and some much earlier, even into the 70's). Chances are that most new licensees interested in any of HF modes would fall into that category today. This could mean that digital forms of communication could well become the preferred mode at or near the time of entry into the world of HF radio.

To an overwhelming extent, RTTY was the mode used on the first contact at HF (Amtor 6%, Clover and Pactor 2% each). And to a surprising extent, RTTY remains the favorite mode today. Two-thirds of you continue to prefer it as your preferred mode. But I would never have guessed the next entry. While RTTY is the favorite of two thirds of us CW is the first choice of 16% of our members, Pactor 12%, Clover 8% and Amtor 2%. And if that didn't get your attention, CW lives as the second 'favorite' mode in 16% as well (34% Pactor, 8% Clover and 2% Amtor). Implied in those numbers is the fact that about one-third of us use a lot of CW. G-Tor has been tried by about 10% of the group but doesn't make anybody's favorite list. Pactor II has not been tried by any of the respondents.

The CW usage is no doubt related to our favorite activity. In first place by a decent margin (46% to 38%) 'chasing DX' is more popular than 'random' contacts. While not projectable, many of the submitted forms included details of DX accomplishments. They tended to show heavy SSB and CW country counts as well as digital. There is a considerable number of 'Mixed, Phone and CW' Honor Roll stars in our midst, and several near-Honor Roll in the digital category. So it would appear that while digital is the normal mode, DX transcends the question of modes. DX is important regardless of mode.

Contesting is universal in that virtually all of us enter one or more contests during the year (the average is seven). But, it is a peripheral interest for most of us. About 20%, however, consider contest-

ing as their primary activity (and their station equipment lineup proves their point!). They are a dedicated bunch, to say the least. They significantly outnumber the remaining interest groups, those who lurk in and around BBSs or work MARS and so on. Favorite contests were CQWW 20%, Roundup 18%, WPX 14% and SARTG 6% plus a host of all others (including some CW and SSB tests). CQWW was picked primarily for the presence of a lot of DX, which ties back to our primary interest.

Computer power is rampant in this group. A mid-range 486 is about the average, although it is difficult to be precise because of variations in definitions. But think about this—there are about as many Pentiums as there are 386's! The broad middle group has the 486. Oh, there are a few 286's, a couple of 8088's and even a C64, but it can safely be said that computer horsepower is not an issue here. Over 75% have 486 power or above. Mac's account for about 4% of the total, by the way, far short of their normal share of market.

Operating system usage is less uniform. About 30% still use DOS as the primary operating system. While outnumbered by the Win3.1 tribe, which checks in with a first place 40%, they continue to be a significant part of the group. Win95 is stronger than anticipated at about 25% with the remaining 5% split between OS/2 and MAC. Since about two-thirds of us use Windows 3.X or better, memory and hard disk space is not a common problem. Disks up to two gigs are quite common.

Software is the most diverse of all, but it is understandable considering the multiple hardware configurations and interests of the users. The potential combinations are endless. WF1B RTTY is the most popular software mentioned with 44% using it. Obviously popular because of its contest excellence ( and contesting's related DX potential), this is the closest thing we have to a common language. Next, there is a tie between Express 3.X and PackRatt. About 25% list each of these multi-mode packages, one largely tied to the increasingly popular P38 from HAL, the other to what might be described as the 'basic' digital setup. Then comes Hostmaster for the KAM crowd at about 15%, BMKmulty at 12%, tied with the HAL software (furnished with the PCI4K and P38), and then LanLink and XP ware (of different varieties) at about 10%. OH2GI's contesting software and KE5HE's RagChew each came in at about the 4% level.

Do you like the Digital Journal? Yes, almost universally. On a scale of 1-10 (with ten being totally out of this world), we rank a consistent 8. On the low end we get a three because the operator claims to join up only because of the hospitality suite. (I'm not sure but I think his callsign is a pirate). On the high end we get a nine plus, simply because a perfect ten 'would go to our head.' No complaints on that score. Quite the contrary. It is a wonderful tribute to those volunteer columnists who, month in and month out, dig up the ideas and tests and graphics and reviews and stories; then wrap them up in understandable and enjoyable language. We applaud them. We thank them for we couldn't ever begin to do this job without their unstinting support.

You like most or all of the magazine. Of course the DX and contest sections get high marks. All the columnists (W2JGR, N6GG, AA5AU, W6OTC and AB5KD) get very special mention. Product reviews (W1VXV) of any sort are way up on the list. Technical discussions of any sort are popular, particularly *dsp* (Doug KF4KL and, earlier, Paul W4ZB and Steve N2QCA). Across the Pond (ON9CNC) is a favorite. CCW and Satellites (G3IRM and KI6QE respectively) draw some votes as well. Heck, even the editor got a mention or two for the Last Word. In truth, most members like it all. They revel in its depth. The common denominator is DIGITAL, a subject either treated lightly or not at all by any other magazine. It is the thread that holds us together as a community.

Interestingly, some say they want less Internet, some say more. But all say, in one way or another, that they want more information of a tutorial nature. "How to do XXX," that is the choice subject of them all. And we will try to comply as we move on into the 45th year of publication. We will try to enlarge the number of digital adventurers, try to ease the pain of entry, try to enlarge each individual's portfolio of options, try to make the magazine as interesting and fun as the digital modes themselves. That's our challenge and we look forward to another 45 years of it!

Thanks to everybody, on all continents and in many countries, for participating. Your faxes and the letters and the E-mails were very much appreciated. We trust the report is as interesting to you as it is to me and the staff of the Digital Journal.

*73 de Jim N2HOS*

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# Packet Power

**Tips for the new and seasoned packet user**

*by Dave Wolf, WO5H dba Maingate Resources*
*P.O. Box 189, Burleson TX 76097-0189 / CompuServe ID: 73427,2246*

## A Little Texas Bragging

With Dayton just behind us, thoughts are on other hamfests about the country. Other chances for folks to get together, like they did at Dayton at the IDRA meetings. For me, the big hamfest in my 'neck of the woods' is HamCom in Arlington, Texas. This is in the middle of the Dallas/Fort Worth "Metroplex" in north-central Texas. I've been working on several key events for HamCom since Fall of last year. You see, I am the president of the largest regional digital organization in the country, the Texas Packet Radio Society. Our core membership area is Texas, Oklahoma, Arkansas and Missouri. I've been putting together an all-day roster of speakers on digital subjects.

The main feature of TPRS, and the reason we have a fair number of members outside of our core area, is that we sponsor a packet network called TexNet that links most of the population centers of Texas (except El Paso and Houston), into Tulsa, Little Rock, and Springfield, Missouri. It is the largest network of its kind in the world, and has been the longest operating. GL Net in Michigan and Indiana uses TPRS TexNet technology. There are numerous, smaller networks using TPRS technology in Spain and other spots throughout the world.

TexNet uses a 9600 bps 440 mHz RF and landline backbone between nodes. User access is at 1200 bps, and usually on two meters (with some 222 mHz and 440 mHz ports). There is a mail server that allows messages to be posted and read within the system. A weather server provides the latest feeds from the National Weather Service, including the beaconing of severe weather statements (great for storm spotters). A conference bridge allows multi-connect chats from across the network. Local TexNode node operation provides netrom-type node operation for a local area. TexNet has been in continuous operation since the mid-80s. Some of its features were developed in 1995, indicating that this network is far from becoming a fossil!

If TexNet is so slick, why haven't you heard much or anything about it until now? It's just been that TPRS has been sticking to its original goals of educating users and improving/expanding its network. Texans are known for being big braggarts, but this issue of TPRS and TexNet has just slipped between the cracks until now. I had a little breathing room this weekend, and was reflecting on how fine a group we've got. There are several folks I want to mention without slighting those whose efforts

(cont'd from page 7)

whose main source must be the better OHS channel (fewer packet bit errors).

Maximum observable TOR throughputs were about the same for NVIS and OHS paths, although individual measurements came closer to maxima more often on the long than on the short paths. On packet, we achieved maximum OHS throughput of about 25 char/s vs about 17 char/s for NVIS.

These results suggest that hams need to separate long from short distance paths when they compare HF throughput performance of Gtor and packet. A revision of opinion on HF packet performance in ASCII file transfers over uncrowded standard skywave paths may also be called for.

have been just as integral to the success of the organization and the network. The godfather of TexNet, Tom McDermott, N5EG; Network Manager, Harry Ridenour, N0CCW; Firmware Guru Bob Morgan, WB5AOH; and past-President Greg Jones, WD5IVD. We couldn't have run as efficient a ship as we have without Office Manager Dorothy Jones, KA5DWR. It's people who do instead of dream who have made TPRS one of the best-kept secrets in digital amateur radio.

Other regional digital groups do a great job within their areas, too. CAPRA in Chicagoland, and NEDA in the northeast come to mind. If you are fortunate enough to be able to get a group of folks together and actually do things, bully for you! If there's one thing I've learned in nearly 30 years of hamming, is that you have more fun when you do things as part of a group. While it is important to support a national digital group, such as the IDRA, don't forget to be active on the local and regional level. Ham radio needs this kind activity more than ever.

If you'd like some more information on the regional organization the Texas Packet Radio Society, we'd be happy to send it to you. Just drop a note to us at P.O. Box 50238, Denton, Texas 76206-0238. We'd be happy to swap ideas with other regional organizations. Visit our web page at http://www.tprs.org.

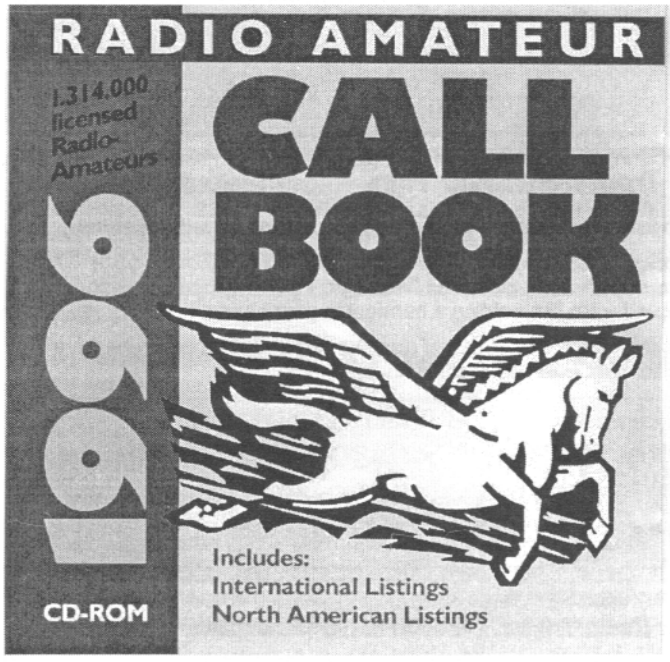
If you've got something interesting happening with packet radio or have a question that you think might have some universal interest, keep me in mind! You can reach me at P.O. Box 189, Burleson, Texas 76097-0189. E-mail at 73427.2246@compuserve.com. Packet at WO5H@WO5H.#DFW.TX.USA.NOAM. Until next time, 73, and keep using your Packet Power!

*Dave Wolf, WO5H*

# RAC'n Rollup - A Software Review

**New User Interface for the 'Flying Horse' Radio Amateur Callbook**

*by Bob Boyd, W1VXV*
*P.O. Box 571 • Kennebunkport, ME 04046*




The Radio Amateur Callbook, Inc. CD-ROM callbook became available in November, 1996 containing more than 1.3 million listings in more than 250 countries. While it was great to be able to access U.S. and foreign callsign data from one source, there were some shortcomings in the user interface that was provided with the CD-ROM. First was the lack of any ability to print the address data to labels. and second was the lack of country data (name and CQ zone) for foreign calls or grid-square data for U.S. calls. Steve Hajducek, N2CKH, has addressed both shortcomings with his inexpensive utility program called RAC'n Rollup.

The program requires MS Windows 3.1, Windows 95, or Windows NT, a VGA or better monitor, and the Radio Amateur Callbook CD-ROM. It is written as a drop-down application (Windows rollup - hence the name) so that only the caption bar need be present on the screen when not in use. The interface is clean, attractive, and straight forward; push buttons and check boxes are used for most functions. Although the CD-ROM is built with separate U.S. and foreign databases, RAC'n Rollup automatically selects the appropriate database based upon the prefix. Prefix search can be performed upon a prefix or full callsign, or can be turned off for a very slight increase in speed.

Callsign name and address data can be either manually or automatically queued for label printing on the standard label sizes of 3 1/2 x 15/16" by 1 or 2 across. Extensive testing has been done with dot matrix, ink jet, and laser printers to LPT1 on a parallel port. The software is being augmented, based upon my recommendation, to support additional parallel ports, and the Costar Labelwriter serial port printer. Print options include being able to control whether or not U.S.A. is added to the last line of a U.S. address, and whether the callsign is appended to the name line.

Support will be provided by N2CKH to registered users of RAC'n Rollup. A BBS is available for down-loading of files, and email inquiries may be sent to n2ckh@bytewise.org. The software is reasonably priced at $9.95 plus $1.50 domestic shipping and handling ($5.00 foreign). His goal is to provide quality software with the most needed features at a reasonable price to the amateur radio community. A demo version of this program is available from the support BBS (1-908-363-2760, 2.4 to 28.8 Kb, 8N1) and other amateur radio BBS sites as RAC_DEMO.ZIP

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## SOFTWARE

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# The Last Word

## from the Editor

*Jim Mortensen, N2HOS • PO Box 596 Somers, NY 10596-0596.*
*CompuServe ID: 71573,1077* • 914.276.1058 • fax: 914.276.1059.


**Express 3.6—the waiting game!** As I write this, the newest version of Express is complete. But I don't yet have it, even now three days after Peter said it was all done. As far as I know, no one else in the world has it either. The reason? Peter's Internet link is down and service is now so bad that it takes six minutes of long distance time to Paris for a three line CompuServe message. Sending a complex 2 meg binary file at that rate would cost half the amount of Benin's external debt! While I have no idea how much money that is I know for a fact he can't spare the two weeks it would take to transmit it via that link. Peter would be here before the file! HI

Whatever happens, we know we will have it no later than Thursday afternoon at Dayton. The best way to follow progress in this saga—watch the Digital Journal website (http://www.n2hos.com/digital). There you will see the earliest advice as to its availability. You will also be able to download it directly form that location on the Net. No more FTP-ing around. Just click download and, a few minutes later, the file is yours. Be sure and read the text file before you do anything but unzip 3.6! Other key files like the HAL drivers, Winlink, WF1B's RTTY upgrade, etc. are now a regular feature of the Journal's site. So drop by regularly. All these files will be on the IRDA FTP site and in the Software Center for those who want hard copy.

**DX News now on the Digital Journal website**. Read all about this new service in AA5AU's DX column. No, don't expect anything like the DX Cluster, but Don and I will try to get all the meaningful RTTY DX news on the site at the earliest possible moment. We have tracked the ZL8 progress for example from a) departure from the US to b) arrival in New Zealand to c) arrival on Kermadec and d) to the first RTTY schedule announcement. Hope you worked them!

**The SP Contest proved to be an interesting experience**. Propagation was at its low, low point of the week/month/year/cycle! Or, so it seemed. But it all depends, as they say, on which newspaper you read.

Some of the reports from the WF1B reflector were interesting, some dismal, some quite humorous. I clipped three to give you a flavor of the diverse results. Bill W7LZP was one of the first to check in. Fortunately, he has a well developed sense of humor. "Most exciting moment: Found an A92 on 20 long path, working JAs. Least exciting moment: Couldn't work him! Most humorous moment: Overheard two JAs discussing the rules. One said: 'The Europeans are sending serial numbers and the US stations are sending zone numbers. W7LZP is sending both... hi hi.' (you had to have been there)." Bill turned in a score of 117,600 points based on 204 Q's, 28 mults and 5 Continents. Then AB5KD clocked in with an unmentionable score based on 143 QSO's. This is a new low for Ron's station and represents a rate of about one QSO every four minutes worked. He hasn't done that badly since the time he forgot to connect the coax to the antenna!

Then Jukka OH2GI checked in somewhat later. He logged 300Q's, 106 countries and 41 SP provinces (the objective of the contest) and scored 1,674,918 points. That sounds like a pretty solid score.

These operators are well known, hi-test contest operators of acknowledged persistence. They have a high degree of credibility. And we know about their antennas and amplifiers. But based on these reports we have to ask: a) were they in the same contest? b) do we have a new kind of propagation scheme that favors one continent over another? c) or, did the States of Texas and Washington get blacked out this past weekend for some inexplicable reason? All I know is, that with a beam pointed toward Europe, I worked but a small cluster of stations. And, for the first time in many-a-moon I was unable to link with TY1PS on 20 meters. It can't get much worse than that.

**WOW! . . . is it a bit less than WOW?** Another one of those CD ROM's arrived today, only this time it was by invitation. CompuServe launched their newest Win95 Internet package some five or six weeks ago. I signed up for the trial because it was an offer difficult to refuse. "Free 30 Day Trial, then unlimited time on line for $14.95 per month, so long as you remain a CIS member." With CompuServe's vast access network behind it, this is a serious thrust into the mainline Internet provider market. In fact, the price sets a new standard if, repeat IF, the software is up to it's competition. Let's take a look.

WOW! is probably a full-scale WOW! if you have a spouse and three kids who use the same computer, have modest computer skills, want separate E-mail accounts and you want some control over the kid's Internet access. The product fulfills its promise as a 'family' program in every way imaginable. It's very completeness and simplicity is its biggest drawback for the more serious user of the Internet. And, perhaps (depending on your proclivities in the matter) the presence of Microsoft's Browser is a minus as well.

My first problem with the program began on its very first appearance in its self-starting sequence. On my 17 inch screen, it demands "small fonts" and "small fonts" only. No exceptions, thank you! I dislike the very idea. Working on this document in small fonts, for example, makes 12 point type look like 6 point type. Foolish . . . and I can't imagine why they need it. So, I switched to another computer. Fortunately, the 10.5 active matrix screen operates to WOW's satisfaction, even though it doesn't use small fonts. Hi!

Setup and registration is painfully simple and agonizingly slow! Voice and smiling face combine to take me by the hand one little window at a time and lead me through modem and connect details. The appropriate 800 number is dialed and registration completed in the same manner. No problems of any kind were encountered as CIS set up passwords, addresses and credit card info. But I do not really like to be treated as a beginning beginner!

I then linked with WOW as a first time user. My sense is that about 40% of each screen is taken up by "story-book" graphics that are indeed intelligent and easy to read, but substantially oversized. This is not an easy adaptation for someone who has no young children hanging around the screen. And when it comes to firing up Explorer (the MS browser), the impression seems more like a virtual trip to the World of Oz than a serious, down-to-earth Internet tool. But that may be my prejudice.

One very neat thing exists within the sign-up procedure. If you think about it at the time, you can use your call sign as your address. It might read, for example, n2hos@wow.com. Not bad for an address, if I have to say so myself.

Overlook the graphics for the moment. Explorer does its work quite well. The web pages come up at reasonable speed, suggesting that CIS has solved some of it traffic problems on the network. And the graphics of familiar pages come up like they do in Netscape . . . except for one little detail. Every piece of the page is in the right spot, the type is the right size, the graphics work well, the hyperlinks operate as they should, but the color is strange and unpredictable. For example, I first went to http://www.n2hos/digital, a page I know reasonably well. The type on the title page on alternate lines showed up a bright chartreuse!! Believe me, that is not what we had in mind when we set up the welcome page there. Hi! Other pages with which I am familiar showed similar anomalies and, when I jumped back to the Digital Journal page all of the lines were neon-like chartreuse. Man, this is progress! Just another example of the "standards" on the Internet.

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I may be unfair. No time was spent with the Help files to see if there is a way to adjust the colors. But there was no obvious way that I could find among the various large buttons on the browser screen. It is reassuring to know that, unlike some browsers, Explorer does see exactly the same layout (both graphics and text) as Netscape.

Shortcomings aside, and they are not monumental, this is a fantastic bargain. And a fantastically easy way to get on the net for you and your family (the registration process includes both spouse and children for registration, E-mail, etc.). The price is unbeatable. There is no registration fee, no software cost. If you have a 486/66 computer, 8 megs (better yet, 16) of RAM and are running Win95, (and only if!) give it a try. You have absolutely nothing to lose and may, in the process, find the best provider in town.

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**California's flag is 150 years old** and has been flying high ever since it was first raised over Sonoma, in what was then the California Republic. In any event, the Valley of the Moon ARC is going to make something out of this event, as indeed they should.

A special station has been set up and will have a special callsign N6S (for N6Sonoma, of course). Operating from June 14 to July 9, they will work RTTY on 3625, 7082, 10132, 14082, 21082, CW 'thirty up' expect on 18078 and QRP '60 up' except 7040. Of course they will operate on SSB as well.

Get the special 'Bear Flag' QSL via N6KM, SASE, of course. Thanks to Ken N6KM for this bulletin. He is also trustee of the club station.

**Peter G3IRM wants to expand CCW to include CW**. And I agreed. CW is after all a digital mode and one of the favorite modes of our readers. So, starting in July, he will expand his column to include comments and correspondence on the oldest mode of all. Starting off the parade will be a look at some new CW software that reportedly reads signals buried in the noise. We look forward to some active discussion!

**Tom N3PGG didn't know what to write about** so I asked him the questions I have asked other NTS operators. Who are these folks who devote themselves to NTS? Are they a different breed? Why do they allocate all their time, energy and equipment to do something for somebody else? What makes them tick? Tom's answer is interesting and different than anything I have heard before. Maybe they aren't so different after all.

"It's interesting how perceptions of those involved in various special interest groups of the hobby are conjured up. As far as being a different breed, I'm not sure if that's a compliment or a slam. Hi! I think most of the NTS dedicated operators are ex-military and have had experience sending and receiving messages during their prior careers. It was commonplace to handle time valued information in less than perfect conditions in choice real estate locations such as fox holes and aircraft carriers. Once involved with Amateur Radio the desire to handle traffic and serve others was a natural progression.

To assume they don't chase DX or ragchew would be incorrect. Personally, I enjoy working a good contest, occasionally check into the DX Nets on 14.247 or 14.226.5 and I am a certified member of QST's Rag Chewer's Club for what that's worth.

Reporting a big score in the Field Services Section of QST is certainly important to a few of the NTS operators. But I suppose when you read the various contest scores, those are important to the 'big guns' in contesting, too. I think the driving force behind most operators is to provide a service to others, particularly during natural disasters. Keeping track of traffic count is a necessity as is the reporting of same.

As far as why they buy the equipment . . . the gear required for digital software to support a BBS or MBO would be the same as required for any mode. Adding the software to support the BBS or MBO would be the only difference.

That's the neat thing about this hobby. Everyone finds a niche they enjoy, be it contesting, DX, ragchewing, NTS, satellites, SSTV, moon bounce or whatever. It may not be the cheapest hobby around but in my opinion it is the BEST!

Hope everyone enjoyed Dayton and found that piece of gear to rejuvenate their excitement with the ever-changing world of Amateur radio."

**Remember, like the birds, we have flown north**. Gen and I are in Somers, NY until September 19. PO Box 596, Somers, NY 10589. 914.276.1058 • fax: 914.276.1059.

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*(cont'd from page 3)*

ed a real time mini scope. Simply, hit the "M" key and up pops the mini scope on the lower part of the screen. Again, if you are unsure of what to look for, the manual has some "off the screen" pictures of the different signals and what they should look like. Very slick idea! At my station I have a Ham band-only radio and since most of these signals fall outside Ham bands, I had to fall back on my portable Sony shortwave radio. It has a USB/LSB switch and it is very tricky to tune. However, I found no difficulty tuning any of the FAX signals I came across.

**Crazy Sounds**

What does FAX sound like, you ask? First, let me explain how it works and then how it sounds. Imagine a weather map before you, ready for transmission. The FAX machine operator wraps this map around a small drum that revolves. A photo detector mounted near the drum surface moves along the axis of the revolving drum. As it does this, it picks up electrical impulses proportional to the amount of light reflected from the map being transmitted. When you are tuning a signal, listen for a whirring sound, then a thump. This is in relation to the drum reflections being detected by the photo detector and the end of a line. There is really more to it than what I have mentioned here and I refer you to the manual for an in-depth explanation. Start pulses, stop pulses, sync pulses and LPM (lines per minute) are involved. All of these features are adjustable, but I found the default settings to work just fine. Most of the features I have mentioned are controlled by the "F" keys.

When you have a signal properly tuned in, a picture will begin to develop running from top to bottom and left to right on your screen. Be patient, it takes a few minutes for a picture to completely fill the screen. If you are listening to the sound at the same time, you will hear the thump as the picture transitions from one line to the next. That's about all there is to tuning a signal. Almost forgot to mention the Zoom feature. When an image is on screen you can zoom in on a particular spot within this image; just hit the "Z" key and a small box about one fourth the size of the screen appears. Move it around with the cursor keys to where you want the zoom to be and *bingo*, there is a blowup of that portion of the screen. Use the tools available to enhance the image i.e.; slant/tilt correction, picture length/width ratio distortion correction, multiple/overlapping image correction, inverting, flipping and rotating of images. Again, I found the default settings worked great for me. Suppose you work all day and would like to copy your favorite FAX station. No problem, there is an unattended picture capture and save feature. You can even program an autolist feature that allows you to set up your favorite stations in a date/time frame.

Once an image is captured, what can be done with it, you ask? You can save it or print it later or you can print it immediately. Although the print function is convenient, better quality pictures may obtained by converting the picture to a PCX or GIF format and exporting them to a different picture/print program that has the ability to import such pictures. If you save the image and recall it later, tools are available so that you can enhance the image to your liking. Use your imagination; rotate, flip, change colors and darken/lighten an image. This will be a fun feature once you get the hang of it.

This device has many other features too numerous to mention in this article but, dollar for dollar you won't find a better bargain than the AEA FAX III modem. You'll be rewarded with many hours of enjoyment and at the same time you'll learn about FAX transmissions. A worthwhile investment for about $75. Now that this review is completed, I'm going to sit back and have more fun with my AEA FAX III modem.

*73 de Dale, W6IWO*

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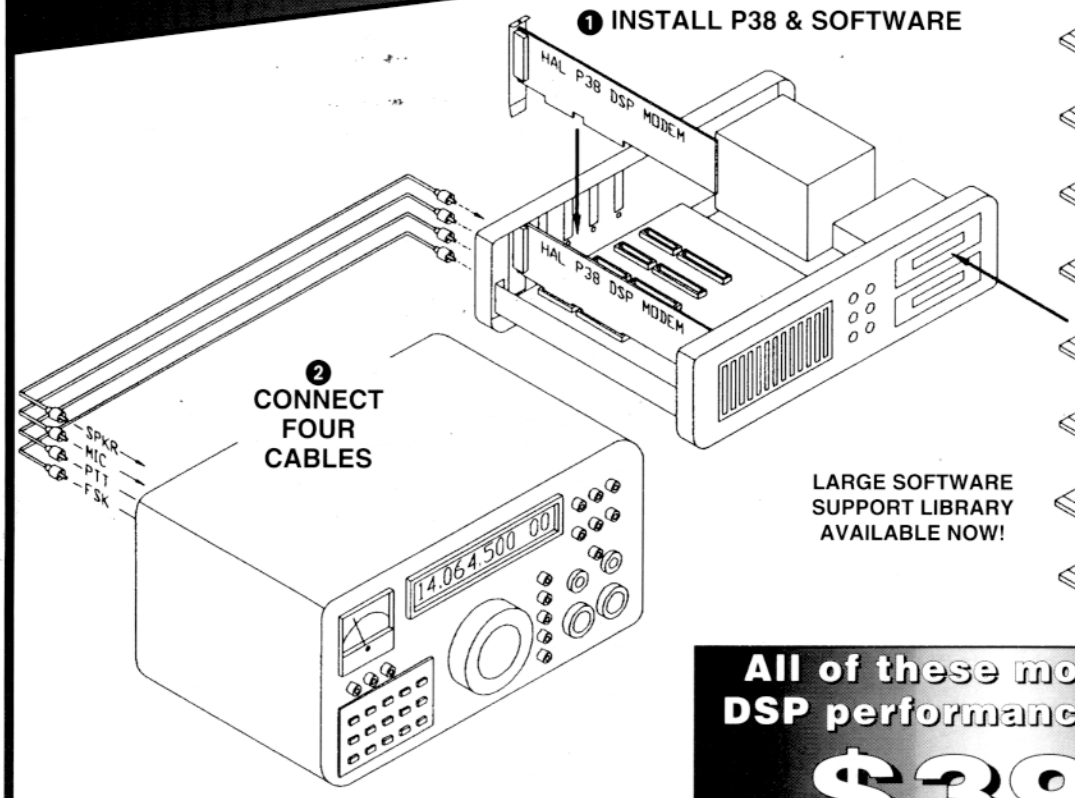


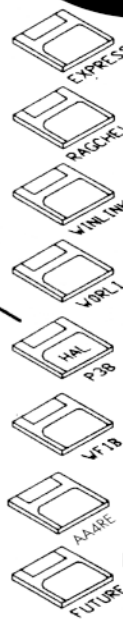


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