

DIGITAL

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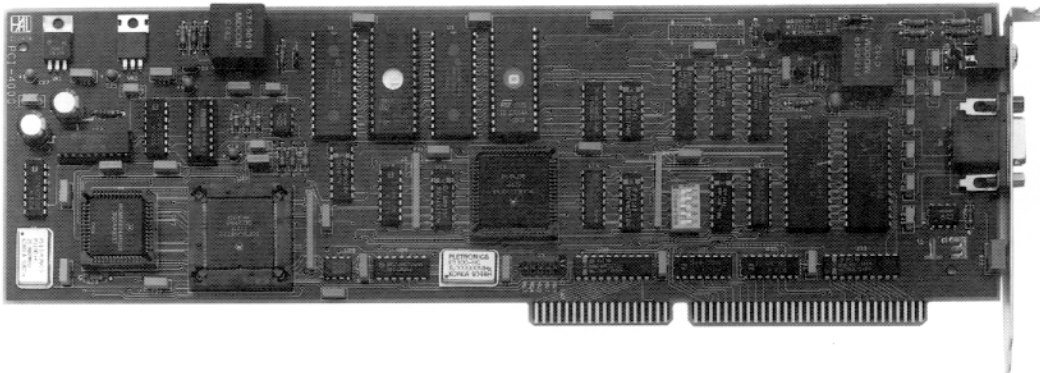
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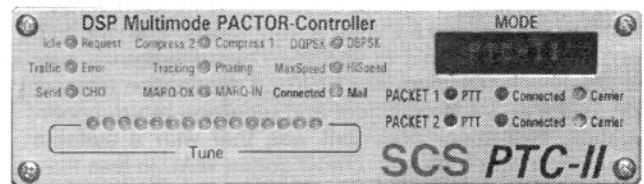
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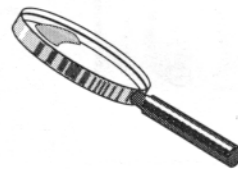
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President's Corner

A view from the top

by Paul S. Richter, W4ZB

P.O. Box 19190 • Washington, DC 20036-9190 / CIS 70743,3517



It's almost the end of the year and the Holiday Season is upon us again. As I begin to write, I'm sitting on a 767 at 40,000 feet on a 5 1/2 hour evening flight from Washington to Los Angeles for a very busy day tomorrow and an overnight return flight tomorrow night. Hard to believe, but time always seems to zip by!

The end of the year is a time to look back and also to look forward, and a lot has happened in the last year. With the help of many, the IDRA is now in its third year, and the Digital Journal (which started as the RTTY Journal) is now beginning its 44th year under the guidance of Jim Mortensen, N2HOS, our very devoted, energetic and enthusiastic editor. Interest in operating digital modes and in the development of new digital technologies has been increasing as has IDRA's worldwide membership. And, the IDRA has established a good presence on the Internet to facilitate its worldwide communications and services and is actively working on several programs to use the Internet to lower the cost of disseminating the materials which it publishes.

As I fly along, I pick up my newspapers and several magazines and begin reading. I see numerous articles in which the writers are providing WWW Internet addresses for further information and many advertisers are also now giving e-mail and WWW addresses. I turn to a page in the New York Times and see an advertisement for local telephone dial up access in the New York City area for "unlimited" Internet PPP account access at 28.8 kbps for \$15.00 per month. This is a fraction of what such service cost a year ago and this material is directed to a general audience! How are these developments going to affect our hobby?

A few months ago, I saw an e-mail from Phil Karn, KA9Q, in which he remarked that a few years ago he had Worked All Continents in less than two minutes — over the Internet — by manually PINGing destination Internet addresses on each continent and receiving return confirmations. His trailer comment was that with a suitable automation script, he could have gotten WAC in less than 10 seconds.

Next I pull out a new COMSAT Laboratories Review which I have just received and begin skimming. Numerous projects utilizing modern digital communications technology are underway, but one catches my eye in particular which I want to mention. Comsat is continuing development of its 1200 bps voice compression codec system using a vocoder approach for encoding and decoding voice signals with a low cost DSP system from Texas Instruments. This technology, while still too pricey for widespread ham radio use, is now claimed to have a subjective "quality" which exceeds that of the high grade military 2400 bps vocoders. Practical systems will be available for HF operation before long which will utilize use this voice encoding at 1200 bps with good bit error tolerance. And, twenty minutes of recognizable, natural speech will fit on a single 1.44M computer diskette! Those who remember what SSB did to AM on

HF in the early 1960's will want to watch what this new technology may do to SSB for HF voice communications.

I take a break and look out the window and upward and see light from the stars. That very short wavelength ("visible") electromagnetic radiation which my eyes can detect passes right through the ionosphere so, of course, I can't see the ionosphere directly. But I think about the condition of the "invisible" ionosphere as we approach the minimum of the current sunspot cycle. How is the relatively long wavelength HF propagation which depends upon the ionosphere doing now? Certainly it is not as good as it has been and we have to be more patient now to find the good openings. But long distance and worldwide HF communications are still readily possible, and new sunspots for the next cycle have already been detected! Recent digital mode DX and Contest activities on the HF bands have demonstrated that conditions are still very usable. And, a year from now conditions will be on the upswing again.

Also looking forward, all are reminded that the upcoming Dayton Hamvention will be from May 17-19, 1996 this coming spring, and it is not too early now to plan ahead for it. Jay Townsend WS7I and Dale Sinner W6IWO are already working on it - it will be a bigger and better event than ever for IDRA members so everyone should plan now to attend!

Also, don't forget that IDRA is also always seeking more members! Tell all of your ham colleagues about the IDRA and invite them to join. More IDRA members means more revenue which will enable a further improved and larger Digital Journal, and better support for other IDRA activities. Go out and find some new members and make sure they sign up! IDRA is also continuing to look for volunteers with programming and other technical skills who would like to help out.

Best wishes to all for the holidays.

73, Paul Richter W4ZB



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High Performance RTTY

on a budget

by Doug Hall, KF4KL

4400 Duraleigh Road • Raleigh, NC 27612



The proliferation of multimode data controllers has brought the HF digital modes to more hams than ever before, and made it relatively easy to get started in this fascinating area of our hobby. New protocols and modulation schemes allow us to send data faster and with fewer errors than were previously possible with RTTY. Nevertheless, RTTY remains popular, especially among the DXing and contesting crowd. When it comes to trying to work a 'new one' in a big pileup or working 100 stations an hour in a contest, RTTY is still the HF digital mode of choice.

I'm a big promoter of RTTY - for DXing, contesting, ragchewing, you name it - it's just plain fun. But in my efforts to interest new hams (or even old ones) in RTTY operation I often hear these same comments: "It costs too much." "You have to buy the multimode and then spend more money on the software." "I'd have to upgrade my computer." My answers are always the same: "No it doesn't, No you don't, and no you won't." Certainly you can spend a pile of money to get set up on RTTY, but you don't have to. In this article I'll show you some low cost approaches to getting on RTTY without compromising performance.

Multimodes vs. Dumb TUs

Before we examine some low cost solutions it's worth taking a look at what the current (and more expensive) technology has to offer. These days most people simply buy multimode data controllers which provide operation on several digital modes including RTTY. Notice that I'm referring to these units as "multimodes" and not TNCs. A TNC (Terminal Node Controller) is a packet radio interface, while a multimode may or may not provide packet operation in addition to the HF digital modes.

When RTTY signals are received at your antenna, the radio demodulates them and produces an audio signal containing two distinct tones. The two tones in this demodulated signal are called

the MARK and SPACE tones, and represent 1s and 0s in the received data stream. The audio output from the radio is fed to the multimode audio input, where internal filters turn the MARK and SPACE tones back into a digital stream of 1s and 0s. This digital stream is then fed to the microprocessor in the controller. In the case of RTTY, this microprocessor converts the 5-bit Baudot (pronounced baw-DOH) code used in RTTY operation into the 7-bit ASCII code used by most computers today. By the way, when we refer to the number of bits in a binary code, we're describing the number of states (or characters in the case of RTTY) that can be represented by this code. In the case of the 5 bit Baudot code used for RTTY, we have 5 bits, and each bit can be ON or OFF, yielding a total of 2 to the 5th power, or 32 characters. Astute readers will realize that 32 characters are not enough to represent the 26 letters of the alphabet as well as the numerals 0-9 and punctuation. The Baudot code gets around this by defining two SHIFT codes, LTRS and FIGS, which stand for letters and figures. These work just like the shift key on your keyboard, and when the LTRS code is received in RTTY, certain characters represent the letters in the alphabet. Many of these same code are used to represent numbers and punctuation when a FIGS code has been received. Even with the implementation of shift codes, Baudot RTTY is limited to the upper case alphabet. There just aren't enough bits to send lower case as well. When RTTY is transmitted, the microprocessor converts incoming ASCII into 5-bit Baudot and generates the appropriate MARK and SPACE tones to transmit over the air. Since the data in and out of the multimode is in ASCII format, the software on the computer may be a simple ASCII terminal program - the same as you'd use for a telephone modem. Figure 1 shows a block diagram depicting a typical multimode setup. Some popular multimodes include the AEA PK-232, Kantronics KAM, MFJ-1278, and the new HAL P38.

What did people do before multimode data controllers were available? They used devices called Terminal Units (TUs) which basically consist of the MARK and SPACE filters and the circuitry to convert the MARK and SPACE tones into 1s and 0s. Most (but not all) of the older TUs had RS-232 ports. What they lacked was the microprocessor, and the Baudot-to-ASCII conversion was the computer's job. Because these TUs had no "smarts" in the form of a built-in computer, they are often referred to as "dumb TUs." Figure 2 shows a typical RTTY setup using a dumb TU instead of a multimode controller. Notice that the task of converting the Baudot code into ASCII is placed on the computer since there is no computer built into the TU to handle the conversion. The beauty of these dumb TUs is that you can pick them up pretty inexpensively now, and in many cases the performance on RTTY is excellent. In some cases these old TUs will actually do a better job on RTTY than some of the multimodes because the MARK and SPACE filters in the TU have been optimized for RTTY only. They don't have to handle the wider bandwidths of the other HF digital modes, so performance on RTTY is not compromised.

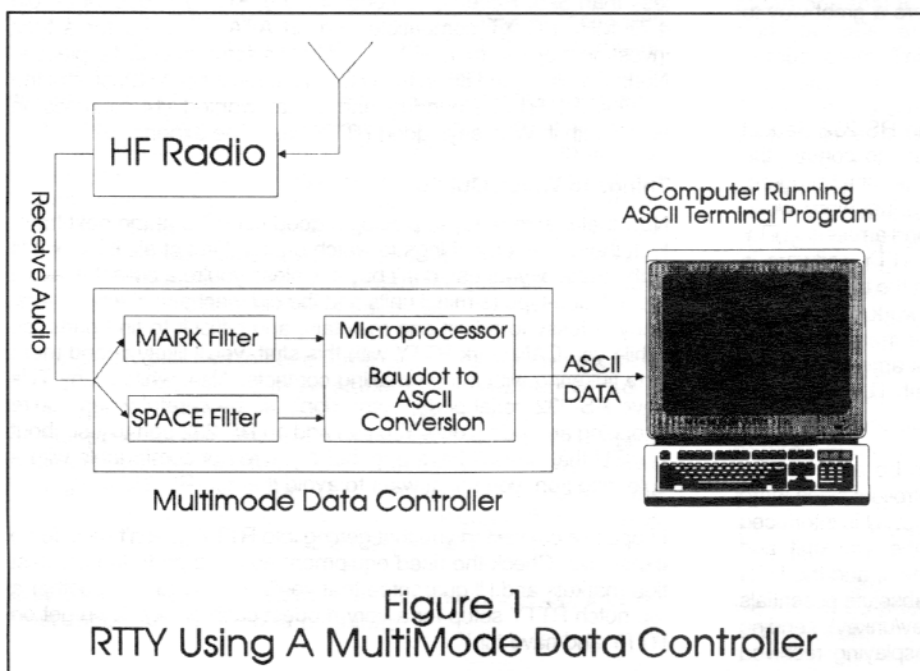


Figure 1
RTTY Using A MultiMode Data Controller

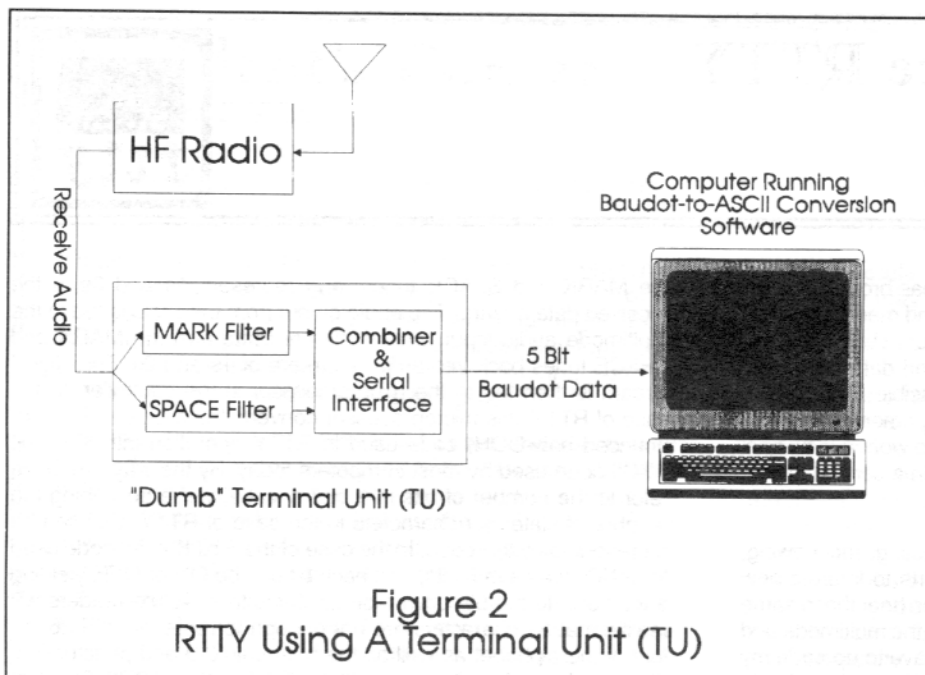


Figure 2
RTTY Using A Terminal Unit (TU)

Some Popular TUs

The introduction of the multimode data controller essentially killed the Terminal Unit market, but if you glance through some Amateur Radio magazines from the late 70's through the mid-80's you see that there was once a variety of TUs available. Companies such as AEA, HAL, Heathkit, Flesher, IRL, Tono, and Kantronics made a number of different RTTY TUs, some of them quite costly even in today's dollars. Some of these companies are still around, having brought out multimodes or more specialized products, but unfortunately many of the TU manufacturers went out of business when the TU market died. The bright side is that many of these TUs can be found on the used market today for a fraction of their original cost, offering good RTTY performance for very little cash outlay. I seldom go to a hamfest flea market without seeing several good TUs at bargain prices. Some good TUs to look for include the AEA CP-1 and CP-100, the Kantronics Interface II, the IRL FSK-1000 and FSK-500, and just about anything made by HAL, although the HAL equipment tends to be a bit more expensive. Recently I returned from a hamfest with 3 good TUs for which I paid less than \$50 total. Ham clubs take note: these old TUs are a great way to get new hams started in RTTY.

What About Software?

Since TUs simply convert the RTTY signal to an RS-232 Baudot data stream, we'll need some computer software to convert the Baudot information into readable text. A regular terminal program (such as you'd use with your telephone modem) just won't work, since telephone modems work with ASCII data, and amateur RTTY operation uses 5-bit Baudot code. Fortunately RTTY software is available for just about any computer made within the last 15 years, so you should be able to find something that will work with your TU regardless of the computer you have. And since these TUs were made in the days when 640K was an unheard-of amount of RAM, nearly all of the RTTY software available for dumb TUs will run on a computer with very modest resources.

Software dedicated to RTTY operation tends to be a bit simpler than the software often used with multimode controllers since there is only one mode to deal with (RTTY). Usually the TU is interfaced via the computer's RS-232 serial port, with the Transmit and Receive Data lines carrying the Baudot information, and the DTR or RTS line used for keying the transmitter. The absolute essentials in a RTTY program include transmitter control (key/unkey), sending typed characters out to be transmitted, and displaying received

characters on the screen. Some non-essential (but very handy) features include type-ahead buffering and programmable function keys. Type-ahead buffering allows you to begin typing your response while you are still receiving the other station's transmission. When it's your turn to transmit, you press the transmit key and all the text you have typed prior to that will be sent first. This is a wonderful feature for slow typists, since they can get a head start on their next transmission. Programmable function keys allow you to assign frequently used text, such as your call-sign or QTH, to a single key for quick and easy transmission during a QSO. You'll find that some RTTY terminal programs also allow you to change the baud rate, but since nearly all RTTY operation on the amateur bands takes place at 45 baud, this is a feature seldom needed. The ham radio archives at many Internet FTP sites contain programs for RTTY, and these programs can also be found on many of the CD ROM discs sold at hamfests. If you have an IBM PC compatible and you don't have access to any of these sources you can send me a blank floppy disk

and a self addressed stamped mailer and I'll send you several public domain RTTY terminal programs I've collected, including one I wrote called KLterm. KLterm is a small (around 50KB) RTTY terminal program with type-ahead capability and programmable function keys. It will work on any IBM compatible with a serial port, so if you've got an old PC sitting unused, dust it off and use it for RTTY. Or give it to the new ham down the street who wants to try RTTY. In any case, you don't need a 100 MHz Pentium system with 16 megabytes of RAM to run RTTY. Just about any PC will do nicely.

Speaking of computers, there are a number of older computers available on the used market at very reasonable prices, so that you could easily justify dedicating a computer to your RTTY station. My RTTY equipment consists of an IBM PC compatible computer complete with a hard drive and a color monitor and several different TUs. The total cash outlay for the computer AND the TUs was far less than the cost of a new multimode alone. In addition to the older IBM PC XT models, you can often pick up an old Commodore 64 or Atari 800 system complete with RTTY software at hamfests for less than \$25. Recently a friend of mine, KQ4QM, bought an old 4.77 MHz PC XT compatible and an AEA CP-1 TU for a total investment of less than \$50. He used this setup to take 1st place in North Carolina (and 8th in the U.S.) in the multi-single division of the 1995 ARRL RTTY Roundup, and he has worked 114 countries on RTTY with it. Who says good RTTY has to be expensive?

Things to Watch Out For

Now that you're ready to pick up a good used TU at the next hamfest, there are some things to watch out for. First of all, if it won't fit in the trunk of your car, don't buy it. Unless you're a collector, avoid the old tube-type terminal units and the old mechanical teleprinters. They're fussy to adjust and maintain, and difficult to find parts for. While you CAN work RTTY with this stuff, you'll likely spend more time tinkering with it than making contacts. Also, while many TUs have RS-232 serial ports, some don't, so be careful when you're shopping around for one. You can add an RS-232 port to just about any TU that doesn't have one, but if you're not comfortable with a soldering iron, you might want to avoid the non-RS-232 TUs.

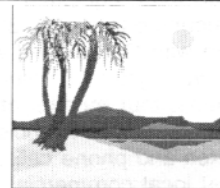
I hope I've convinced you that getting into RTTY doesn't have to be expensive. Check the used equipment ads and go to the hamfest flea markets and I'll guarantee that you'll be able to put together a top notch RTTY setup for a very modest cash outlay. Then get on RTTY and have fun!

Digital DXing

The September 1995 Lord Howe Island DXpedition

by Glenn Vinson, W6OTC

#2 Embarcadero Center, #1660 • San Francisco, CA 94111



N4TQO, W6OTC, KE6FV about to take-off to Lord Howe Island from Sydney

In mid-September, I (VK9LZ), Steve Merchant, N4TQO (VK9LX) and Steve Stark, KE6FV (VK9NM) traveled to Lord Howe Island, primarily to activate RTTY and CW. Steve Merchant, a well-known CW contest operator, particularly at M/S and M/M stations, focused on the wire antennas, while Steve Stark, a RTTY enthusiast and author of the Auto-Op software, was in charge of station layout. We made approximately 1,200 RTTY, 2,000 CW and 100 SSB contacts, and competed as an M/S entry from Oceania in the CQWW/IDRA RTTY Contest. In the August and October issues of the Digital Journal, I described some of the preparations for this trip. Here I will report on the final preparations for the trip and on the trip, itself.

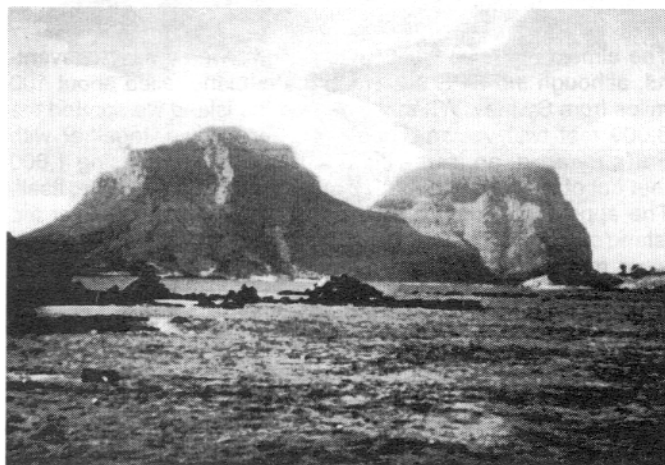
Lord Howe Island is volcanic in origin, located in the South Pacific 700 km northeast of Sydney and 11,200 km southwest of San Francisco. It had no known human inhabitants until around 1830 and the present permanent population numbers less than 300. Hotel beds are limited to 400 in an effort to preserve the environment of the Lord Howe Island group as a U. N.-designated World Heritage Area. The island's picturesque lagoon is formed by the most southerly coral reef in the world, with mean temperatures that are quite cool by tropical standards, and annual rainfall averaging about 1.6 meters per year. Apart from tourism, its main industry is the cultivation and export of the ornamental *Kentia* palm tree.

We originally planned to have three operators and two stations, then four operators and three stations, and finally reverted to three ops/two stations when Eddie, W6/G0AZT found, two weeks prior to our departure, that changed family circumstances prevented him from going with us. Nevertheless, Eddie volunteered to handle the QSL cards and to correct the inevitable problems in the logs, a job he began within two days of my return to San Francisco on September 26, 1995.

Only a few subjects dominated our planning and setup, and the most important, by far, was antennas.

Antennas.

During the planning phase, discussions of various antennas took much more time than any other issue; on site, erecting antennas took much more time than assembling the stations. From the beginning we intended to take a Force 12, DXpedition model C4. This beam is made to fit in a four-foot box and weighs about 45 pounds—easily checkable on airlines. However, I had some concern about whether the vegetation surrounding our bungalow at Trader Nick's on Lord Howe would allow erecting a triband beam. In early May, I was assured by the owners that there would be no problem erecting an antenna with a turning radius of 18 feet in the courtyard adjoining our bungalow—an assurance that would prove to be premature!



Volcanic peaks on Lord Howe Island

We also intended to bring a "genuine" G5RV. By genuine, I mean one that is built as described by G5RV, himself, in various journals and in Volume 2 of the ARRL Antenna Compendium. This antenna features 51 feet of copper wire on each side of an insulator and is suspended horizontally at least 20 feet above ground. Twin lead of any impedance is connected to each side of the horizontal wire and dropped down from the center insulator. The length of the twin lead, which acts as an impedance transformer, is then calculated by dividing (a) the design wavelength at its center frequency of 14.15 MHz by (b) the velocity factor of the twin lead. Finally, 52 ohm coax (not exceeding about 70 feet in length) is soldered to the bottom end of the twin lead. To save weight and cost, we used #14 stranded copper wire and 450 ohm twin lead (length = 34 feet). For this classic G5RV, the formula for calculating the length of the twin lead is $(Vf \times 492) / 14.15$, where Vf is the velocity factor of the twin lead. With our butane soldering iron in hand, we saw no need to pre-assemble this antenna, and found it very easy to make in the field.

Finally, we received much advice via the Internet about an appropriate antenna for the low bands and took enough wire (195 feet of #14 stranded copper) for an inverted-L and to lay out Beverages (600 feet of #22 stranded copper). For a mast we took a 25-pound 30 foot, aluminum army surplus model in a 30 inch box.

Our total equipment load, including hand carry luggage, amounted to about 230 kg. While we did not anticipate a problem with Qantas, we were concerned about the Sydney-Lord Howe flight on a twin-engine turboprop Boeing Dash 8. After almost four months of trading computer messages via travel agents in San Francisco and Sydney, and after many direct faxes and phone calls, I determined that we could not rely on that local commercial flight: despite our status as connecting international passengers and despite what the Qantas computers said, Eastern Australian Airways would not guarantee that we would be allowed to load this luggage even by buying an extra seat or paying for the overweight. Accordingly, I investigated shipping all of our gear by airfreight no later than mid-August (which would allow the gear to be sent to the island over a period of several days, as airline space permitted) or chartering our own flight on a smaller plane. Since the price of either alternative proved to be approximately equivalent, we elected to keep our equipment with us at all times and to charter a flight from Kentia Link, on a 9-passenger Piper Chieftain with ample payload. As we had hoped, when we departed the West Coast on Sunday, September 17, Qantas was extremely accommodating, and the charter on Kentia Link on Tuesday morning, September 19, worked perfectly (though every bit of luggage and our own bodies had to be weighed for weight and balance calculations).

The almost 500-mile flight to Lord Howe was mostly uneventful, although the GPS system in the airplane failed about 100 miles from Sydney. When we neared the island we spotted the 3,000 foot twin volcanic peaks on Lord Howe, together with Ball's Pyramid, an incredible sheer volcanic rock rising 1,800 feet out of the Pacific about 17 miles south of Lord Howe, itself. The approach to the Lord Howe airstrip was directly over the island's beautiful, clear lagoon. When we arrived at 2 pm, we were met by our host, Bill Shead, who, with his wife, Janne, owns Trader Nick's, the most modern accommodation on the Island. We loaded our bags and boxes into a trailer that Bill was pulling behind his van and set off on the ten-minute drive to our accommodations, expecting to be on the air in a few hours.

At Trader Nick's, Janne introduced us to all of the staff, and Bill showed us to our "rooms," which were in fact a three-bedroom building with three baths, two kitchens and two sitting rooms, all very, very nice. Unfortunately, the clear air space in our courtyard looked much too small for our C4, and the building had a very steep peaked tin roof—no good for erecting a big antenna. Bill was busy for the remainder of the afternoon and we decided we should nevertheless proceed with our original plan of first assembling the C4, followed by erecting the G5RV and eventually the inverted-L.

Assembly proceeded uneventfully until we came to the driven elements. After close investigation, tape measurements and grumbling, we found that there was no insulator for the 40 meter element, the 20 meter insulator had been taped to the 40 meter group of elements which were also mislabeled; and finally, the center 20 meter elements had not been drilled for the insulator that had been provided. We (mostly I, since it was at my house well in advance of the trip) kicked ourselves for not having completely checked the parts of this antenna prior to departure. Because no parts list is provided with these antennas, we had only laid out the bundles to insure that each element bundle was present, that we had the required u-bolts and insulating PVC and that we had both baluns. Now we needed to find or fabricate a center insulator, perhaps carved from local wood, find some sort of screws (preferably machine) to run through the 40 meter driven element and its new insulator to connect the balun, and to get a drill bit of the requisite size. Ruefully, I thought back to the hours GOAZT and I had spent in Georgetown, Guyana in 1994 fruitlessly looking for a simple U-bolt to replace a missing piece for our Cushcraft A3.

Darkness had now fallen; it was time for dinner. Since we had missed the early deadline for dinner at Trader Nick's, Bill took us up to a near-by restaurant for some excellent local kingfish—a fish we would come to eat in one form or another every day on Lord Howe Island!

At dawn the following morning, we rechecked our antenna assembly procedures and looked for a possible place to erect the as yet uncompleted antenna. One decision I and Steve Merchant reached that proved to be correct was not to rely on the non-pop rivets supplied by Force 12 for their DXpedition antennas, but to put in one or two or occasionally three of the pop rivets used for permanent installations. The electrical connection of the element parts was much better and the time to drill out the rivets when we disassembled the antenna was no more than about 20 seconds each. We also applied lots of Penetrox to all aluminum junctions. Again, upon disassembly, this "goop" proved easy to wipe off with a single swipe of a paper towel. Finally, with the pop rivets, the joints did not need to be taped with vinyl tape to hold the rivets in place.

Bill arrived to inspect our progress and immediately decided that the 37-foot elements of the beam were unlikely to be able to clear the Kentia palms that surrounded our bungalow. He suggested that we go down the road a short distance to look at another site for operating. He took us to the recently closed Lagoon Store, a general store owned by Gary Petherick who was in the process of selling it to the Sheads. This store had ample electrical outlets, a large flat open space in its rear and tall Norfolk Pines located in useful positions for wire antennas; in other words, a perfect DXpedition site. In addition, Bill told us not to worry about food; Janne (who is an excellent cook) would send food to us whenever we called Trader Nick's on the phone. He also provided bicycles for our 5-minute commute between our beds at Trader Nick's and the Lagoon Store. Bill assayed our needs and helped us find a PVC rod that was adequate for our 40 meter insulator, together with machine screws and an appropriate drill bit.

The details of the antenna erection process are too grim to recount for this article (especially since we managed to bend the army-surplus mast and break off the ends of two elements), but with Gary's help, and the help of a group of his friends, we eventually (at midday, Thursday, September 21) erected the C4 on a borrowed, steel pushup mast at 30 feet. The G5RV was raised to about 40 feet and the 195-foot inverted-L was suspended from another tree at about 45 feet. Each end of the wires was put into the pines by Steve Merchant using a wrist rocket. Although a wrist rocket appears to be a simple variant of a child's slingshot, Steve's prior experience in North Carolina with this device, which provides a way of propelling to the top of a handy tree a lead weight tied to a long line of monofilament, quickly proved to be essential. KE6FV and I learned that the wrist rocket definitely requires lots of practice if the antennas are to be placed accurately at the 40-50 foot level in the trees. We found that at these heights the G5RV outperformed the lower 40 meter rotatable dipole of the Force 12 and worked well in search and pounce mode on other bands during the RTTY contest. On 20 and 15 meters the beam was of course greatly superior for running. The inverted-L loaded fine on 80 meters but could have been improved on 160 by a matchbox that we had hoped to receive before departure; also for low band receiving we badly needed the help of Beverages that for similar reasons (non-receipt of expected matching transformers before our departure) we could not lay out. Overall, we were satisfied overall with these antennas, if not our eventual inability to operate satisfactorily on the low bands.

(End of part one. The final installment will appear in the January issue—ed)

WRIST ROCKET TIPS

by Steve Merchant, N4TQO
3045 Jackson Street • San Francisco, CA 94115

I learned a few things about using Wrist Rockets while living in North Carolina (home of 90 ft. pine trees), and have since gained a few tips from friends on the Internet contest reflector.

The Wrist Rocket is a glorified slingshot that sells in the \$6-10 range in discount sporting goods stores. Made with a molded plastic body and surgical tubing, it has a pistol grip and a collapsible metal brace which fits over the top of your wrist and forearm. The brace is essential to achieving good aim and distance. Be sure to buy an extra tubing and pouch set — the tubing is guaranteed to fail at the wrong moment.

My experience is that a Wrist Rocket is reliable for shooting to heights of 50-60 feet. If you are willing to spend considerable time at it, you may be able to shoot to the 70-75 foot level, but for reliable shots in the 60-100+ foot range you will need a special purpose slingshot that is larger and heavier than you will want to fool with for most projects. In the Raleigh, NC area, NA4K is the 100 ft. shot specialist and has built amazing equipment to achieve these shots.

The commonly accepted method for shooting lines over trees with a Wrist Rocket is as follows: locate lead fishing weights (sinkers) — use the round ones with a ferrule on the end. Choose either two or three ounce weight — we used 2 oz. sinkers at Lord Howe and found them perfect. Avoid sinkers with well-defined edges or strange shapes — they can easily become tangled in branches or snarled with the line itself. The line to use is monofilament fishing line. If you are going to replace it immediately with something more substantial than monofilament, you can use 10-20 lb. test. If, like us at Lord Howe, you wish to rely on the monofilament to hold your antenna in the air, choose 50 lb. test or greater. Trees will pull and stretch both your haul line and the antenna wire itself. You want a line that can withstand these forces. Have enough sinkers and line for several shots — it's easy to get line tangled and lose sinkers.

Preparing to shoot involves a few steps. You'll need to estimate how much line to spool out for your shot. This will prevent the shot aborting because the line can't spool off fast enough. We estimated the amount required and spooled it into a large trash can, tying the near end of the line to one of the handles on the can. Obviously you can use other things such as a piece of canvas or wood, but the object is to spool out your line before shooting AND secure the near end so it doesn't disappear over the top of the tree as you admire your great shot.

Place the spooled-out line in front of you, and grab the sinker in the pouch on the Wrist Rocket with the ferrule pointing down. This will permit the sinker and line to spool freely. Follow the instructions given for aiming the Wrist Rocket, turning your wrist 90 degrees and aiming over the top of one side of the frame. I usually try to take a few practice shots with stones of similar weight to get a feel for what shot will be like. No matter how many practice shots you take, though, the real thing will fall shorter because of the weight of the line. Once you have placed your line approximately where you want it, tie your rope to the near end and pull it over, then attach the antenna. Good luck using the wrist rocket.



UNDER THE TREE

The season for gift giving is upon us. No department store, discount, flea market nor any 800 number offers the gifts I need to fill my list. Gifts for my XYL? No, that's an easy task in comparison. These gifts are to those people who give so much that a mere bauble under the tree is totally insufficient. They must receive something more, something memorable, unique, one-of-a-kind, otherwise unavailable (yet affordable). So, as I fly out of a chilling New York, vectored to the balmy environment of Indian Rocks Beach, I created my own roster of presents (few of which are available anywhere else on earth), and now wing them on their way via instantaneous transfer to the deserving folks who make this magazine possible. I trust you will join me in extending the best of the holiday season to each and everyone of them, just as we collectively and individually wish all of you the very best for the holiday season, and success in the new year.

To Jules W2JGR, with fond regards and unlimited admiration for his untiring efforts on behalf of the Digital Journal, his unvarying high quality and the service he provides to DX interests around the world, I send (wrapped in my most recent DXCC computer printout and tied with a ribbon made from old teleprinter tape) a certificate good for ONE FREE COUNTRY OF HIS CHOICE. Yes, if Jules will but submit a request for any country on the current ARRL list, he will receive a certified QSL card by fax from an authoritative source, no questions asked! It couldn't happen to a more deserving person.

To Ron AB5KD, with affection and respect for his contest achievements, for his exuberant support of the Digital Journal and for his continuous supply of interesting columns and people, I send (wrapped in the RTTY by WF1B printout

of his WPX log) 5,000 FREE POINTS. Yes, if Ron is a few points short in any contest during the next twelve months he can receive up to that many additional points by fax from an authoritative source, no questions asked! While I doubt that he needs them, I'm sure no legitimate contesteer will question their use!

To Rich W6GG, with admiration for his persistence in correctly assembling some of the most detailed and demanding information printed in each month's Digital Journal (always in a timely fashion) and for his valiant efforts to break the handicap of the 'left coast' syndrome known to all California contesters (wrapped in unused propagation charts), I send 40 MINUTES OF QUIET AIR TIME ON 40 METERS DURING THE NEXT WPX CONTEST. Yes, if Rich will but configure this gift in the GMT parameters of his choice, he will receive this quiet-time certificate via fax from an authoritative source, no questions asked! Good luck, Rich.

To David KI6QE, our esteemed satellite expert, a staff addition for which we are filled with gratefulness, I send one BIRD. And while it may look like a parrot, quack like a duck and sing like a canary, it is actually a private satellite, responding only to David's beck and call. It will arrive, upon David's request by fax, no questions asked.

To Glenn W6OTC, with deep appreciation for his many contributions to this magazine despite a heavy work schedule and his tireless travels on behalf of the DX community, I send (with the concurrence of the UN if not the DXAC) ONE NEWLY CREATED ISLAND IN THE SOUTHWEST PACIFIC (prefix is VZ11). Upon Glenn's request, this island will arrive via fax complete with documentation that prevents operation by any other amateur or group, no questions asked. Keep us posted, Glenn.

To Steve N2QCA, with affection and gratitude, who, despite his busy schedule, shortens our learning curve in the new 32 bit world and who, during the wee hours of the night performs remarkable things on the IDRA Web Page, I send the new 'VIRTUAL' FIVE BAND BEAM. Yes, if Steve will but make the request he will receive via fax the newest antenna that, without hardware, soars above those power lines crossing his back yard and delivers a 10dB gain on any five bands of his choice, no questions asked. Here comes the Honor Roll!

To Paul W4ZB, in appreciation of a productive friendship and from one in awe of his ability to work around-the-clock, yet spend time making this a better magazine and organization, I send (via the Internet of course) a brand new 26 HOUR VIRTUAL CLOCK. Since he never sleeps, this will allow two additional hours each day for him to work his wonders on yet another series of articles or one more round of ideas for the Web Page!

To Peter TY1PS, with great affection, who visibly supports this magazine with an endless stream of ideas and criticisms (who also quite invisibly provides that oft-needed support and encouragement to the Editor of this journal) and who, despite a demanding workload, finds time to continually polish his Express software, I send (wrapped in old calendar pages) ONE EXTRA DAY EACH WEEK FOR ANY CONTIGUOUS THIRTEEN WEEK PERIOD! Yes, if Peter will but send in his request, he will receive by fax from an honorable source a certificate good for thirteen additional days in the calendar quarter of his choice. (Peter: we will discuss how best to use this free time!).

To Crawford WA3ZKZ, our best story teller, historian and good friend I send a most unusual gift, a 1912 THREE CYLINDER INTERNATIONAL HARVESTER TRACTOR. A what? Well, you see, despite Crawford's expertise in the radio world, he really loves old machinery. Upon his request, this will be shipped, along with our fond regards, from Iowa, express collect. Send pictures, Crawford!

To Jay WS7I, the renaissance man of the digital community, whose support for this journal takes many forms, and for whose friendship I am eternally thankful, I send the new TOWER DOUBLER, exciting new software that doubles the effective height of any tower, anywhere. Upon Jay's request the floppy disk will be sent from the source, no questions asked.

To Bill K9GWH, friend, contributor, supporter, Bill's unswerving loyalty to this publication warrants a special gift. It actually took a committee to discover the appropriate product . . . and you know how committees are. To Bill, with undying affection, we send one magnificent CLOVER IN THE BONNET. This electronic marvel, a totally self contained HF digital unit, fits snugly into the hat worn by the operator. To some, the hat bears a striking resemblance to a Viking's headdress, but we see no significance to this observation. Thanks, Bill.

To Peter G3IRM, writer, experimenter, steady contributor, wonderful correspondent, I send a special gift indeed. From the laboratories near the river Charles, I send a personal copy (complete with documentation, of course) of the very latest in digital modes, ICW, or INCOHERENT CW. This rapidly expanding form of RKC technology (random key click) works best with at least a 5KW amplifier. On occasion a good deal of this new sound can be heard at or around 14065. Just your cup of tea, Peter!

To Tom WO5H, another of our Texas discoveries, writes frequently and well about packet and has been a friend in need more than once. To him, we send the rights to a new invention call BBS, THE BBS BULLETIN SHREDDER. This new product, with but minimum input reduces bulletin traffic anywhere from 42 to 74 percent, based on actual tests. As soon as Tom requests this gift, it will arrive by fax, no questions asked, no answers given. May he use it well.

Bob W1VXV, the good friend from Maine, who says more in fewer words than most, who willingly tackles some of our more difficult assignments, lover of DOS, I send one copy of WINDOWS 97 (BETA) for his enjoyment and subsequent comment. If Bob will but request delivery, this product will be sent via fax, no questions asked. Of course, it's on the new 2 inch CD ROM, Bob!

And To Tom WA8DXD, last but certainly not least, my good friend and partner is this unending task; whose expertise, perseverance and hard work create the look and feel of the Digital Journal, whose diligence gets it in the mail at the right time, whose generosity gives us a place to hang our corporate hat and keep our corporate books, I send, with much warm and affection ONE DIGITAL GENIE IN A BOTTLE. Upon Tom's request, this phenomenal little gem will be faxed, no questions asked. Three wishes, Tom.

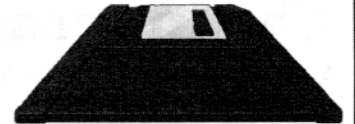
Finally, to the newest members of the staff, to our readers, our advertisers, our friends, we say Happy Holidays and a New Year filled with prosperity.

---HO HO HO de Jim N2HOS

SOFTWARE TOPICS

News & Reviews

by Bob Boyd, W1VXV • POB 571 • Kennebunkport, ME 04046



SNAPmax - New Improved Version

In February of this year I reviewed SNAP, a propagation analysis utility written by Crawford MacKeand - WA3ZKZ, and available from the International Digital Radio Association. This utility runs under DOS, calculates a signal to noise ratio for each hour of a 24-hour period for a radio path between any two sites, and then displays a graph plotting the results against time and frequency. I stated in that earlier review that I made comparisons of SNAP against MINIPROP PLUS by W6EL, and that I found the results to be consistently similar.

In the months since that review Crawford has been busy improving the product so as to provide even more realistic results, particularly for major DX, i.e., 10,000 km or more. The absorption loss calculation has been improved, and the auroral zone loss calculation is new. The result is better dB values for northerly stations when operating on near-polar paths. MUF is now determined by routines based upon newer 'Fricker' equations (from the BBC), and the consensus of opinion from the SNAPmax beta testers is that these give considerably better MUF figures, especially on long hops, than the previous version of SNAP. Antipodal focusing is now included, and according to the author this can provide a very real bonus on the longest paths.

Copies of two screens accompany this review. The first shows the user parameter screen where such things as the solar flux index or remote site are specified, and you will see that I have asked for path calculations between my QTH and Jordan. The

second screen shows the results of the calculation; not very encouraging on this particular day.

If you are a DXer, or if you need to maintain a schedule with someone in another part of the world, life is much simpler if you have the assistance of a good propagation prediction utility such as SNAPmax. This is especially true at this point in the sunspot cycle. SNAPmax is available only from the IDRA at a cost of \$40.00 (\$25.00 for upgrade from SNAP) (refer to the Software Store elsewhere in this issue for details on how to order).

73, Bob W1VXV

Fig. 1

```
          S N A P m a x  f r o m  W A 3 Z K Z
SIGNALS, NOISE and PROPAGATION - by - Crawford MacKeand (V.14)

D      Date                1 Nov 1995
T      Time GMT            19:14
S (N,K) Solar Flux & A Index  73          13
P      Power & Receiver Bandwidth  500 Watts 200 Hz
      Receive Noise Level      Urban      1
      Antenna Types, Local & Remote  3 El Beam Dipole

L      Local Site Name      W1VXV
      Local Site Location   43.2 North 70.3 West
R      Remote Site Name     Jordan (JY)
      Remote Site Location  32 North -36 East

Mode   Signal-noise ratio (S-units) shown vs time & frequency.
H      Hard copy is disabled.
E      Enter set-up, default & information menu

Enter option letter, or <SPACE> to compute, X to exit.
```

SIGNAL TO NOISE (S-Units)

- SNAPmax - by WA3ZKZ

```
1 Nov 1995  10.7 cm Solar Flux  73      A Index  14      Bandwidth  200
Local Site  W1VXV                Latitude  43.2  Longitude  70.3
Remote Site Jordan                Latitude  32   Longitude -36
Local Beam Heading 56 degrees      Remote Beam Heading 315 degrees
Great Circle Distance 8795 Km.
```

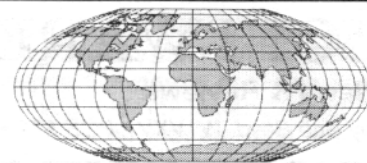
GMT TIME	0	5	10	15	20	25	30	35	40	45	50	LUF	MUF
0			00-										6.8
1			.0-									7	7.1
2			..-									7	7.3
3			..										7.5
4													7.3
5													7.2
6													7.1
7													6.8
8													6.4
9													6.5
10													7.1
11													8.8
12													10.2
13				*-									11.9
14				.01*-								12	13.5
15				.0122*--								11	14.4
16				.0112233*--								9	15.0
17				.012233343*--								8	14.2
18				01223221.								8	10.8
19				.1123221.								7	10.2
20				.012333210								6	10.3
21				.1123333*-								6	10.6
22				.01222*-								6	9.3
23				.011-								6	7.4

Fig. 2

The International Scene

A regular look at the odds & ends from around the digital globe

received from various sources



LETTER FROM BARTG

As a change to my other letters, which have generally been about data-comms or BARTG, I thought that readers of the Digital Journal would like to hear a little of the "commercial" side of ham radio here in the UK - the stores, rallies, magazines and suchlike. I shall accordingly split this Letter into three items. This split should keep things tidy and will also allow the DJ's hard-working editor to split this Letter across more than one issue if he so desires.

data-comms * the retail side of ham radio;
data-comms * the magazines that are published commercially;
data-comms * the rally scene.

PART I—THE UK RETAIL SIDE OF HAM RADIO

The retail side of ham radio, here in the UK, is not as active as over in the USA. I live in Nottingham, a city of about 450,000 people, and we have just one ham radio retailer. His store is a single room about 20 feet by 15 feet at best (and I'm not going to take a tape measure to check that estimate but it is likely to be on the optimistic side!). There are other stores that sell scanners and suchlike but only this one small store carries new equipment from the usual well-known ham radio manufacturers. If I want to go to a bigger shop then I'd have to travel at least 30 - 50 miles and I'd still have a very limited choice. Ham radio stores are not thick on the ground here in the UK.

We used to have a "tied retailer" situation - for example, Kenwood used to be imported only by Lowe Electronics and used only to be available from their stores. Store names were almost synonymous with the makes of radio that they sold and it was unusual to have all of the big makes in the same store. Very often one retailer would also be the (sole, perhaps) importer of a particular make. Things have changed and nowadays the importer is usually separate from the retailer; many stores now carry all the major makes so the customers do not have to drive around to find the right radio (but they might still have to drive around, or at least phone around, for the best deal).

"Grey" imports and "agents" were both to be found in the retail side of the UK ham radio scene. Let me explain these two terms for the benefit of anyone unfamiliar with them. Usually, your YaeWoodCom radio is imported into the country by the maker's approved importer. This importer would also carry a healthy and respectable stock of spares and service notes, etc. This importer would then supply the retailers who, in turn, sold the radios to the hams who were the end customer in this chain. Now, the importers clearly had to make their profit in order to survive and this was also true of the retailers.

Some retailers found that they could buy radios at a lower price by buying from an importer in another country than by buying from the appropriate importer in the UK. This was made true partly by the low volume of sales of ham radio equipment here in the UK - the importers had to make their profits over a relatively low volume of sales. Obviously, buying at a lower price meant the retailer could undercut his or her competitors or make more profit for him or herself. Items imported into the UK by a retailer that bought from other than the approved UK importer were termed "grey" imports. They might or might not have the correct specifications for use in the UK. They might or might not have a decent guarantee and they might or might not have decent service support.

It was not unknown for the retailer of "grey" imports to be a one-man business who simply took the customer's order (and money) and then shipped in one unit from overseas. Indeed, rumour has it that one prominent "lower prices than anyone else" retailer operated from the front room of a scruffy house and simply faxed orders through on an "as and when" basis to a contact over in the USA. No service facility and no replacement or stand-by stock if the supplied item was faulty. The approved UK importers usually knew the serial numbers of equipment that had been imported by themselves and, in some cases, they would not service nor supply spares for anything other than this equipment. Obviously, this was a move to deter hams from buying "grey" imports.

In general, the ham radio retail and import businesses here in the UK have sharpened up their acts and the "grey" import is now little found. Were "grey" imports of real benefit to the ham customers at the end of the chain? Well, sometimes the "grey" import meant that the ham could get new equipment ahead of the queue of customers waiting at the end of the approved importer/retailer chain. (I said that ham radio retailing is a low volume activity over here and this also means that the importers weren't always able to import as much as they needed in order to meet demand.) In addition, "grey" imports cost the retailer less so he or she could (so theory had it) pass on these reduced costs to the customer. In practice, this did not always happen and so, once again according to rumour, some retailers made their profits high and fast and then closed down leaving the customer with a radio that might not get serviced by the approved UK importer or (sometimes) by any of the approved UK retailers. The word "cartel" was sometimes muttered by those apparently in the know.

What of the "agent"? Well, these may have started out life as the person who happened to have a group of ham friends and a convenient sized room at the QTH. They would hold a stock of equipment for demonstration purposes and then act as a go-between between the retailer and the customer. It was not unknown for an agent to have, in turn, agents of his own. Once again, this all worked because of the rarity of ham stores over here in the UK.

As I said, the UK's ham radio retailers are now much like any other retailer though they are still thin on the ground. I believe that a lot of business is done by mail order and so many retailers (supported by the relevant importers) run adverts in the commercial ham radio magazines. This nicely leads to my next topic, next month.

DL2/DL2/DL2/DL2/DL2

Glenn data-comms AE0Q / V31RY submits the following after an exchange of letters with Tom Rink DL2FAK. It is interesting because it includes some new information about the Factor II unit.

Q) How much SRAM is needed for personal use, i.e. NOT for a dedicated HF-BBS system? How much is extra SRAM?

A) The standard data-comms 512k SRAM is more than adequate. It's almost all used for the built-in mailbox, with a small part used for storing individual settings and addressing. The price of the 2MB RAM upgrade is \$500 US.

Q) What is the DRAM (72-pin SIMM) used for? Does it speed up the operating system?

A) Current firmware V-1.11 does not yet support the Dynamic RAM. The processing speed of the system depends only on the power of the CPU and DSP, partly controlled by the clock frequency. RAM size does not affect the speed.

Q) Are the VHF Packet Modems available?

A) Not yet. The basic version with the TCM-3105 chip (1200/2400 baud) is expected to be on the market by the end of the year. The DSP modem will probably take somewhat longer.

Q) Many hams in the U.S. are using the HAL P-38 Clover units for RTTY contesting because of the superior copy of RTTY signals with its DSP modem. If the PTC-II DSP processor speed is slowed down for modes that do not require its full power (as mentioned in the Digital Journal Pactor-II article), will the PTC-II still offer better copy of RTTY signals than TNC's like the data-commsPK-232 and KAM?

A) Due to the adaptive DSP filtering, the PTC-II also allows an improved RTTY operation. RTTY, however, does not provide any error detection or even correction capabilities, thus the performance is still limited. An optimum through-put can only be obtained when using PACTOR-II, as the high processing power of the PTC-II is not used up in any other mode.

Then, Glenn adds, "The answer to my last question is a quote from the letter I received. I don't think Tom Rink is aware of the importance of DSP modems, particularly in RTTY contesting.

TY1/TY1/TY1/TY1

Peter TY1PS struggled through a grim situation last month. He was interviewed by some journalist or other about the very successful commercial communication business he and Volker TY1VH run (in many parts of Africa). The writer, not exactly an expert in the field, noted that some of the equipment used was typical amateur gear. So, without asking any questions, he assumed and told his readers that they were also using the amateur bands! An absurd thought because the commercial bands are not exactly in short supply in Africa. If that wasn't bad enough, though, some packet policeman picked up the story and broadcast a 'flame' all over the Germany packet network proclaiming that AMATEUR BANDS MUST BE KEPT FREE from such pirates as Peter and Volker. What a mess. Well, finally, the apology arrived, the story was withdrawn. But we know from experience that the 'apologies' are never read with the same interest as the original damaging article. Hopefully, the story will fade away, but if you run across any trace of it, please straighten out the individual or group spreading the false rumor. Stomp on the flames! And, yes, it will be some time before Peter grants another interview!

TIDBITS

These digital mailbox stations in Africa and the Middle East operate 24 hours a day (unless noted) on the mark carrier (LSB for Clover) frequencies listed. Courtesy WA8DRZ.

4X6SL Kuti in Petach-Tikva (Tel-Aviv), Israel (.ISR.AS) Win
AP 14068 (1800-0600z), 21071 (0600-1800z)

5N0FDR in Nigeria (.NGA.AF) Oth
P 14078

9K2DZ Abdul in Kuwait City (.KWT.AS) Win
A 7071 10128 14066 14070 14074 14076 14079 21076 21079 18105.5
24925
C 14066 14070.12

9K2EC Mohsin in Kuwait (.KWT.AS) Win
AP 7038 10145 14066 14071 14072 14080 18105 21071 21081

A4XWF

A 14075 14078 14079 14080 21075 21115 28075

C91BG Kent (SM4TFE) in Maputo, Mozambique (.MAP.MOZ.AF)
APL
A 7037 14069

CN8CX Roy in Rabat, Morocco
A 7041

OD5KU Elie in Beirut, Lebanon (.LBN.AS) Win
P 14067

S92ZM Glenn (AA3HZ) in Sao Tome (.STP.AF) Win
P 14062.87 14063.87 14065.87 14070 14073 14080 21063.87 21073
21075.5

SU1ER Ezzat in Heliopolis, Cairo, Egypt (.CAI.EGY.AF) Win/PCC
A 14070 14072
C 14072.12 14066
P 14070
(Weekdays 1500-2000z, Fri./Sat 0600-1000z)

V51NH Nico in Windhoek, Namibia (.NAM.AF) APL
A 14070

ZS5S Joe and Mary in Howick, South Africa (.ZAF.AF) Win
P 7036 7037 7040.85 14063.85 14069 14073 21063.85 21069 21073
C 7033 7043 14066 14071.1 14075.1 21066 21071.1 21075.1
X 3607 7043 10143 14109 21109
Beam EU/AF/NA H24 except: AS/OC: 0600-0800 1300-1500

ZS6KM Mario in Pretoria, South Africa (.TVL.ZAF.AF) Win
AP 14075 (0430-0700z) NA
AP 21075.5 (0700-1800z), 14075 (1800-2000z) EU

Peter G3IRM writes that Bill VE2IQ has changed his policy on sigma-delta boards for CCW. Nothing but kits are now available at \$49 US, plus \$5 airmail shipping anywhere. The COHERENT and SPECTRAL ANALYSER software programs are included. COHERENT now includes BPSK about which you will hear much more in a forthcoming CCW column. Bill can be reached at Bill de Carle VE2IQ, 29 Sommet Vert, St.-Adolphe d'Howard, Qc J0T 2B0, Canada.

Ron G3AAJ, one of the founders and the principal pillar of AMSAT-UK, who was recently awarded an MBE in recognition of his devotion to duty, has finally retired from one of his tasks. Effective with the August issue G6ZRU has taken over responsibility for OSCAR NEWS, their bi-monthly publication. This is an excellent 50 page magazine and is entirely devoted to the satellite theme. You don't join AMSAT-UK, you contribute each year. Most of the money goes to the construction of more birds but does include the magazine. The current minimum donation for North American members is about \$40 US. Information can be obtained from Mr. Ron Broadbent G3AAJ 94 Herongate Road, Wanstead Park, London E12 5EQ, England.

BARTG has agreed not to participate in the discussions regarding the future of CW, whether or not it will continue to be a part of the amateur licensing procedure. They see their mission as working with licensed amateurs who wish to get on the digital bands. Licensing requirement discussions fall outside of this focus. The discussions will continue to rumble across the land, however!



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



In late October I received an e-mail from our editor Jim, N2HOS, asking if I could fill in for Jules in this month's DX News. I was deeply saddened to learn that Jules had lost his wife a few days earlier. I felt honored that Jules had suggested to Jim that I might be called upon to contribute to this fine publication in his absence. This was a tough assignment, as Jules has been putting out an excellent column for the Digital Journal for some time now. Having no previous writing experience, I soon realized this was no easy task. Let's see what happens.

First let me introduce myself. Perhaps some of you may have seen my call across your screen while tuning RTTY. If not, that means you haven't turned your radio on in many years (hi). I am an active RTTY DX'er and contester. I have operated RTTY from such places as C6A, V2, VP2M, P4, and HK0 San Andres. I hold RTTY DXCC #249 and currently have 287 countries confirmed on digital. I was first licensed as WN9IVC in 1972 at the age of 14 and became a general class with WB9IVC two years later. I moved from Indianapolis to New Orleans (via 2 years in TF land) in 1979. I made my first ever RTTY QSO with EA7BBK in July 1983. I was using a home-brew TU with a board given to me by my father and elmer, George, WB9FAD. A Heathkit H-89 computer running CP/M with one of the original Yaesu FT-101's into a MiniQuad provided a very efficient beginner's RTTY station. From that point on, I became an avid digital operator. In 1987 I upgraded to Extra and received AA5AU. Having an equal love of CW, as I do for the "other" digital modes, I was lucky to be issued a fun call.

To prepare for this article, I reread Jules' columns for the last year. I was impressed that nearly every aspect of digital DX'ing was covered. There was so much information that at first I thought I would not be able to think of a topic. Then it occurred to me that perhaps a review of some of that information might be in order. There were topics discussed that are both interesting and important to any digital DX'er. Whether you are a seasoned veteran approaching RTTY HONOR ROLL, or an eager, curious newcomer, it is all there in black and white. Thank you Jules.

Reviewing the "most needed countries" List

In the September '94 issue, the Digital Journal conducted a survey of it's readers in regard to which countries they needed for RTTY DXCC. The results were published in this column in the January '95 issue. Forty eight digital DX'ers responded to that survey. Many of the operators that sent in their "needs" list were in the 300+ category, giving the survey real validity. From the results, we were able to come up with a list of "most needed countries". There were 45 countries listed in the top 20 positions, with some countries tied with others as far as being needed by the same percentage of respondents. Of those 45 countries, at least 14, possibly more, showed up on some form of HF digital mode in late '94 and '95. More impressively, of the 15 countries ranked in the top 10, five were activated on RTTY since the survey was taken. Having a third of the top countries "needed" show up at the bottom of the sunspot cycle is truly an amazing statistic. I thought this might be a good time to update the "list"

I asked Jim to post the listings of all the DXCC countries in this issue so another survey could be made. Bob, K0RC, offered to assist by supplying me with the program he used to compile the data and gave his OK for us to use the DXCC list he was able to squeeze onto a single page for the first survey. North Korea (P5) is not on the list. I will assume (I hope correctly) that P5 has not been on RTTY as of yet. The survey will be the same as last year. Please send your survey sheet to me at the address at the top, and not to Bob. Be sure to check one of the boxes for either *already* worked, or countries *need* to work. Note that when sending in your survey sheet, it makes no difference whether the countries you submit as "having" or "needing" are worked or confirmed. Some operators work DX for the fun of it and don't chase the cards. That is fine. What we hope to achieve with this survey is to get a good idea of what is needed most on our modes. January 31, 1996 will be the deadline. Everyone is welcome to submit, and a list of participants will be published with the results. Let's do better than 48 this year. I hope to have the results ready for Jules for the March '96 issue.

Heard Island (VK0) was tied with Yemen (7O) at the top of the list, needed by 100% of those responding. With the addition of North Korea (P5) to the DXCC list, there will no doubt be a three way tie for the "most needed country". I hesitated to make this statement at first. Heard Island was to be activated in November '95 by a multi-national group that includes Peter, ON6TT. Peter has taken a strong liking to RTTY and it was hoped that there would be "more than normal" digital activity from this DXpedition. However, as I prepared this article, the following message was posted on the Internet by team member Ralph, K0IR. It read, "The Heard Island DXpedition team has encountered transportation difficulties. The advance team inspected the vessel chartered by the group and found it to be unsuitable for the intended voyage. Rather than compromise safety, the group has elected to re-schedule the expedition for early 1996." We can only keep our fingers crossed on this one.

Congo (TN), which sat alone at the number 2 spot, was the prize of the year. In February, TN4U and TN2M were put on by the German team of DL7VTZ (Brigit), DL7VYL (Gerda), DL7URH (Tom), DL7URH (Ragnar), DL7VTM (Holger), and DL7VRO (Fritz). The group endured some frustration with local officials in obtaining permission to operate, but they succeeded. After meeting and talking with the group at the New Orleans International DX Convention in September, I found out that if you made a contact with them on RTTY, it was most likely with Brigit. She was the team's leading RTTY operator. "After 9 days of trouble with the local officials (secret police, police, duty, telecom) we finally got 2 licenses. During 4 days of operation a total of 13,177 QSOs on all HF bands and satellite were established." read the back of their QSL card. Digital modes are not mentioned here, but they made a worthwhile showing on RTTY.

In the #3 spot were Kermadec (ZL8) and Libya (5A). Both of these countries were active during 1995, but not on RTTY. G4MFW/ZL8 activated Kermadec in early July on SSB only. A group of Ukranian hams put 5A1A on SSB and CW about a week later. As happens on many occasions, RTTY DX'ers could only wonder what could have been had

RTTY gear been brought. There are plans in the works for a full scale ZL8 operation possibly in early 1996. The operation from 5A has not yet been approved by ARRL for DXCC, but it is encouraging that the operation took place at all.

In the fourth spot were Bhutan (A5) and Kerguelen I. (FT8X). There was no RTTY activity at all from these two countries in 1995. In September of 1994, FT5XJ was active on RTTY and worked by many in the USA fifth call area. The cards did not arrive until after the survey results were published. So it will be interesting to see what the new status of this country will be. It has been reported by many reliable sources, including this column, that there will be activity from Kerguelen for a prolonged period starting late '95 by a French operator that will be stationed there for one year. Refer to the October '95 issue for more information on this one.

The South Shetland Islands (VP8) was alone in the fifth spot. There were two stations on RTTY from the South Shetlands in 1995. There was quite a stir when DP1KGI came on from King George Island in February. VP8CQS had been active since the start of the year on mostly CW, and was waiting to receive RTTY gear shipped from the International RTTY DX Association (IRDXA). In April, Andy, SP2GOW, started up on RTTY at VP8CQS and is still going. No cards have been received for the DP1KGI operation, but VP8CQS cards have been arriving via SP2GOW. Andy's XYL has been serving as his qsl manager.

Tunisia (3V) held the sixth spot alone. The '95 Japanese effort from Tunisia was a complete success. In June, 3V8BB was active on RTTY. The station is still active with several different operators. Although there has not been any RTTY since June, it is great to see any activity from this one. Crozet I. (FT8W) and Iran (EP) were seventh and eighth, respectively. No RTTY activity has been reported from either of these two. The last known RTTY operation from Iran was the 9D2UU effort in November of 1993 that caused an uproar over the fact they did not send in the proper documentation to the ARRL, and thus is not good for DXCC.

Tied in ninth place are Pagalu I. (3C0) and Mt. Athos (SV/A). 3C0 was not active. But Monk Apollo, SV2ASP/A, has been active occasionally during the year. In October, SV2ASP/A was very active at the start of the month and even worked into the west coast USA around 1630z on the 5th. It's nice to see that Monk Apollo enjoys RTTY.

Rounding out the top ten were Syria (YK) and St. Peter/Paul (PY0). The YK0A DXpedition in November '94 made a big dent in the demand for this one on RTTY. There was no activity from St. Peter/Paul this year.

Other rare or semi-rare countries active on digital since the last survey are (not in any particular order): Nepal (9N1AA, 9N1ARB), Swaziland (3DA0CA), Qatar (A71A, A71CW, A71BH), South Georgia (VP8SGP), Kampuchea (XU7VK, XU95HA), Vietnam (3W5FM), Western Sahara (S0RASD, S07URE, et al.), Easter Island (XR0Y), Burundi (9U/F6IQA), Lord Howe Island (VK9LZ), Conway Reef (3D2CU), Sable Island (CY0TP), Guyana (8R1TT), Ghana (9G5JR, 9G5MB, 9G1BS), Angola (D3T, D2EV), Rwanda (9X5EE, 9X/ON4WW), Macao (XX9AS), Chatham I. (ZL7AMO), East Kiribati (T32A), Norfolk I. (VK9NS), Antarctica (VIOANT, VK0FPS), Djibouti (J28JJ, J20UFT), Comoros (D68UY), Montserrat (VP2MFM), Revilla Gigedo (XF0C), Zaire (9Q5TT), Malawi (7Q7AN), Geneva (4U0ITU), Aland I. (OH0/DL5FF), Tuvalu (T20XC), Palau (KC6YK), China (BY7WGL), Juan Fernandez I. (CE0Z), Ethiopia (ET3SID), Malagasy (5R8KH, 5R8EU), Oman

(A45XC, et al.), St. Paul Island (KW2P/CY9, et al.), Sri Lanka (4S7/JH4FM), U.A.E. (A61AD), Zimbabwe (Z21HD), Mauritania (5T5JC), Namibia (V51P), Taiwan (BV7WB), and Bangladesh (S21YE). This list is not complete by any means. But it goes to show that despite this part of the solar cycle, DX on the digital modes was plentiful.

The "woulda, coulda, shoulda" List

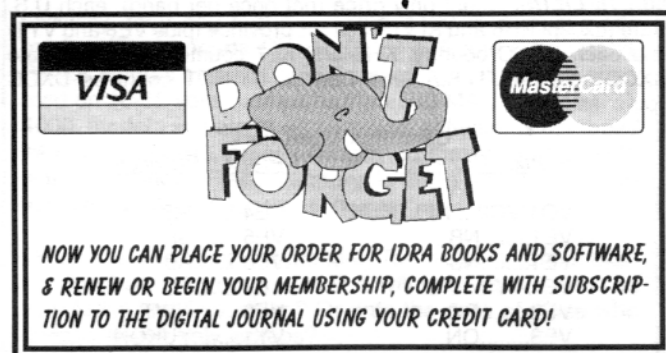
Not to overshadow the tremendous year we had on the HF digital modes, there were a few that we missed for one reason or another. Topping off the list is Cocos Island (TI9). Jose, TI9JJP was active three different times from Cocos I. since Oct '94. On the first two trips, inquiries about RTTY were answered with "next trip". Finally on the 3rd visit to the island in October this year, his answer was just plain "no RTTY". Tokelau Island was activated by Ron, ZL1AMO, as ZK3RW in June. Ron, despite not being overly fond of the "slow" RTTY mode, has given us many new ones from the Pacific. He stated that his KAM was broken, and left it behind. After much anticipation, Myanmar (XY) showed up on the air in October for what was to be two separate all-out DXpeditions. Of the two groups, XY1HT had advertised RTTY. Pleas for information of any RTTY activity from this group posted on the Internet yielded no positive responses. The XZ1A group, headed up by the famous Martti Laine, OH2BH, had a tremendous effort, working into Europe and NA several days on 20 meter CW. With the Myanmar government opening up to amateur radio, an RTTY operation can't be too far behind. And with Martti Laine in Myanmar, perhaps North Korea is on the horizon. 1996 holds promise of some of those 'rare' ones we need showing up on the digital modes.

What to expect in 1996...

With the debate raging over the where we are in the sunspot cycle, one thing is for sure. More and more DX stations and DXpeditions are going digital. HF propagation has not had a major impact on working DX on the digital modes. In fact, with the introduction of DSP, digital HF DX'ing has not been easier. It's hard to imagine that 1996 can be better than '95, but it just might be. And remember, we are at the bottom of the sunspot cycle. And, as shown by this past year, DX doesn't sleep with the sun.

I apologize for not including a 'DX Doings' this month. So much time was spent on researching this column that I didn't have much time to tune. How Jules does all this is amazing to me. The influx of information from the packetcluster and Internet is so great, that combining it all together can only be complete by actually being there tuning the bands. Jules seems to do it with ease. His signal is ever present on RTTY. He is the epitome of a true blue digital DX'er. We are all looking forward to his return.

Season's Greetings, 73 de Don, AA5AU



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Contesting

Coming Events and Awards

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



— RTTY Contests - Coming Events —

Date:	Contest:	
DEC 9-10	TARA RTTY Sprint	(USA)
JAN 6-7 '96	ARRL RTTY Roundup	(USA)
FEB 3-4	IDRA WW Digital WPX	(USA)
FEB 17-18	DARC HF RTTY (Part 1)	(German)

— Reminders for Logs —

JARTS WW RTTY Contest (Oct 21-22) log entry deadline is December 31.

Mail logs to:

JARTS Contest Manager, Hiroshi Aihara, JH1BIH
1-29 Honcho,
4 Shiki Saitama 353
JAPAN

— — COMING UP — —

— ARRL RTTY ROUNDUP CONTEST — January 6-7, 1996

Sponsored by ARRL (Ref: December QST)

CONTEST PERIOD: Starts at 1800 UTC Saturday and ends at 2400 UTC Sunday. Operate no more than 24 hours of this 30 hour period. Two rest periods (for a combined total of six hours) must be taken in two single blocks of time, and clearly marked in the log.

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

Modes: Baudot (RTTY), ASCII, AMTOR, or Packet (attended operation only). Cross-mode or cross-band QSO's are not permitted.

OPERATOR CLASSES:

- Single op, unassisted, all bands:
 - less than 150 watts output.
 - more than 150 watts output.
- Multi op, single transmitter. Once station has begun operation on a given band, it must remain on that band for at least 10 minutes.

EXCHANGE: U.S. stations: RST and state. Canadian: RST and province. All others: RST and serial number, starting with 001. Both stations must receive and acknowledge complete exchange for QSO to count. Neither cross-band nor cross-mode QSOs are permitted. Packet QSOs through digipeaters or gateways are not permitted.

QSO POINTS: Count one point for each completed QSO (anyone can work anyone). A station may be worked once per band for QSO credit, but not for additional multipliers.

MULTIPLIERS: Count only **once** (not once per band), each U.S. state (except KH6 and KL7), each VE province (plus VE8 and VY1) and each DXCC country. KH6 and KL7 count only as separate DXCC countries. U.S.A. and Canada do NOT count as DXCC countries.

Canadian Multipliers:

Prefix...Province	Prefix...Province
VO1/VO2...NFLD/LAB	VE4.....MB
VE1.....NB	VE5.....SK
VE1.....NS	VE6.....AB
VE1/VY2...PEI	VE7.....BC
VE2.....PQ	VE8.....NWT
VE3.....ON	VY1.....YUKON

FINAL SCORE: Total number of QSOs times total multipliers.

AWARDS: Certificates will be awarded to: Top scoring low power and high power single operators and multi-op scorers in each ARRL/Canadian Section; Top low power and high power single operators and multi-op scorers in each DXCC country (other than W/VE); each Novice and Technician entrant; each entrant making at least 50 QSOs.

LOGS and SUMMARY: Logs should contain the suggested standard format: BAND, MODE, DATE/TIME, ON/OFF TIMES, CALL-SIGN, EXCHANGE SENT/RECEIVED, MULTIPLIERS (marked the first time worked). Entries with more than 200 QSOs must submit duplicate check sheets (an alphabetical listing of stations worked). A Summary Sheet must show: claimed score tally, class of operation, your call, name and address. Multi-ops stations please include names and callsigns of all operators.

DEADLINE: Entries must be postmarked no later than 30 days after the end of the contest (February 8). Mail entry to:

ARRL RTTY ROUNDUP
225 Main St.
Newington, CT 06111

RECOMMENDED OPERATING FREQUENCIES (MHz):

3.580 to 3.625	14.070 to 14.095
7.025 to 7.040 RTTY DX	21.070 to 21.090
7.065 to 7.095	28.070 to 28.150

COMMENTS: The Roundup is the most popular domestic contest. It's much like the SS contests on CW/SSB. To make a high score one must concentrate on high QSO rates and lots of CQing. There are no band multipliers, meaning that once you work Utah on 15M, you will not get another multiplier for working Utah on any other band. If maintaining a high rate is just not your thing, you can set yourself another goal: see if you can work all states or provinces in the 24 hour period. In past sessions, all states have had RTTY stations on the air. This goal is especially exciting when using contesting software, such as the the WF1B RTTY contest logging software. It automatically keeps track of states/provinces worked and always shows you on the receiving screen whether you need that particular station for a new multiplier.

The Roundup is one of the few RTTY contests that has a low power category. This means that there should be more activity, primarily on the high bands. (Low power stations have a harder time cutting through the D layer absorption and QRN (static) on the low bands.) Those operating low power RTTY should pay close attention to picking out a frequency to start CQing. On RTTY it is difficult to find a clear spot on a crowded band, and when running low power, you just get clobbered easier when you're a bit weaker. You can't always assume that everyone has sharp filters in their radios. And on the high bands you can't always hear stations within the skip distance of your QTH. Sending a "QRL? BK" is a good way to interrogate whether the frequency is in use, just as in CW and SSB. It really helps when skip distances are long. And it shouldn't upset anyone - unless the frequency IS in use, and the time between the "QRL?" and the CQ is less than one second!

— Digital Journal WW WPX Contest — 10-11 February, 1996

from 0000 UTC Saturday to 2400 UTC Sunday (48 hours)
Sponsored by IDRA Digital Journal (Ref: WS7I)

I. CONTEST PERIOD: Only 30 hours of the 48 hour contest period is permitted for Single Operator and Multi-single operator stations. Off periods must be a minimum of 60 minutes in length and be clearly marked in the log. Multi-multi operator stations may operate the full 48 hours.

II. OBJECTIVE: The object of the contest is for amateurs around the world to contact as many amateurs in other parts of the world as possible during the contest while using a digital mode. **RTTY, Amtor, Pactor, G-Tor, and Clover** are all welcome. No cross-mode QSO's are allowed.

III. BANDS: 3.5, 7, 14, 21, and 28 MHz. No WARC bands.

All the rules for the WPX contest will appear in the January issue of the Digital Journal. In the meantime, if you need the details they will be up on the Web Page by the time you read this. Or you may contact either Ron AB5KD <ab5kd@aol.com> or Jay WS7I <jayt@comtch.iea.com> for the latest information.

Both Ron and Jay are particularly interested in hearing from anybody who wishes to be a sponsor of a plaque. Many choice awards are still available for a personal, company or club award. The cost is a mere \$50 and these handsome plaques will adorn the walls of the winner's shacks for years to come. Join in now and help sponsor what is surely one of the great annual RTTY contests.

You can't win if you don't enter!! See you in the pileups.

--+ Contesting During the Doldrums --+

The 11 year sunspot is now at its' minimum. Our precious reflective F Layers aren't getting their fair share of ionization during these periods. Couple that with the D layer absorption factors that plague us and we have an on-going dilemma - namely: Where did all that DX go? Unless you have a VERY quiet QTH (no man-made noise or lightning-caused static) you'll hear VERY few signals on 10M. During the JARTS WW RTTY Contest, 15M was quite marginal, with most signals really weak. I was calling CQ on 15M in mid-afternoon, having a small run. Suddenly, after 5 or 6 minutes of CQing gave no answers, I looked around and found I was CQing on a dead band! Absolutely NO stations... Weird... Went back to 20M for a while, and came back to 15 an hour later to find the band open, with dozens of stations working each other. That happened several times during the contest.

So, that leaves 40 and 80M for lots of DX QSOs at night - right? Well, not exactly. It is true that 40M can give you some real surprises, especially if you prowled around 7025 to 7040 kHz where the DX is. I worked a few JAs and DX stations, along with arousing a few CW hecklers. I heard no europeans on 40M. Nor did I hear anyone working europe either. It still bothers me to work DX down there, creating unintentional QRM that CW ops can't seem to figure out. Fortunately, they can't read RTTY so they don't know who I am. Incidentally, for those new to RTTY, USA stations have 7080-7100 to claim for domestic QSOs. But foreign SSB ragchewers claim it too. Wonderful.

And what about 80M? Everyone was weak. My best DX was K1IU, from 2400 miles away. (Hey, at least he gave me a new mult!) I checked out 3520-25 kHz for the JAs but never heard any. (Last year I worked a few.)

That leaves 20M to do the yeoman's work. But even 20M was stubbornly resistant. I worked very few europeans. Had a number of JA QSOs but the best band for JAs is 15M - when it's open. I think that JA ops are required to have a higher class license to operate on 20M, making less JAs available.

Ten meters gave one big surprise: VK9NH/VK4 showed up on Sunday afternoon for about 20 minutes - the only out-of-state signal I heard on 10M.

For me, JARTS turned out to be a domestic contest. The poor propagation forced it that way. All signals become weaker. Though there were a few DX openings, they were weak, short, and erratic. When propagation conditions are poor and inconsistent, there are fewer stations on the air to work. Those with noisy QTHs simply have to give up.

I predict that next year will be better... Sunspots will come back, and I will be one year older. One year older may not be better, come to think of it... But we'll all have spots!

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

P.S.

*Drop me a line with an idea to share,
Or, drop me a line with an item to air.
Drop me a line with anger to bare...
But don't drop ME... 'cause I care!*

New Products

RITTY 1.0

is a DSP Radioteletype system developed by Brian Beezley K6STI. The software combines with a 16 bit Sound Blaster card to produce a high performance FSK modem. The product uses advanced digital signal processing algorithms but does not require DSP hardware. RITTY uses the sound card for analog input/output and optimized assembly language for speed so it can run right in your PC.

RITTY requires a 386/40 or better, math co-processor, VGA and a 16 bit Sound Blaster card. It is important to note that other brands will not work with the program. The price is \$100 (plus \$5 for shipping DX). Visa, Master Card, Discover cards as well as cash or US checks are acceptable.

Although RITTY eliminates the need for demodulator hardware, its primary attraction is high performance. RITTY. It can recover weak signals ordinary terminal units can't copy. Since RITTY does not use an input limiter it can detect signals buried in the noise and QRM. The numerical flywheel implemented by RITTY locks the timing of incoming characters and allows the program to take full advantage of the processing gain of its matched filters.

Tuning is a snap since RITTY utilizes a true FFT spectral tuning indicator which is easier to use than a scope and provides more information. You can easily determine the shift of any signal. Finally, RITTY generates a continuous-phase 16 bit sine-wave AFSK. It's said to be cleaner and more accurate than the FSK found in most transceivers. The shift automatically tracks changes you make in receive shift so you'll answer a 200 Hz call with 200 Hz shift. RTTY does not use FSK or PTT lines. It needs just two audio cables to your transceiver.

For more information or to order, contact K6STI at 3532 Linda Vista, San Marcos, CA 92069, 619-599-4962.

VEST POCKET PCI-4000/M?

Well, not exactly, but almost! HAL Communications announced the DSP4100 which has all the features of the PCI-4000/M but puts it in small tightly shielded RF enclosure. Hook it up to the serial port on your laptop, load any software (HAL, RagChew or Express 3.01) and you have all modes to go!

Officially, they say that "... the 4100 is a multi-mode modem that supports Clover, CCIR-476 and 625 SITOR, Pactor, Baudot and ASCII FSK waveforms. It may be operated on 10-18 volts (uses less than 500 MA). Like the PCI-4000, modem waveform and protocol software is uploaded into the DSP4100, greatly simplifying the addition of software upgrades. Flash memory is used to assure non-volatile retention of loaded software."

Of course, it is designed primarily for the commercial market, but how long do you think it will be before it finds its way to the first Dxpediton? Or onto the desk of those who choose to use only laptops?

Beedle Beedle

A series of digital snippets

by Crawford Mackeand, WA3ZKZ

115 S. Spring Valley Rd. • Wilmington, DE 19807



My summer event this year was not in ham radio. We took a bus trip around Europe looking at private collections of antique gasoline engines and related museums. It was an experience to see the great ideas of our grandfathers, many still workable, but almost all now bypassed by commercial technology. No one today would build a hot bulb oil engine, although they ruled the roost for a few years. If you have never been to an engine show in the USA, I recommend it. You may even want to join in, like me, and if the bang bang whoosh whoosh bang bang whoosh bang of a hit and miss engine doesn't fascinate you, I'll be surprised. But these older machines are good learning tools. It is much easier to learn how a gas engine works, by studying a 1920 Alamo or a 1910 Fairbanks than by looking under the hood of a 1996 Chevy!

But to the point. It made me think about older technologies and their place in the world. Some are still viable and some are not. Some are compatible with today's needs and some are not. We see the same in radio. No one would build a 1920's crystal set for its performance but it may be a great teaching tool. There is, to pursue the analogy, much to be said for learning the ropes of digital amateur radio, in following the

progression of CW, RTTY, AMTOR, PACTOR. All of us understand how CW works, and I think very few fail to understand RTTY. On the other hand, I'll guess that many of us have used AMTOR as a working tool and not fully known what makes it tick, and very few of us have a real in-depth grasp of how the wheels go round in PACTOR, Clover etc.

It seems to me therefore that we have a real selling point in amateur radio. This is the only place where one can still do it all, where the full learning curve of the radio art and technology can still be practiced. And I think that this has to give us an edge over the professionals. But maybe they already see this and are here with us. After all who could doubt the professionalism of the designers of the latest round of digital systems? But on the other hand, who could deny the comfort for many of us in an old fashioned RTTY QSO? There is merit in being able to say, "I know what I am doing and I am happy doing what I know."

Now who is going to organize a bus tour to look at vintage radio collections? Plenty in the USA. It just might fly!

De Crawford WA3ZKZ

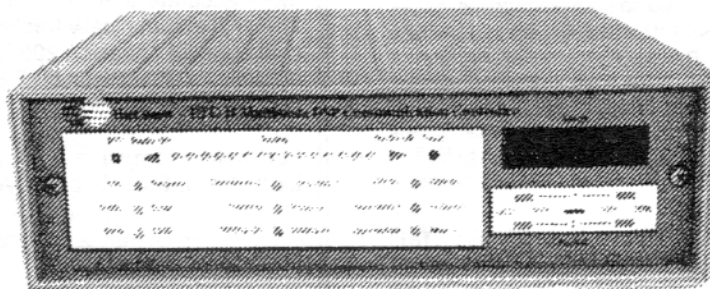
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The Contest Chair

Hints, Tips & Inspiration for Better Scores

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



Hello Contesters and DXers. Here it is December already and I wish all of you a very Merry Christmas. Most important, though, December brings one of my favorite contests into focus. The Tara RTTY Sprint, this little 4 hour contest is full of action from start to finish. It's a blow and go for the full 4 hours. It's also in a time slot where DX stations can get in the on action and have fun at the same time. We hope to see a bunch of you in the pile.

This month we visit with Eric Heikkinen OH2BBF of Hanko Finland. Eric is 50 years young, first licensed in 1962. In the sixties and seventies he spent seven years at sea as a merchant and tanker vessel Wireless

Operator, then several years at Helsinki Maritime Coastal Station, and finally ended up at his present location at Hanko. Here he was the Chief operator of a small coastal radio station until it closed in 1988. Since then he's been self-employed, DT-Publishing running a one-man business. Eric is happily married and has a 14 year old daughter.

Eric also uses calls like OH0BBF and on certain occasions OJ0/OH2BBF. He says he isn't really a dyed-in-the-wool RTTY freak, and says the main reason he operates RTTY from OH0 and OJ0 is by "popular demand". (Note: Eric we "DO" appreciate it.)

During his Merchant Marine years he missed a lot of DX, and the same applies to his time at Helsinki with antenna restrictions. He has been chasing DX seriously for only twelve years. His home QTH is now a small city lot with a 16-meter (52.5 Ft.) telescoping tower with a Cushcraft A4S on top. The other bands are covered by a 80m horizontal Sky-Loop.

His present rig is an IC-765 with an IC-2KL-(with the automatic tuner AT-500). He is connected to the Helsinki Packet Cluster system. On packet he has a dedicated small notebook computer running British

Turbolog software. This system enables automatic DX-alerting if missing band-mult is reported, together with instant QSY to the DX frequency by pressing F7 (the linear and tuner follow automatically). He does enjoy this system in spite of the low output power. He has used larger linears, but can't wait the three minutes it takes to warm up a pair of 3CX800's. The larger amps also used to set off his neighbors burglar alarm, not to mention local TVI.

Seven years ago he joined the OH0 Brando scheme, a group sponsored by five hams who use the site on a time share basis. Eric replaced Olli OH0XX who moved to Spain. Some of the other guys sharing this famous OH0W QTH are Martti OH0BH and Ville OH2MM. As you surely know, they do contesting with "blood taste in mouth". Eric says he's not like these champions, he prefers "relaxing and big pile-upping." No stress when he operates, he does it because it's fun!

He has made about 50,000 QSO's as OH0BBF, about 95% on CW and 4% on RTTY. He doesn't care for SSB operation at all. All bands from 6 to 160 meters have been activated. The RTTY activity is fairly new idea, he's been on RTTY Mode only the past three years. This includes the WAEDC RTTY contest in '93 and the BARTG contest in '94. Usually he has Rico OH2IC as a second op, but the BARTG contest was a single op effort. He finished 6th WW in BARTG'94..

Eric says it's a pity that the Scandinavian Activity Contest SSB collides with CQ/DJWW RTTY Contest. The SAC is considered

an important one, and he can't see any opportunity to use the OH0 station for RTTY at that time.

The antennas at Aland Island make operating from there a pleasure. Stacked 4-elm long-boomed monobanders on 10-15-20, a three element beam on 40m, switchable full-size 80m slopers in four directions and an inverted V on 160 make up the inventory. There are two rotation towers, 120 and 100 feet. Eric says the biggest problem is the high winds in wintertime. Each summer the antenna farm needs considerable repair and maintenance.

In November of '93 Eric joined OH1VR in his Market Reef CQWW CW S/B 80m expedition. The building that housed the RTTY station was an open door hut, which was built for saving the lives of ship or boat wrecked survivors. The trips to Market Reef were made by helicopter as the rough seas seldom allow landing by boat. Eric worked some 1200 QSO's on 15 and 20 meters CW only. In May of '94 they did it again, this time he had a KAM Plus TNC with him. There were a few stations on the air, including

Steve AC6T. Eric didn't have access to the 20m beam, so he quickly built a 20m sloper dipole to run RTTY. With conditions being at the bottom of the cycle there were only a few W's and JA's logged. Total number of QSO's logged were 250, though he really did try.

I asked Eric to tell us his likes and dislikes of RTTY contesting. Eric says he likes RTTY by WF1B. When he first tried RTTY from OH0 with a Pk-232 and Procomm Plus. It was terrible with all the CTRL-commands. Then he bought RTTY by WF1B. This changed everything and made RTTY a real pleasure out of what used to be a pain. He now uses a KAM-Plus TNC (mainly because of the smaller size and lower current consumption).

He says as a pile-up manic and a small scale contester, he doesn't like to work all those Europeans, who shoot him all their computer buffer files, telling their life stories plumb down to shoe sizes. Even in a contest, there are unbelievable stories about how some stations pollute his screen. He also dislikes all the RYRYRY's during contests.

I would like to thank Eric for his help in preparing the article. Next month we will visit with Sarkezi Arpad YU7AM in Yugoslavia.

The next three contests:

Contest Dates Start Time End Time Operating Time

Roundup Jan 06-07 1800 UTC Sat 2400 UTC Sun 24 of 30 hrs.

WPX Feb 03-04 0000 UTC Sat 2400 UTC Sun 30 of 48 hrs.

BARTG Mar 16-17 0000 UTC Sat 2400 UTC Sun 30 of 48 hrs.

BARTG Contest is considered by many to be Europe's best contest. Lots of activity from all parts of the globe. A true classic in RTTY contesting, I'm sure you don't want to miss this one. So mark your calendar.

Until next time, 73 de Ron AB5KD

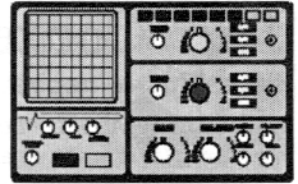
"Remember"

*Big antennas high in the sky work better
than little ones close to the ground...*

Tuning Indicators for RTTY

and other digital modes

by Bill Henry, K9GWT
PO Box 365 • Urbana, IL 61801



RTTY TWIST SCOPE - More Information

Since writing Part 2 of this series, I've come across more information - and done some more experimenting with the "RTTY Twist Scope" circuit. Here's what I've found:

1. First, let's credit Bruce Meyer, W0HZR, for his pioneering work on this circuit, described in the November, 1954 issue of *RTTY* magazine (pp 2-4; later called *RTTY Journal* and now *Digital Journal*). Bruce and Clayton Cadmus (KA0GKC) have since updated the details in their article in the Spring, 1993 issue of *Communications Quarterly* (pp 45-50).

2. In Figure 3, the value of the series resistor in the tuned circuit is incorrectly shown to be 12K (12,000 ohms). While this might have worked well with tube voltages and 850 Hz shift RTTY in the 1950's, this value does not produce a very useful display of present parameters. Experimentally, I find that R values between 33 and 1000 ohms work well - more on choosing this resistor in a minute.

3. I find that, in all cases, the voltage output to the "X-Axis" (horizontal) is 1/10th the level of that from the "Y-Axis" (vertical) output. New Figure 3a therefore shows two additional OP-Amp's with the voltage gain of the X-Axis amp set to 10x.

4. Tune the circuit by connecting a sine-wave generator to the input and an AC voltmeter or scope to the HORIZ output. Rotate the signal generator frequency knob through the range of 1000 to 3000 Hz. You should see a voltage null at some frequency, hopefully near 2210 Hz. Adjust the value of "C" so that the null is at exactly 2210 Hz. If your toroid has a value of exactly 88.0000 mHy, C should be exactly 0.058935 uF. It's not a perfect world and telephone loading coils are not precise gadgets. Mine measured close to 87 mHy. A parallel combination of a 0.056 and a 0.0056 uF Orange-Drop capacitor tuned my coil right to 2210 Hz.

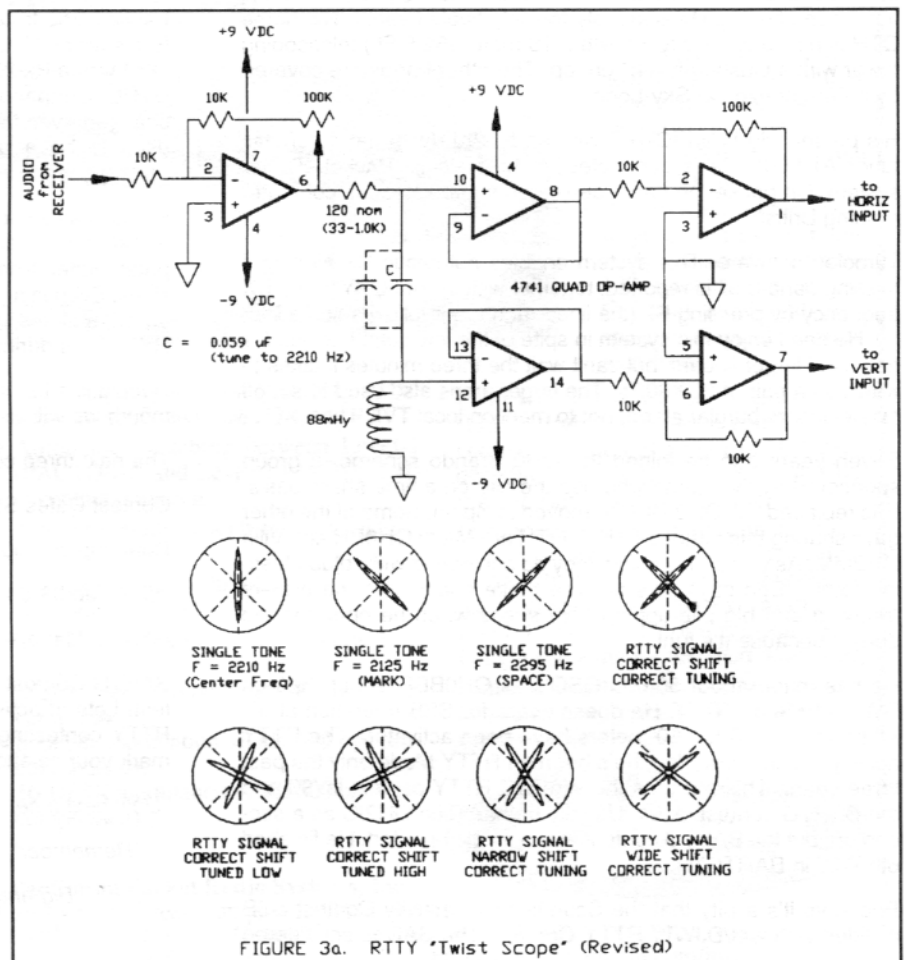
5. The series resistor sets the "Q" of the series tuned circuit and therefore the "frequency sensitivity" and tuning range of the indicator. When the resistance value is high (1000 ohms, for example), wider shifts will be displayed - 400 or 500 Hz to produce ± 45 degree ellipses. With the resistance set very low (120 ohms or less), it takes only 150 to 200 Hz shift to produce the ± 45 degree change in ellipse position. Thus, the amount of "twist" is most sensitive when a low value of R is used. In addition, low R values also produce the highest output voltage levels to the scope - more scope gain will be required when high values of R are used (wide shift case).

Personally, I find that a resistance of 120 ohms or so provides a very accurate and easily used display of standard 170 Hz shift RTTY signals. Incidentally, 200 Hz shift signals are very obvious on this indicator. When will these

guys "get with the program"? 170 Hz shift is the standard for RTTY - and AMTOR - modes. Oh well, this indicator will show the best tuning you can get on these non-standard signals.

6. The "RTTY Twist Scope" indicator is very noise, bandwidth, and amplitude sensitive. When the "wide" SSB receiver filter is used, it can be very difficult to see your desired signal in all the display mess caused by interference and wide-bandwidth noise. The situation improves considerably when a 500 Hz bandwidth receiver filter is used. Also, this indicator is not too useful for very weak signals; noise tends to hide the desired RTTY signal. AGC and/or hard limiting followed by a bandpass filter ahead of this circuit will help weak signal performance a lot, but by the time you get all this done, you will have built the most important stages of a good RTTY demodulator! If you can into your demodulator, pick-off the Twist Scope input signal after it has passed through the input filter and gain control stages.

This is a neat gadget, worthy of some serious tinkering this winter. Give it try and let me know what you discover.



More Info on RTTY Tuning

by By Hal MacArgle W8MCH/AFA2YY • RR 1 Box 83-J • Five Forks, WV 26145

Tuning of two-tone digital signals on the HF bands has, and I suspect always will be a challenge. There are many schemes published but as an inveterate soldering iron type, I wanted to throw together something simple and quick. The scheme sketch included with this article worked for me. And it was simple because it could be used with any radio using an audio output jack, speaker or headphones.

The final project had two jacks fitted with the radio audio output plugged into one and the speaker in the other with the tuning part bridged across this line.

Basic component list follows:

- 1—LM324N Quad OpAmp
- 2—LM3914N LED Driver
- 1—10K Pot, audio taper preferred
- 20—Jumbo LED's, diffused type, color user selected (optionally, you can use a 2 X 10 pre-manufactured unit
- 1—7805 regulator
- 2—1N914 diodes
- 2—88mh telephone surplus inductors
- 1—suitable enclosure
- 1—12vDC wall transformer—100-200ma rating okay.
- Plus assortment of resistors and capacitors
- Vector board, clips and wire.

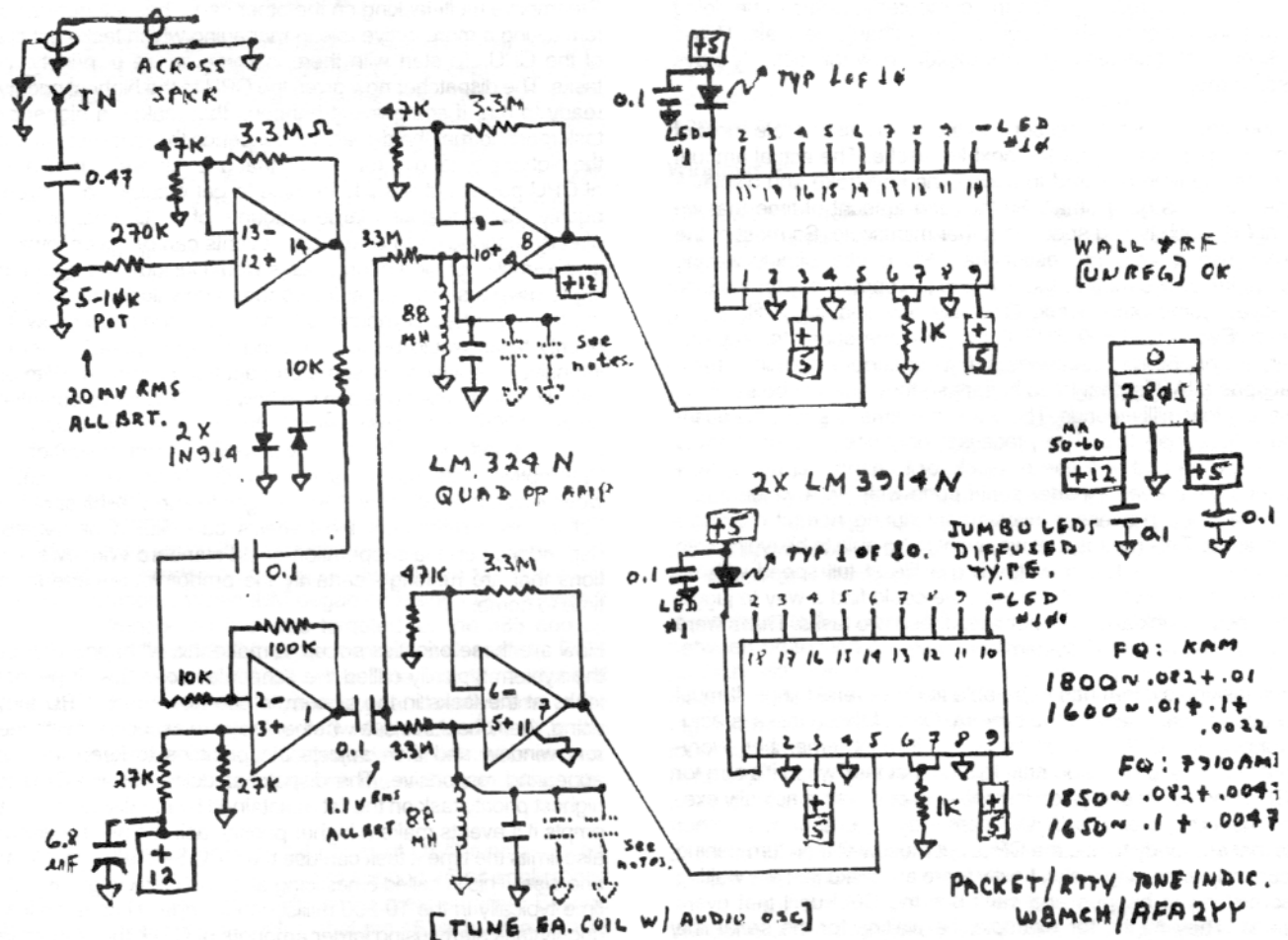
Construction should not be critical but the tuning of the coils could be without an audio oscillator available. I have noted the capacity used for two popular tone pairs which should work as long as the capacitors were good ones with low tolerance. Since the curve is quite steep, tuning with an accurate oscillator/frequency counter is best.

I found the best placement of the LED's was in a horizontal plane in two banks, immediately over each other. The tone bursts are quite fast and my eyes slow, so quick observation is necessary. Since the LED's can be wired in any orientation I found that zero level for both sets on the same left side worked best for me, with increased levels lighting LED's to the right.

The only possible scarce component may be the 88mh coils, familiar to old RTTY types. And at one time they were ubiquitous and in any surplus outlet. I'm sure Digikey or other vendors have something close that can be tuned to resonate at the desired tone frequencies.

I hope this scheme is some help and I would be glad to enter into dialog with anyone who may have queries. I can be reached at <w8mch@w8sp.wv.usa.noam> or on the Internet <haltec@squeaky.free.org>.

73 de Hal W8MCH

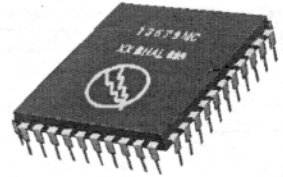


The 32 Bit Parade

A look at systems that have generated all the clamor

by Steve Holton, N2QCA

1113 Sunset Street • Yorktown Heights, N.Y. 10598 / Internet: slapshot@westnet.com



In these two concluding articles, we'll look at the systems that have generated all the clamor about being 32 bit. If you've been exposed to any of the Windows 95 hoopla - you mean you missed it?? - then you have heard the complete mantra of '32-bit preemptive multi-tasking systems' repeated numerous times. So many times, in fact, that you're probably certain that it's from the leading edge of technology. Well just as we have seen that usage of 32 bits and protect mode has been creeping into system for some time, we'll also find that multi-tasking has also been around for a very long time on large systems and has been in some PC systems for a while. So before we look at the individual systems, let's take a look at all this multitude of multi-whatchamacallit terms first.

Multi-tasking, Multi-threading, Multi-user, Mulligatawny??

The basic idea behind multi-tasking is putting your computer to work on more than one thing at a time. Now given that your PC has only one general purpose processor for executing programs, you might ask how is this possible? It's certainly true that the processor can only execute a single program's instruction stream at any given instant. Well the key is in the time scale you focus on. Today's microprocessors can execute millions of instructions per second. Which means that in one second it might be possible to execute several million instructions from each of several different tasks that it has to do. If, in doing this, each of those tasks - pieces of work - appear to be progressing, then the computer appears to be doing several things at once when seen on the human time scale. This is the essence of multi-tasking. Let's explore how this actually plays out some more.

Consider first a word processor. On the CPU's time scale most of its time is spent waiting for the next keystroke. The actual amount of processing time required to accept the keystroke and display it on the screen is quite small. Further, the amount of time that we type at full touch typing speed is rather minuscule. So most of the time we use a word processor the CPU is idle, simply waiting between keystrokes. So this idle time is the opportunity for the system to do some other work. Consider downloading a file via a modem. Even at 28,800 BPS that's only one character approximately every 350 microseconds, but most current machines have serial ports (UARTs) that have buffers so they need to be serviced only every few milliseconds. The amount of time to empty the buffer is much less than this. The processor only needs to get heavily involved at the end of a line or block, or to handle errors. Newer machines have even smarter serial ports with DMA which mean that there is no processor involvement during normal character transmission. This means that we ought to be able to be typing with a word processor while downloading a file at full speed with no noticeable slowdown in either task if we could find a way to juggle the processor back and forth between these two tasks. That's where a multi-tasking operating system comes in.

A multi-tasking system has to be able to do several things. It must keep track of each task in the system. One of those tasks is actually running the CPU. For all the others it must remember everything it needs to know to be able to start that task when it's turn for the CPU comes. At any given instant, only one task is actually executing instructions on the CPU. There may be one or more other tasks that are ready to use the CPU, but must wait their turn behind the currently executing tasks. Lastly there are tasks that are waiting for something to happen and can't use the CPU until that event happens. They might, for example, be waiting for the serial line buffer to fill or a disk transfer to complete before they are ready to

resume execution. The part of the operating system that does this juggling act is often called a dispatcher. It works from three lists of tasks: the one actually executing on the CPU; those that are ready to use the CPU but are waiting for the current one to give up the CPU; and those that aren't in a position to use the CPU because they're waiting for some other event.

Just how this lists of tasks is managed leads to some other important terms that differentiate system behavior - 'cooperative' Vs 'preemptive' multi-tasking. Windows uses cooperative multi-tasking, where a task keeps the CPU as long as it wants. Only when it voluntarily yields the CPU does the dispatcher start the next ready task. You only get the effects of multi-tasking if all the tasks cooperate and yield the CPU frequently so each task can appear to be making forward progress. If one task hogs the CPU or goes into a loop then all the other tasks appear to slowdown or stop until the offending task starts to cooperate again or gets killed by the user. Windows 95 also uses cooperative multi-tasking for all Windows (16-bit) applications. This was done for compatibility because, unfortunately, there are applications with less than well thought out designs that depend on the cooperative nature of Windows' multi-tasking. It's this cooperative behavior that often is the cause of some of the apparently sluggish or erratic behavior when running multiple Windows applications.

Preemptive multi-tasking on the other hand, has the operating system taking a more active role in managing which tasks get the use of the CPU. To start with there is some sense of priority among tasks. The dispatcher now gives the CPU to the highest priority task ready to run. If some event happens that makes a higher priority task ready to run, the dispatcher suspends the current task and lets the higher priority one run. Tasks that use relatively small amounts of CPU power but need to be able to get it quickly are given high priority. Tasks that use large amounts of CPU time, but are not directly responding to time critical events can be given lower priority. Examples of high priority tasks would include a program needing to drive a serial port at full speed to download file, or responding to keystrokes or mouse actions in the current window. Lower priority tasks would be recalculating a large spread sheet or the intensive calculations of some propagation programs. With proper selection of priorities one can see how the CPU could potentially be utilized 100% of the time, yet still appear to be very responsive to user actions or external devices like communication lines. Preemptive multi-tasking is how OS/2, Windows NT, and Unix work. It also how Windows 95 manages the new 32 bit applications, but in this environment the benefits can be diluted or negated by dependence on the cooperation of old standard Windows applications that are running - certainly the predominate case for some time to come.

How are these priorities set up to make this all happen? A part of the system typically called the scheduler does this. It periodically looks at the tasks in the system to see how much CPU they are using, then checks to see whether they are associated with the current window and then adjusts the priorities to keep the system appearing responsive. The dispatcher doles out the CPU to the highest priority task on the list maintained by the dispatcher but pre-empts it if events make a higher priority task ready. The dispatcher also limits the time a task can use the CPU before giving it to someone else. This is called timeslicing and each task is given a slice of time typically in the 10-200 millisecond range. Thus even if a high priority task starts using larger amounts of CPU, the dispatcher will keep it from hogging the CPU. The task will be forced to give it up

at the end of its slice if it hadn't already voluntarily yielded the CPU. The scheduler also looks at this and adjusts the priorities when it sees a task becoming CPU bound.

You may have also heard the term multi-threading. To you the user there's nothing visibly different than multi-tasking. The machine appears to be doing multiple things at once. The difference, at least in the common usage of the terms, is on the inside at the programming level. Multi-tasking is the broader term and usually considers the several tasks running to each be a separate program. Multithreading, on the other hand, implies that a single copy of a program is in fact creating several independent threads of execution that appear to the operating system as separate tasks. This requires considerably more skill to accomplish, particularly in the design Vs the actual coding of the program. But to repeat, there is no visible difference to the user.

The PC as it's very name implies is targeted to a single user, and DOS, Windows and Windows 95 gave no thought to the issues brought about by having multiple individuals using a system. We have seen how the protect mode of the Intel processors can enable an operating system to run multiple applications and isolate/protect them from itself and each other. This capability is necessary for any effective multi-user system, but it is not sufficient. 'Files' are the key area that has to be protected in a multi-user environment. Each user needs to be able to have files that only he can access. Similarly, the system's own files need to be protected from users. To do this users need to be identifiable, which leads to logons. Unix was a completely multi-user system from its original inception. Windows NT and also OS/2 (when it's running LAN Server or TCP/IP) have limited multi-user capabilities, like limiting file access by user. Neither, however, offers its GUI interface to multiple or remote users. Thus, while Windows NT and OS/2 have the multi-user features needed to be able to use them effectively as multi-user servers, they aren't the complete multi-user system that Unix is.

Sounds a lot like rocket science or leading edge computer science? Well, in actual fact it's pretty old stuff. All of these concepts have been routinely found on larger systems since the '60s. This stuff, in the heart of the operating system, is not where the computer revolution has been taking place. This is just the PC world catching up. The revolution is in the unbelievable price/performance advances in both computers and communications which enabled computing to move into the home and individual office as well as the very easy to use (that's a relative statement) software that's available for PCs. Let's now examine the principal 32 bit systems available for IBM PCs. I'll look at them in the order in which they were readily available on the market. We'll look at Unix last as it's sort of a special case.

OS/2 Warp

The original release of OS/2 was in 1987. It has always offered protect mode with preemptive multi-tasking. It was originally a purely 16 bit protect mode systems targeted for the then predominate Intel 80286 based machines. It would also run a single DOS program as well within the constraints of the 286 processor. It gained little attention or acceptance outside the corporate market. There, however, it slowly gained acceptance as a very sturdy platform to run custom corporate applications. When IBM began releasing OS/2 version 2 it drew more attention as this was targeted for the 386 and up processors and offered 32-bit protect mode and multiple DOS machines in protected virtual 8086 boxes. The, with the addition of Windows support, it had much broader appeal. It really came to the forefront with the release of version 3 which added Warp to the name. The refinements made in Warp made it an attractive alternative to Microsoft Windows especially with the multi-year delay in the appearance of Windows 95.

You might be surprised to learn that not all of OS/2 runs as 32 bit. There is a fair amount of 16-bit code to support 16 bit applications like DOS and Windows. This really isn't a great surprise. Beyond that there are still parts of the system that are 16 bit, but they are 16 bit protect mode - that's the key. The robustness comes from utiliz-

ing protect mode not from being 32 Vs 16 bit. For non-performance critical parts of the system being 16 bit isn't a real problem and because 16 bit code is often smaller than 32 bit code it may be a short term advantage. This is even more apparent in Windows 95 where there's an even larger residue of 16 bit code. It is also interesting to note that the way Warp manages Windows applications affords better protection than when the same application runs under Windows. The same is also true for DOS. It's from this that the "better DOS than DOS, better Windows than Windows" advertising slogan is justly derived.

When Warp is running in a pure Warp environment it is a extremely robust platform that can run for months without a re-boot. It has a full TCP/IP implementation (built-in in Warp Connect) and LAN Server. These enable Warp to have those multi-user facilities needed to perform as a powerful server, and the system has been very successful in this area.

Windows NT

Windows NT was designed from the beginning as a 32 bit preemptive multi-tasking system. In fact the system was a completely new design not derived from Windows or DOS. This, by the way, is also true of OS/2. The original NT team came to Microsoft from DEC along with Dave Cutler, the father of NT and of DEC VMS. This was a pure 32 bit system that was also portable running originally on MIPs as well as Intel based machines and now extended to PowerPC and DEC Alphas. Running DOS and 16 bit Windows applications was a secondary objective and if there was a compromise between compatibility or performance and protection - protection always won. This is not the case in Windows 95 where the exact opposite is true, while OS/2 is somewhere in the middle. Thus fewer DOS and Windows programs run on NT when compared to Warp of Windows 95 and they often run much slower as well because of the emphasis on protection. The resources required for a basic system in terms of processor power and memory were also significantly larger than for any of the other systems. This along with the compatibility factors basically kept NT off of the desktop systems. It has, however, been gradually gaining an increasing acceptance as a server.

Windows 95

Windows 95 is definitely a single user desktop system with no pretensions regarding multi-user or server systems - that's NT territory in Microsoft's view of the universe. It is also very much an evolutionary hybrid system. Carefully worded claims to the contrary - there certainly is a DOS in there - it's just that it's built in rather than separately purchased and installed as it was in Windows. To be fair, the DOS that's in there is used less than in Windows, but is used never the less. There's also a great deal of 16 bit code in the system: some because it's needed to support current 16 bit applications; some because it's smaller and any hope of coming close to meeting the target memory size for Windows 95 required that a lot of code remain 16 bits; and some because it's infrequently used and not worth migrating to 32 bits. Some major parts are now 32 bit like the file system, but in fact Windows for Workgroups had the 32 bit file system and Windows 3.1 had 32 bit file access.

In contrast to Windows NT, if a compromise had to be made between protection or other enhancements and backwards compatibility with current (and very old as well) applications - compatibility won. All the old applications run with cooperative multi-tasking. Further, the level of protection for old applications is basically identical to Windows 3.1. New pure Windows 95 32 bit applications enjoy better protection from each other and are preemptively multitasked. What this means is that when you initially run Windows 95 it'll probably behave about the same as Windows 3.1 in terms of stability and responsiveness. This is because you're running predominately if not all old 16 bit applications, and these are in many but not all ways effectively running as they did in Windows 3.1. As the proportion of new 32 bit Windows 95 applications rise then more of the claimed benefits will actually arrive.

Unix

Unix predates any of the systems we have been discussing. It was a multi-user system from its inception, complete with preemptive multi-tasking. It's extremely portable and exists on most every computer platform ever built. Lastly it's naturally 32 bit, though being portable by design, Unix has appeared on many non 32-bit platforms. Forms of Unix appeared on 386 IBM PC's before any other systems. There were even 16 bit Unix systems as well - ugh! Until recently, however, Unix on a PC has been limited to the office and even there had a very limited and niche oriented presence. Unix on the home PC was strictly for the die hard Unix hacker. This has changed somewhat recently, particularly with the arrival of Linux. Linux is free and specifically targeted for PCs. The complete source and documentation are freely available on the Internet. It is also available on CD ROM's (often included in a book) that contain a ready to run version with documentation including a large number of standard UNIX add-ons. The complete source and tools to build and modify the system are usually included. When packaged in a book, the book includes hard copy of the basic documentation and specific instructions for installation and tailoring of the version contained on it's CD ROM.

There's good news and bad news. The good news it's a very complete and well documented implementation of Unix without any AT&T or other licensing or royalties. The bad news is- it's Unix. Unix is not for the faint of heart! It does not present the ease of use or intuitive interfaces that your probably used to. To my mind Unix has always suffered from the notion that if it were all self-evident and completely documented it would be no fun! Where's your spirit of adventure! It's a puzzle, it's up to you find the missing pieces! Having said that, I use it every day and it has an incredible set of tools for programmers and for communications

and the 'net, but it also suffers from a very serious lack of applications targeted to "home use" applications, including ham radio. Being in some ways the truest 32 bit system on the PC, it's reported to out perform all others when running similar applications.

Conclusion

This concludes a five part series exploring the world of operating systems on the IBM PC from the dark ages to the present. I hope you've gained some insight to all the terminology that's being bandied about these days. It should also be clear that the IBM PC and Intel based processors have evolved from a rather primitive beginning to some very powerful systems today. Because it has been an evolutionary series of developments, none of which would ever "break" any existing application, many compromises had to be made to maintain compatibility. Clearly there's no free lunch. You want a truly bulletproof system on a PC - you can have Unix or NT with limited or no compatibility with DOS/Windows or you can run Warp with out any DOS or Windows programs. Want a little less protection but better DOS/Windows compatibility - you can have Warp with it's DOS/Windows compatibility. Want maximum compatibility with giving up more protection then how about Windows 95. Which leads to the final possibility - you don't desperately need the protection of the robust systems or don't have a whole set of new 32 bit Windows 95 applications just yet - then maybe it's just possible that the place for you is right where you are now. It's hard to tell just how this will all play out. Clearly Windows 95 has yet to take the world by storm - in many ways it's underwhelmed a lot of people. It may all be moot, though, if the vast majority of PCs that ship from now on come with Windows 95 preloaded.

73 de Steve N2QCA

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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



My travels in the digital world of Amateur Radio have often been triggered by small discoveries that led to great satisfaction.

When I first acquired a modern HF transceiver, one of my first purchases was a Kantronics KAM multi-mode controller. I originally bought the KAM for its dual port packet capability, but quickly tired of HF packet, and used it solely on VHF. One day, a friend on the PacketCluster, N4SR, asked me if I had ever tried RTTY.

I used to work as a disc jockey in a Top 40 radio station and remembered the clanking AP Teletype machine quite well. I had no real idea why people would want to do that on HF, but I already had the KAM, so I figured it was worth a try. After a few contacts, I found that RTTY hams are a wonderful community out to help newcomers. The challenge of working RTTY DX was very addictive, fueled by contacts with the major expeditions of the early 1990's.

I quickly progressed from using the KAM to a HAL PCI-3000 RTTY/Amtor/CW PC card, and started appreciating the difference that technology could make on an established mode like RTTY. Soon, I was discovering how much fun WF1B had made RTTY contesting, and spent a part of every available night looking for DX on HF.

When HAL announced the PCI-4000 card with Clover, I was very impressed. Seeing the demonstrations of the hardware as well as the Clover modulation system at Dayton each year tempted me, but the price of the ticket to explore it was too great. After all, I could already chase DX with RTTY and rag chew with Pactor and Amtor. Clover was technically very impressive, but the price was too high.

Early this year I started hearing rumblings in the RTTY world of a new DSP card from HAL that would have better RTTY performance than the PCI-3000. When people I respected confirmed that its RTTY performance exceeded the PCI-3000, and I saw the price of the card, I took the plunge. The card was priced around the same level of most high-performance multi-modes, fit inside of my computer and did not require a COM port.

Many people have already written reviews of the P38 card, comparing it from everything ranging from KAM/PK232 up to a Cray supercomputer. After using it as part of the OT5T contest effort in the 1995 CQWW RTTY contest, I can say it handles weak signal RTTY superbly and is a fine addition to the HAL product line.

Like my experimentation with the KAM many years ago, I was curious to try Clover just to see how it worked. I had the GTOR PROMs for the KAM, and never found enough people on the bands to judge its performance or value. I suspected that Clover would be the same way, as I never was aware of its presence on the air.

Reading the documentation that comes with the P38 software from HAL can be a bit daunting. The descriptions on how to select the modes, tune the incoming signal, call CQ, etc. made me a bit uncomfortable with spending a great deal of time looking for the rare Clover contact. I figured one good weekend of experimentation would be enough investment, and I could get back to my true love, "Steam RTTY"!

The first challenge for a first-time Clover contact is finding someone to link. One of the nice things about Pactor/Amtor is that you can always hear when stations are using FEC, and can see who it is before looking further down the band.

I had attended many demonstrations of Clover at Dayton, but could not remember how it sounded, so I was not sure I would know a

Clover station if I heard one. I knew that Amtor/Pactor stations were usually around 14070-14080, so a very quick scan can give you those possibilities. Where in the world do you hear Clover stations, and how do you know they are calling CQ?

After a frustrating hour of tuning 14070 through 14080 very slowly as recommended by HAL, I was about to give up. I knew sometimes during RTTY contests that stations are down to 14060, so I started to tune there.

All of a sudden, a loud strange signal appears and I see text starting to appear on the screen. I finally found a Clover signal! I was listening to the sound of the modulation, trying to memorize it for future reference when the qso I was monitoring ended. I then see "DK4ZC calling CQ, Hit Ctrl-F9 to link" appear on the top of the screen so that is what I did!

It was a very lucky contact. Fred, DK4ZC, is one of the best digital operators in the world, and he enjoys being the first Clover contact for hams more than anyone I have ever met. He spent 45 minutes with me, telling me where most stations listen, who was active and when they were on the air, etc. Finally, he asked me if I had used Express software before. Having never heard of it, he told me I could order it from IDRA. I had vaguely heard of ADRS and knew they had recently changed their name. Fred gave me their fax number and I ordered Express and membership in IDRA that day.

Now that I knew what the modulation sounded like and where to look, I would spend a few minutes each day looking for more Clover stations. Almost every day I heard new countries and was surprised how many stations were on the air. I was also surprised how devoted to Clover that they all were.

In a couple of weeks, the floppy disks for Express came.

I am not very demanding of software packages for digital modes, as most have more features and complexity than I care to master. I like things to be simple, with some power in the buffers/macros capability.

Once I got Express running, I was very impressed with how intuitive it was to use. I was not using many features of it, but it was the easiest program to perform the essential actions that I had seen. Calling CQ, linking to stations, ending links, etc were one button or a hotkey away.

Once again, the first contact I made with Express on Clover was DK4ZC. While we were chatting, he sent me a file that had his picture. I could not tell much difference in the throughput of our chat while this 2 KB file was zipped to me. Fred led me through the steps to open the file and see his smiling picture. This was amazing!

The next time I connected to DK4ZC, his picture automatically appeared on the screen! Its like a video conference where people are moving verryyyy sloowly!

When I started seeing that Express includes a built-in mailbox system, file transfer and graphic file capability, plus an interactive sketch facility I was really amazed! You can utilize all of these features on HF with impressive speed and recovery in poor conditions.

Why isn't everybody doing this? Why don't people shout out how great this is? Why aren't Clover DX stations spotted on PacketCluster? Why do I never see anything about Clover on the Internet mail systems?

(Cont'd on page 31)



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<input type="checkbox"/> 9G	Ghana	<input type="checkbox"/> GU,GP	Guernsey	<input type="checkbox"/> S2	Bangladesh	<input type="checkbox"/> XX9	Macao
<input type="checkbox"/> 9H	Malta	<input type="checkbox"/> GW,GC	Wales	<input type="checkbox"/> S5,YU3	Slovenia	<input type="checkbox"/> XY-XZ	Myanmar (Burma)
<input type="checkbox"/> 9I-9J	Zambia	<input type="checkbox"/> H4	Solomon Islands	<input type="checkbox"/> S7	Seychelles	<input type="checkbox"/> YA	Afghanistan
<input type="checkbox"/> 9K	Kuwait	<input type="checkbox"/> HA,HG	Hungary	<input type="checkbox"/> S9	Sao Tome & Principe	<input type="checkbox"/> YB-YH	Indonesia
<input type="checkbox"/> 9L	Sierra Leone	<input type="checkbox"/> HB	Switzerland	<input type="checkbox"/> S0	Western Sahara	<input type="checkbox"/> YI	Iraq
<input type="checkbox"/> 9M2,4	West Malaysia	<input type="checkbox"/> HB0	Liechtenstein	<input type="checkbox"/> SA-SM	Sweden	<input type="checkbox"/> YJ	Vanuatu (New Hebrides)
<input type="checkbox"/> 9M6,8	East Malaysia	<input type="checkbox"/> HC-HD	Ecuador	<input type="checkbox"/> SN-SR	Poland	<input type="checkbox"/> YK	Syria
<input type="checkbox"/> 9N	Nepal	<input type="checkbox"/> HC8	Galapagos Island	<input type="checkbox"/> ST	Sudan	<input type="checkbox"/> YL,UQ	Latvia
<input type="checkbox"/> 9Q-9T	Zaire	<input type="checkbox"/> HI	Dominican Republic	<input type="checkbox"/> ST0	Southern Sudan	<input type="checkbox"/> YN	Nicaragua
<input type="checkbox"/> 9U	Burundi	<input type="checkbox"/> HJ-HK	Colombia	<input type="checkbox"/> SU	Egypt	<input type="checkbox"/> YO-YR	Romania
<input type="checkbox"/> 9V	Singapore	<input type="checkbox"/> HK0/a	San Andres & Providencia	<input type="checkbox"/> SV-SZ	Greece	<input type="checkbox"/> YS	El Salvador
<input type="checkbox"/> 9X	Rwanda	<input type="checkbox"/> HK0/m	Malpelo Island	<input type="checkbox"/> SV/A	Mount Athos	<input type="checkbox"/> YT-YU	Yugoslavia
<input type="checkbox"/> 9Y-9Z	Trinidad & Tobago	<input type="checkbox"/> HL	South Korea	<input type="checkbox"/> SV5	Dodecanese (Rhodes)	<input type="checkbox"/> YV-YY	Venezuela
<input type="checkbox"/> A2	Botswana	<input type="checkbox"/> HO-HP	Panama	<input type="checkbox"/> SV9	Crete	<input type="checkbox"/> YV0	Aves Island
<input type="checkbox"/> A3	Tonga	<input type="checkbox"/> HQ-HR	Honduras	<input type="checkbox"/> T2	Tuvalu	<input type="checkbox"/> Z2	Zimbabwe
<input type="checkbox"/> A4	Oman	<input type="checkbox"/> HS	Thailand	<input type="checkbox"/> T31	Kiribati, Central	<input type="checkbox"/> Z3,4N5	Macedonia
<input type="checkbox"/> A5	Bhutan	<input type="checkbox"/> HV	Vatican City	<input type="checkbox"/> T32	Kiribati, Eastern	<input type="checkbox"/> ZA	Albania
<input type="checkbox"/> A6	United Arab Emirates	<input type="checkbox"/> HZ	Saudi Arabia	<input type="checkbox"/> T33	Banaba (Ocean) Island	<input type="checkbox"/> ZB2	Gibraltar
<input type="checkbox"/> A7	Qatar	<input type="checkbox"/> I	Italy	<input type="checkbox"/> T30	Kiribati, Western	<input type="checkbox"/> ZC4	British Sovereign Bases
<input type="checkbox"/> A9	Bahrain	<input type="checkbox"/> IS0	Sardinia	<input type="checkbox"/> T5	Somalia	<input type="checkbox"/> ZD7	on Cyprus
<input type="checkbox"/> AP-AS	Pakistan	<input type="checkbox"/> J2	Djibouti	<input type="checkbox"/> T7	San Marino	<input type="checkbox"/> ZD8	St Helena
<input type="checkbox"/> BV	Taiwan	<input type="checkbox"/> J3	Grenada	<input type="checkbox"/> T9,4N4	Bosnia-Herzegovina	<input type="checkbox"/> ZD9	Ascension Island
<input type="checkbox"/> BY,BT	China	<input type="checkbox"/> J5	Guinea-Bissau	<input type="checkbox"/> TA-TC	Turkey	<input type="checkbox"/> ZF	Tristan de Cunha & Gough Islands
<input type="checkbox"/> C2	Nauru	<input type="checkbox"/> J6	St Lucia	<input type="checkbox"/> TF	Iceland	<input type="checkbox"/> ZK1/n	Cayman Islands
<input type="checkbox"/> C3	Andorra	<input type="checkbox"/> J7	Dominica	<input type="checkbox"/> TG,TD	Guatemala	<input type="checkbox"/> ZK1/s	Cook Islands, North
<input type="checkbox"/> C5	The Gambia	<input type="checkbox"/> J8	St Vincent	<input type="checkbox"/> TI,TE	Costa Rica	<input type="checkbox"/> ZK2	Cook Islands, South
<input type="checkbox"/> C6	Bahamas	<input type="checkbox"/> JA-JS	Japan	<input type="checkbox"/> T9	Cameroon	<input type="checkbox"/> ZK3	Niue
<input type="checkbox"/> C8-C9	Mozambique	<input type="checkbox"/> JD1/m	Minami Torishima	<input type="checkbox"/> TJ	Corsica	<input type="checkbox"/> ZK3	Tokelau Islands
<input type="checkbox"/> CA-CE	Chile	<input type="checkbox"/> JD1/o	Ogasawara	<input type="checkbox"/> TK	Central Africa	<input type="checkbox"/> ZL-ZM	New Zealand
<input type="checkbox"/> CE0A	Easter Island	<input type="checkbox"/> JT-JV	Mongolia	<input type="checkbox"/> TL	Congo	<input type="checkbox"/> ZL7	Chatham Island
<input type="checkbox"/> CE0X	San Felix & San Ambrosio	<input type="checkbox"/> JW	Jan Mayen	<input type="checkbox"/> TN	Gabon	<input type="checkbox"/> ZL8	Kermadec Island
<input type="checkbox"/> CE0Z	Juan Fernandez Island	<input type="checkbox"/> JX	Jordan	<input type="checkbox"/> TR	Chad	<input type="checkbox"/> ZL9	Auckland and Campbell
<input type="checkbox"/> CM,CO	Cuba	<input type="checkbox"/> JY	United States	<input type="checkbox"/> TT	Ivory Coast	<input type="checkbox"/> ZP	Paraguay
<input type="checkbox"/> CN	Morocco	<input type="checkbox"/> K,N,W,A		<input type="checkbox"/> TU		<input type="checkbox"/> ZR-ZU	South Africa
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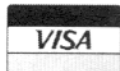
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The Last Word

from the Editor

Jim Mortensen, N2HOS • PO Box 328 • Indian Rocks Beach, FL 34635
CompuServe ID: 71573,1077



We begin by extending our deepest sympathy to Jules W2JGR as he mourns the passing of his wife. The care and attention he gave her during the years of her declining health is an example for us all. Sad that one who gives so much must suffer such a grievous loss. Our heart goes out to him.

Don AA5AU kindly agreed to fill in for Jules during this period. We deeply appreciate his efforts.

We welcome Neal Campbell ON9CNC to the Digital Journal staff this month. His first article appears this month and is the beginning of a series on the subject of Clover in Europe. By no means will he be limited in his scope for we are anxious to hear a good deal about his sojourn through the endless variety of our hobby, regardless of mode. I think you will enjoy every bit of it.

Asked a bit about himself, Neal responded with the following: "I am living with my wife and four English Springer Spaniel dogs in Belgium where I work for an international telecommunications company. We moved to Belgium from the United States in May 1995. I then switched calls from AB4MJ to ON9CNC. After the usual pursuit of DX on SSB and a bit of CW, I was introduced to RTTY by N4SR and K4FJ in 1991. It's been all digital ever since.

With the purchase of a HAL P38 card in July 1995, I was soon immersed within the world of Clover. My first Clover contact was with Fred, DK4ZC who has mentored many hams in this new mode. Clover's speed, sophistication and flexibility convinced me of its high performance on HF bands for all four modes. I can now be found searching for RTTY DX or Clover contacts from 1800-2000 GMT on 20 meters.

I am also actively involved on the Clover E-mail reflector on the Internet. To subscribe, send a message to <Majordomo@iea.com> with "subscribe adrs-digital" in the text of the message. The Clover reflector is dedicated to exploring the tools, technology and tricks of Clover and other advanced digital modes. You can contact me directly at <Neal.Campbell@ping.be>.

We also welcome Jim Floyd WA4ZXA to our growing flock of serious volunteers. Jim (if you have sharp eyes, you noticed that he collected the CQWW high-claimed scores published last month) is an avid tester. But he is also believes that a volunteer organization like ours needs help in all areas. So he has taken on a tough one, the management of our new 'Disk Library.' You can read more about it further down the page but for now, let's talk about Jim. He is our second retired fire fighter (though the last 3 years were in the communication division), and lives in Thomasville, NC with his wife Katherine. They have one 21 year-old son Terrence. While Jim has done DXCC, WAC and so forth in SSB and CW, his real interest is contesting. And, since he just started RTTY contesting, I would alert everybody out there that you have a new competitor on the block.

Jim has been licensed since 1976, is a Vietnam Marine veteran and is the Commander of the local chapter of the DAV, 'has

always been into ham radio . . . and love contesting as much as DXing. I always run LP because I do not have an antenna farm to compete with the big guns. I am planning on putting another tower up, and when I do I will go HP.

My wish is to go on a Dxpediton to a rare location, somewhere in the South Pacific or something. I love to run stations and really get bored if I have to search and pounce, so the pileups would be just right for me! Good luck and thanks, Jim.

The Disk Library is not going to be your ordinary shareware counter. This is designed principally for those who can't or do not wish to go through the hazards of downloading files from the Internet or other on-line sources. Some of the disk volumes will be devoted to upgrades to IDRA Software Store products. Hopefully, we will also be able to develop a few demo disks for these products as well. Each of these disks will be available as soon as the upgrades are received by IDRA. Charges will be limited to materials and postage in this category.

The second group in the library will be those 'standard' operating packages like Winlink, various packet products, different terminal programs, etc. The third category will be built around selected share or freeware discovered or written by members of the Digital Journal staff or others who submit the product to us. A service charge will be added to the material and postage costs in this category.

The final section (at least at this writing) is a section called 'booklets on disk.' This might entail everything from something like our COMPORT booklet to complete issues of the Digital Journal. Each disk will be in both ASCII and .WRI format so the buyer can read and/or print the contents regardless of the operating system. Graphics will probably be in .BMP format. Prices in this unit will vary considerably from one volume to another and depend entirely on the contents.

More details will be found in the January issue, including an order form. In the meantime, if there is any software product you have on your machine that you think is worth publishing in disk form, please send me a note right away. And, by the same token, if you have any special requests for products on disk, send a note as well. Once again, we thank Jim for taking on this project. We do need an additional pair of hands . . . for work that can be done anytime of the day or night. All it takes is reasonable computer expertise and a certain amount of willingness and patience. If you are interested in preparing text and graphic material for the distribution disks, please let me know. It would be most appreciated.

It's time for a brief Win95 update. I have now been running the new OS since May and am now convinced it is the real thing. My installations run better than 3.11 ever thought it might! If you have the hardware it requires, go for it. There is no point in waiting. If you already have it, here are a few notes from the trenches. A strong YES to Norton Utilities and Virus, but an equally strong NO to Norton Navigator. Don't waste your money. The Space Wizard is one of Norton's fine utilities and one that is particularly helpful if you load Win95 over your old Windows directory. While it is not readily apparent, there is a huge number of surplus files, both duplicate and unused (including almost all of your old DOS directory). It will help

locate them. But, remember to take the 'backup' option so, once erased, you have time to find out that you do indeed need both copies of that .DLL file! Proceed with caution. One thing I am not fond of is the subdirectory Norton sets up in the Recycled directory. If you delete all the files in the Recycled directory, you will find out that they still aren't removed from your hard disk. They collect in the subdirectory, so delete them again! Amazing how much trash you can build up between the two of them.

Quarterdeck's Cleansweep does a better job of identifying duplicate and old, unused files. This very inexpensive product sweeps the directory of your choice and comes up with some awesome options. But, once again, proceed with care until you know for sure the dupes are not needed. And be extremely careful in handling any file with a .SYS or .BAK suffix. The .BAK files are quite frequently absolutely necessary for the operation of Win95, and are NOT automatic candidates for deletion.

Three pieces of shareware are worth special mention. They are all by Canyon software in San Rafael, CA at 415 453 9779. Drag And Zip, Drag And File and Drag And View are, quite obviously all of a family and, once installed, operate as one 32 bit package. Canyon has surpassed the Explore File Manager and provides a complete and very satisfactory system. It does all that Explorer does and much more. For example, select any file in Drag And File's window, click the right mouse button and you can view the contents of virtually any kind of file extant, whether zipped, a graphic, or what have you. This makes the whole thing worth millions, but the prices are much more reasonable than that! Try it. The Drag'n files are available for downloading all over the lot.

Finally, a word about the Internet. Unless you use Microsoft's network and software under Win 95, getting on the Internet required the tedious building of a TCP/IP stack to get into your SLP connection, then launching a 32 bit browser. Complicated! Netcom (advertised everywhere) is as simple to install and register as any program I have every seen. My only problem was a silly bug in their registration software. In the credit card box, I checked Master Card, but when it came time to send the data, the checkmark moved to the Visa box! I went through that three times before finally registering by voice. No big deal. Then I launched the NetCruiser (V2.0) software. Worked right out of the box and worked almost as well as NetScape. In some ways, it is as good or even better. And since NetCom is basically a provider to commercial network users, the quality of their network and local servers is first rate. I recommend it.

I'm networked, now. Even since Paul W4ZB did the series on networking, I have wanted very much to network all three of my computers. There has been one little roadblock, however. I use nothing but notebook computers around here so, with one exception (the Toshiba T6600 which contains the HAL P38) I have no slots available. Nor can I afford to give up PCMCIA slots for Ethernet cards. Then, along came a catalog that (like dozens of others each week) almost went straight to the big file in the garage. A small ad caught my eye. I read through it twice and ordered one of the products that very day. And it works perfectly! The installation is as simple as pie—parallel ports are used throughout the network—and it is quite true that in 15 minutes you can be networked.

There are two models available from Leunig Communications Inc., San Jose, CA, phone 408 441 6856. The small unit handles two computers and one printer. The 'NET 44' handles four computers and two printers. I bought the 'NET 44' (the price, \$199.95 from Tiger Software) because it is the only one that can operate under Win95. So, now each computer has complete access to all of the files on all of the drives of the other computers on the network as well as the two printers. The network is very high speed and bears no relationship to the serial

port file transfer speeds. By the way, printer cables up to 60 feet long may be used. Just make certain that all of the cables you use have all 25 wires 'straight through.' Many cheap cables don't. The little box is unobtrusive, never complains and handles all of its chores better than implied in the ad. I am very pleased with the result.

Good signs in November! My new rig arrived one day before the CQWW SSB contest. I hadn't really wanted a new rig, but, as they say, once you get lightning in the system you never get it out. The old one acted up the day I was tuning up for the JARTS shindig and I decided to pull its plug. Anyway, there was little or no digital activity around and 20 meters was reserved for those stations with 5 or more kilowatts, so late Saturday I switched to 15 meters. And there was the entire Pacific! I ran a string of JA's, ZL's, V73, FO5, KH6 and KH8 and so on, including virtually all of South America. It seemed like 1990! My booming 100 watts worked every station with a readable signal. Once that was accomplished, the band conveniently folded until next time. We can only conclude that there is hope. Despite the deplorable numbers, I can now look every now and then at my favorite band and hear a real, honest-to-john signal. Try it! The worm has turned just a tiny bit.

Finally, do yourself a favor and look at the special holiday gift membership offer. The details are elsewhere in the Digital Journal, but it's very simple; for each present you give you get something in return. So, go ahead, take advantage of the IDRA! We can make very good use of your check or credit card number!

Presidential Quote— one recent night, after Paul W4ZB's car was almost totaled by a deer in the wilds of rural Virginia (the damage to the car was a mere \$10K!), the police arrived on the scene. Their first question was "Anyone hurt?" No, fortunately. Then came the second question, "Don't you want the deer?" "What for," replied Paul. In response the friendly police officer said, "Makes for good eating and the deer season hasn't started yet." To which, Paul replied, "Nope, I've lost my taste for venison tonight!"

Special thanks again to Don AA5AU for pinch-hitting this month. And Holiday Greetings to every reader everywhere. May 1996 be the greatest year yet!

73 Jim N2HOS Editor

(Cont'd from page 26)

I figured that all someone needed was a small nudge in the right direction. My friends have led me to small discoveries that have provided great satisfaction. Why can't I help some of my friends in the same way? If someone had really shown me the power of how you can use this technology, I would have been active on Clover two years ago. Its one thing to have sophisticated modulation techniques, its another thing to use it to advantage.

I will be exploring some of the exciting things that I have discovered using Clover. I hope that you will be nudged to explore some of them, and tell others about them. Clover is growing every day. More and more countries are represented and the software programs are getting better each month.

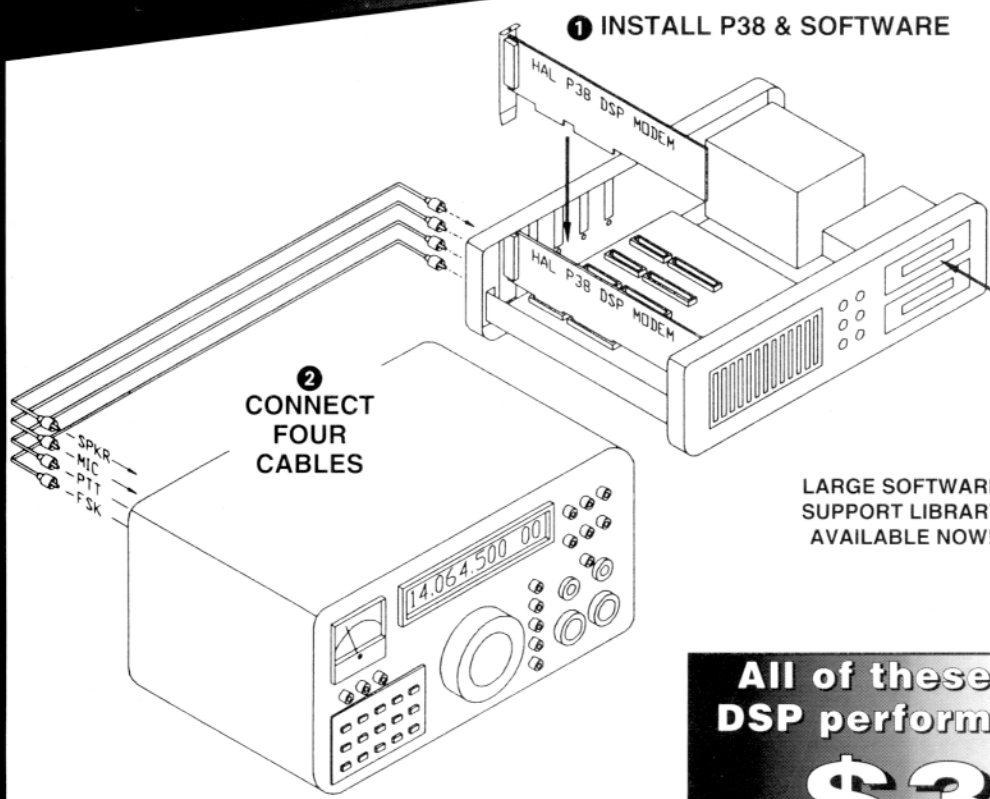
Isn't it time to give it a try? Listen around 14066, LSB (plus or minus 1 Khz). There is a lot happening there that you were not aware of!

If you hear me on Clover, please link up with me. If you have Internet access, join our Clover Reflector. If you work some exciting DX on Clover, let me know, because we are all interested in working new countries.

Until next time 73, Neal

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