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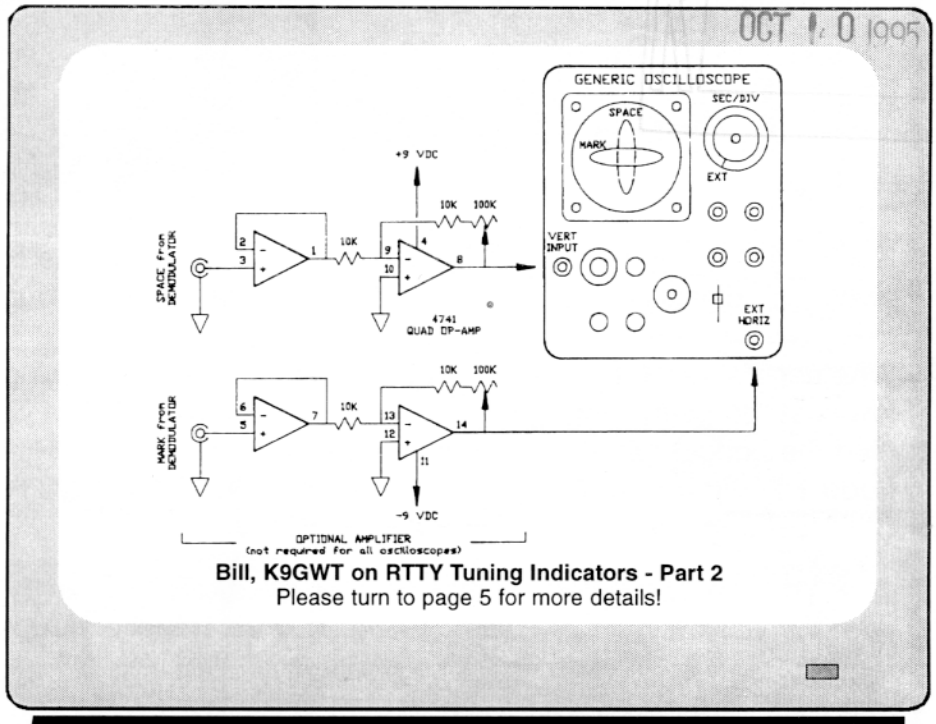

Bill, K9GWT on RTTY Tuning Indicators - Part 2

Please turn to page 5 for more details!

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Tough Band Conditions Demand The Best HF Modem:

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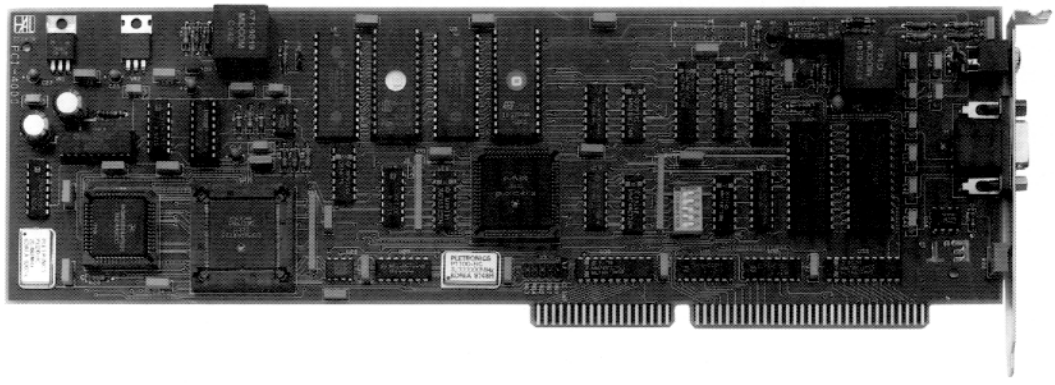

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The principal goal of the IDRA is to advance digital technology as it applies to amateur radio and promote the wisest use of the digital portion of the spectrum. Being a member makes you a partner in advancing these digital goals. IDRA is a not-for-profit corporation and contributions to the Society are deductible for income tax purposes to the extent allowable under the tax laws of the United States.

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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

An important annual event for all interested in the more technical aspects of digital communications by radio, the 14th ARRL Digital Communications Conference, sponsored this year jointly by the ARRL, TAPR and Texas Packet Radio Society ("TPRS"), occurred over the weekend of September 9-10th in Arlington, Texas. Dave Wolf, WO5H, Digital Journal columnist, was actively involved through TPRS and with TAPR in putting on that event. I had been planning to attend but had to cancel at the last moment due to unexpected business demands.

For those who were not able to attend, the conference proceedings may be ordered through TAPR. Last year TAPR took over from ARRL the reprinting of the conference proceedings for all prior conferences back to 1981, making the out-of-print back references readily available again. More recently, TAPR has implemented a text search facility for the abstracts of those prior conferences at its WWW site, making it now very easy to "find" particular technical information from those proceedings. The IDRA Web pages contain hyperlinks to the TAPR WWW site.

The IDRA will continue to use the Digital Journal and its Internet facilities to keep its members informed and updated about the very rapidly changing technical side of the digital communications art. Although the IDRA "typical" member profile is someone who has been involved for a number of years and who is also active on the operating side of the hobby, most members also very much want to keep up with the changes in technology which are coming.

To facilitate future communications with its members, the IDRA has added a field to its membership records for E-Mail addresses. Members will be requested to provide such addresses! You may then occasionally receive E-Mail messages from the IDRA!

IDRA is also expecting shortly to implement its first Internet mailing list as a forum for information interchange among its members. Watch for announcements on the WWW site bulletin page or in the Digital Journal.

On the IDRA's technical side, Steve Holton, N2QCA, has taken over primary responsibility for maintenance, updating and expansion of the IDRA WWW site and Internet facilities. Steve whose name will be recognized by all regular readers of the Digital Journal has impeccable technical credentials and we can look forward to much greater things to come under Steve's leadership. Others who have time and talent to volunteer are still needed.

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!

73, Paul Richter W4ZB

CQ World-Wide DX Contest

ALL-TIME RTTY RECORDS

Written & compiled by Jay Townsend, WS7I

MULTI OPERATOR - MUTLI TRANSMITTER

WORLD RECORD

1992	W3LPL	3,111,748	2,233	4,556	116	326	241

CONTINENTAL RECORD

	AF No Entry						
1993 AS	JJ3YBB	586,249	684	1,873	79	187	47
1991 EU	LY2WW	927,710	916	2,285	87	236	83
1992 NA	W3LPL	3,111,748	2,233	4,556	116	326	241
1992 OC	T32RA	1,770,131	1,744	5,191	69	118	154
	SA No Entry						

MULTI-OPERATOR/SIGNLE TRANSMITTER

WORLD RECORD

1992	P40RY	3,543,090	2,222	6,635	91	220	223

CONTINENTAL RECORD

1992 AF	EG8CMR	963,116	1,048	3,127	59	120	129
1993 AS	UZ9CWA	2,580,660	1,716	4,779	120	333	87
1992 EU	UW2F	2,847,220	1,767	4,909	106	271	203
1991 NA	V2/G0AZT	1,680,607	1,577	3,743	78	180	191
1993 OC	NH6T	1,138,070	1,042	3,118	83	130	152
1992 SA	P40RY	3,543,090	2,222	6,635	91	220	223

SINGLE OPERATOR/ALL BAND

WORLD RECORD

1990	HC5J	1,364,972	1,143	3,362	89	185	132
	Op. WS7I						

CONTINENTAL

1994 OC	ZL3GQ	737,741	802	2,357	72	133	108
1990 SA	HC5J	1,364,972	1,143	3,362	89	185	132
	Op. WS7I						
1991 AF	CT3M	1,075,584	941	2,801	82	213	89
	Op. DJ6QT						
1994 AS	9K2ZZ	962,104	1,068	3,016	61	179	79
1992 EU	GU3HFN	1,223,849	1,081	3,007	80	191	136
1994 NA	HH2PK	1,304,485	1,252	3,055	76	167	184

SINGLE OPERATOR/ALL BAND ASSISTED

WORLD RECORD

1994 EU	DK3GI	1,186,185	997	2,607	83	242	130

CONTINENTS

	AF No Entry						
1993 AS	JA3YBF	221,298	384	958	65	135	31
1994 EU	DK3GI	1,186,185	997	2,607	83	242	130
1992 NA	K1IU	971,412	911	2,028	96	222	161
	OC No Entry						
	SA No Entry						

SINGLE OPERATOR/SINGLE BAND

WORLD RECORD'S

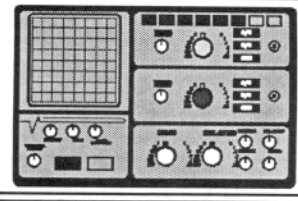
1994 3.5	9A1A	47,894	291	622	9	52	16
	Op. 9A2RA						
1994 7	DJ2BW	135,168	414	1,024	22	69	41
1993 14	VY2SS	374,550	913	2,270	27	90	48
1992 21	ZP5JCY	433,532	871	2,596	30	85	52
1992 28	ZD8LII	355,426	840	2,503	23	66	53

(Cont'd on Page 7)

Tuning Indicators for RTTY

and other digital modes -- Part 2

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



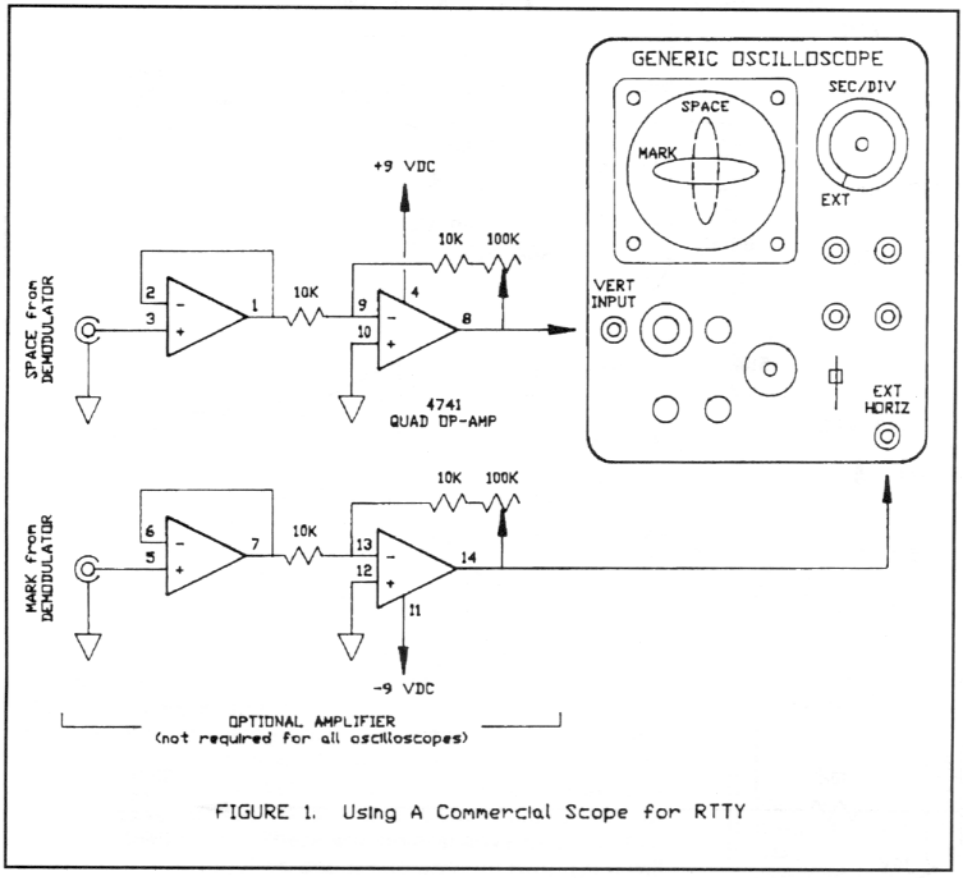


FIGURE 1. Using A Commercial Scope for RTTY

Using a Standard Commercial Oscilloscope

In Part I, I discussed several different circuits and techniques that have been used as RTTY mode tuning indicators. Each has its "pluses and minuses", but the most popular by far is the RTTY Scope indicator. There is very little practical information available in modern literature about how to make one of these gadgets. Well, I'm old enough to remember and have even built one or two of the beasts myself. I see no way that my company (HAL) could make this a cost-effective product, but I'll be glad to share the technical data.

WARNING - HIGH VOLTAGE!
Before we go any further, I must emphasize that ALL scope circuits involve a high voltage supply - a *potentially lethal* high voltage supply. So, please do the following:

1. KEEP YOUR HANDS OUT OF THE INNARDS WHEN POWER IS CONNECTED.
2. GROUND ALL HV CAPACITORS BEFORE WORKING ON THE CIRCUITRY.
3. KEEP ONE HAND IN YOUR POCKET!

USING A COMMERCIAL OSCILLOSCOPE:
While it would be nice if we could all have special tuning scopes for RTTY, the fact is that (1) there are presently no commercial RTTY Scopes manufactured, (2) there are few used RTTY scopes to be found, and (3) not all of us want to build our own scope. However, the probability of finding a pre-made scope increases considerably if we include "laboratory-quality" scopes - and - "monitor scopes" in our search.

While a "laboratory" and/or "monitor" scope may have lots of neat features, the only essential requirement for RTTY use is that the scope have a signal input for horizontal ("X") deflection as well as the more common vertical ("Y") axis input. The more complicated the scope, the more closely you'll have to inspect the front panel and/or manual. Virtually all "very old" scopes have a separate X-axis input (e.g., Dumont 208 and other 1950's monsters). Likewise, all Heathkit, Knight Kit, and Eico scopes I recall had a separate horizontal input. You may have to look very closely at some of the Tektronix and HP units. If a horizontal input is provided, it will probably be selected as the far counter-clockwise position on the sweep switch ("SEC/DEV"). When the "EXT" sweep switch position is selected, the x-axis input is usually connected to the "EXT TRIG" jack on this type of scope.

A number of the radio manufacturers - Kenwood, Yaesu, ICOM, Heathkit, etc. - have, over the years made a nice little "monitor scope". These units were usually designed to monitor the transmitter RF and modulation signals, but most can be used as a RTTY Scope as well. Some include "RTTY" input jacks and may even show connection diagrams in their instruction manuals. These units make very nice station monitors and RTTY tuning scopes. However, all of these units usually need extra amplification when used with modern RTTY modems (solid-state rather than tubes). Connection of an RTTY modem to a generic oscilloscope is shown in Figure 1. The amplifiers are optional and may not be required for use of some scopes, particularly high-end laboratory units. If required, the additional amplifiers may be mounted inside the scope - or housed in a little "mini-box".

SCOPES FOR MODEMS WITHOUT A SCOPE OUTPUT:
In some cases, the RTTY demodulator may not include separate Mark and Space connectors for a RTTY tuning scope output - DSP modems such as the PCI-4000 and

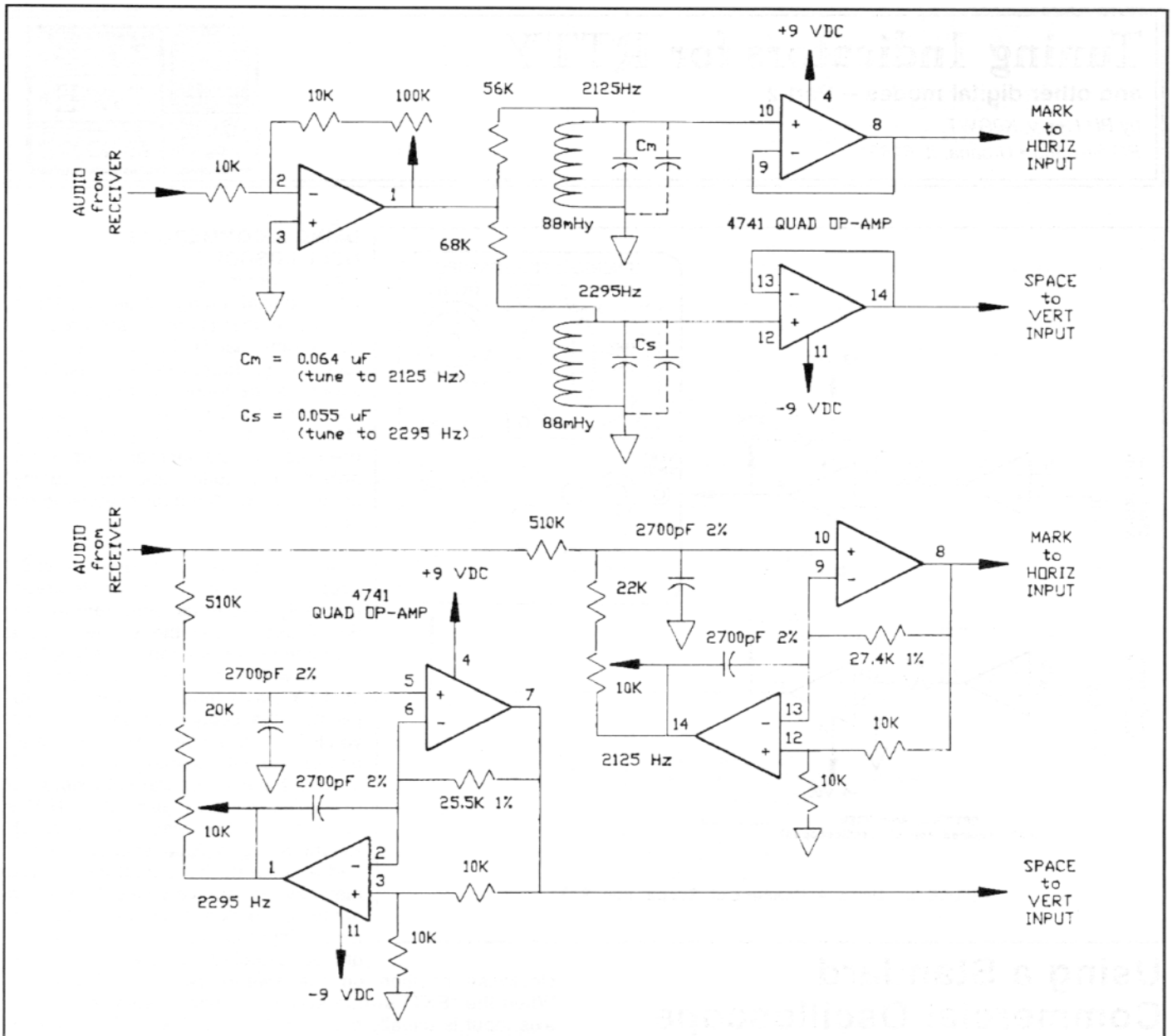


FIGURE 2. Tone Filters for RTTY Scopes

P38, for example. In other cases, the outputs are so broadband that the scope indication is misleading - the PK-232, for example. In these cases, you need to add filters to create Mark and Space signals for the scope.

Two different filter circuits are shown in Figure 2. The simplest (at the top) uses our old RTTY standby, the 88 mHy toroid. You probably have a couple of these around - or the 22 mHy or the 44 mHy - all values may be made to work. You only need to precisely tune these filters to the required Mark and Space RTTY tones - the *same* tone frequencies used by your RTTY modem. In the U.S., the standard frequencies are 2125 Hz for Mark and 2295 Hz for space. In Europe, some modems use these tones; others use "low tones" - 1275 Hz Mark and 1445 Hz Space. In addition, "TNC's set-up for HF packet radio (PK-232) may use 200 Hz shift and tones of 2110 and 2310 Hz. Find out what tone frequencies your modem uses and tune the filters to match. The active filter circuit (bottom half of Figure 2) is very easy to tune up and does not require the 88 mHy toroids - but it does need precision components - 4 2700pF, 2% polystyrene capacitors and 27.4K and 25.5K 1% precision resistors.

This idea works very well, but note that you will really be tuning the receiver to match the scope filters. There will be a tuning error if you don't match the scope filters exactly to the filters in the modem. This circuit has the advantage that you can make the scope ellipses as narrow and precise as you want by changing the bandwidth of the Mark and Space scope filters. In the toroid version, increase the value of the two 56K resistors to reduce the bandwidth. In the active filters, increase the value of the 510K resistors to decrease the bandwidth (make the ellipses more narrow). However, the sharper you make the scope filters, the more important it is that the center frequencies of the scope and modem filters match. Also, if you make the scope filters too narrow, tuning will be a lot more difficult. I personally pre-

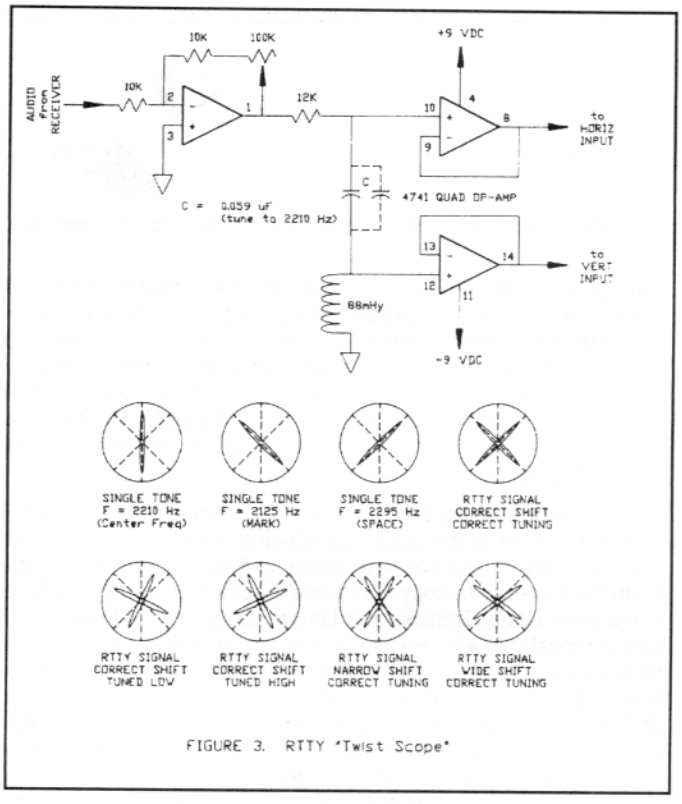


FIGURE 3. RTTY 'Twist Scope'

fer that the filters have a bandwidth of 50 to 100 Hz so that I see open ellipses and have information about which way I need to turn the knob to tune the RTTY signal.

An interesting variation of adding filters to a RTTY scope is the so-called "RTTY Twist Scope" or "Phase Shift Indicator". This scope circuit (from W0HZR and W2JTP) has been around a long time, but to my knowledge hasn't been published for at least 10 years. This circuit uses one series-resonant L-C circuit, tuned to the center frequency - the mid-point between Mark and Space (2210 Hz for 2125/2295 Hz tones). There are several advantages to this circuit: (1) it only requires one toroid and not two, (2) it will work with different shifts as long as the center frequency is the same (170 or 200 Hz shift with a 2210 Hz center frequency), and (3) it clearly shows which direction tuning should be changed. The schematic and typical tuning indications are shown in Figure 3. In this case, the amplifier stages are necessary to isolate the tuned circuit from the receiver input and prevent loading by the oscilloscope. The value of the 12K resistor may be changed to balance the length of the trace as it rotates. This is a neat circuit that can be used with any X-Y RTTY scope - commercial, or "home-brew".

This completes Part II, a discussion of how to use existing general purpose scopes as RTTY tuning indicators. Next month in Part III, we'll get into the innards of the scope itself and discuss how to make that "dream" scope you've always wanted. Also - ***coming soon*** - a new contest - a **home-brew** contest. As they said on the radio, "stay tuned for more details".

(Cont'd from Page 4)

CONTINENTS

AFRICA							
	3.5 No Entry						
1988 7	EA8AKQ	12	2	6	1	1	0
1990 14	EA8RA	104,451	315	941	25	46	40
1992 21	ZS6EZ	382,630	772	2,305	27	87	52
1992 28	ZD8LII	355,426	840	2,503	23	66	53
ASIA							
1992 3.5	JR2CFD	153	10	17	4	3	2
1994 7	JA8BZL	5,916	48	116	18	23	10
1994 14	JR5EXW	157,615	377	1,087	30	74	41
1992 21	JE2UFF	84,588	259	742	25	55	34
1990 28	JR1IJV	123,066	328	954	28	59	42
EUROPE							
1994 3.5	9A1A	47,894	291	622	9	52	16
	Op. 9A2RA						
1994 7	DJ2BW	135,168	414	1,024	22	69	41
1993 14	S51DX	293,433	700	1,869	30	77	50
1992 21	LZ1MC	247,950	623	1,653	27	70	53
1990 28	4U1ITU	236,842	547	1,499	32	79	47
NORTH AMERICA							
1993 3.5	K1IU	39,710	273	418	10	37	48
1993 7	W2UP	125,656	489	904	22	68	49
1993 14	VY2SS	374,550	913	2,270	27	90	48
1994 21	KP2N	293,562	856	2,082	23	7	51
1990 28	AB8K	96,250	312	770	29	67	29
OCEANIA							
	3.5 No Entry						
	7 No Entry						
1990 14	VK3EBP	62,964	198	583	24	48	36
1990 21	YC1YMN	116,051	344	1,027	25	50	38
1989 28	KX6OI	49,572	206	612	18	37	26
SOUTH AMERICA							
	3.5 No Entry						
1993 7	PJ2MI	65,835	243	693	18	34	43
1992 14	4M5RY	270,256	599	1,778	23	73	56
	Op. YV5KAJ						
1992 21	ZP5JCY	433,532	871	2,596	30	85	52
1991 28	ZP5JCY	235,884	599	1,787	23	57	52

These records are since the start of the contest in 1987. They include data through the 1994 CQWW RTTY contest. They have been compiled from data in the RTTY JOURNAL and the Digital Journal. Any errors or any corrections to the author WS7I. It might be noted that the time frame for the contest has changed in recent years.

73, Jay WS7I.

.... Jim here is the poem.....

THE CONTEST . . . By K4IBP

The flux was low, the mag was high,
The signals came warbled in from the sky.
The XYL, she was bossy,
The paths, they were lossy,
It's enough to make you take to drink.

But to the contest, I'm committed
I'll work all I'm permitted.
You'll see, I'll come out on top.
But the neighbor's at the door (He's been there before),
It's enough to make you take to drink.

So I thought real fast —
Made a quick change in class —
Put my neighbor to checking my dupes.
While he's not watching T.V.,
It's multi-single for me — I'll come out on top, you'll see.

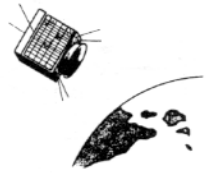
Well the contest's now history,
My score is no mystery,
The packet net has them all to see.
It's a little embarrasin'
When they start the comparison.

It's enough to make you take to drink.

Digital Satellites

How to work the EASYSATS

By David Medley KI6QE/VK2IMJ • 1020 West Oleta Drive • Tucson, AZ 85704
CIS 74072,1261 / Internet: dmedley@indirect.com



Last month we introduced the subject of Satellite Communications and specifically discussed the copying and decoding of telemetry data from the Dove Satellite. By now you are all probably tired of watching telemetry although there are some who get a great deal of enjoyment from it as most satellites transmit this kind of data. It is interesting to follow what is going on out there in space. So this month we will discuss how to actually transmit to a satellite and receive responses without going to too much trouble and expense.

Interestingly enough we are going to talk about Satellites launched by Russian space vehicles from the space station in Siberia. These Satellites are all simple devices and require the minimum of ground station equipment. For this reason they are colloquially known as "The Easy SATs". In addition to these there is the Russian Space Station MIR, which also comes up on Ham frequencies from time to time.

So let us first explain a few terms which will occur frequently in these articles. Most satellite operations are Full Duplex which means a capability of transmitting and receiving at the same time. This is usually achieved using different frequencies or even different ham bands. The transmit channel is called the Up-Link and the receive channel is called the Down-Link. The Orbit is the path the satellite takes as it circles the Earth and the parameters which describe this path are called Keplerian Elements. Last month we discussed Tracking Programs in detail and it is hoped that most readers will have one by now. These programs are essential if you really want to operate through a satellite. They show you where the satellite is at all times and tell you when you will be able to see it from your location, where to look and how long it will be visible, as well as giving you a whole lot of other data which we will talk about later. You will also be able to use them to drive a directional antenna system when you get really serious but for now we only need to know when to start listening.

Last month we talked about DOVE and how easy it is to copy. Now we will talk about MIR, the Russian space Station. The antenna you used to receive DOVE will be quite suitable for MIR because the signals are strong. On board MIR there is a typical AX-25 TNC which looks just like a Tiny2 or an MFJ terrestrial personal mailbox. You can connect to it and leave messages for the Astronauts (or anybody else for that matter) and collect the responses. MIR operates on 145.55 MHz. Be warned, however, that operating with MIR constitutes something of a challenge, the problem being interference, big time interference. Many Hams will be trying to connect at the same time but with a little patience you will succeed. Here are a few tips.

1. Try operating at off hours such as in the very late night or early morning passes when all sensible people are in bed.

2. Listen before you send out a connect request. Be sure you have the correct callsign as these vary from time to time depending on the individuals who are manning the space station . These callsigns are usually of the form UxMIR-1.

3. Use as much power as you have at your disposal especially when the frequency is crowded. In the wee small hours of the morning a few watts will probably suffice.

4. Pre-prepare any message you may want to send to the mailbox. Be considerate of the many others who may want to connect and avoid sending BBS messages via keyboard. Disconnect as soon as you are finished so somebody else may use the slot.

Having conquered MIR we must now take a further step forward and try the Russian RS (Radio Sputnik) satellites and for a while stray out of the digital world and back into the analog scene. So dust off your mikes and keys (CW of course) and brush up on your code. If you are a codeless licensee not to worry. You can have plenty of fun on phone. You might even be encouraged to learn the code because this is one area where it is still extremely useful as you will find out.

These satellites are unique in that they are carried on a much larger platform of one of the COSMOS series of satellites and therefore have more power and space available to them. Signals are usually strong and easy to copy. For these satellites we must introduce a new term, Linear Transponder. Do not confuse this with an earth-bound repeater which receives one signal at a time on a discrete frequency and repeats it on another discrete frequency. The Linear Transponder receives all signals on a given bandwidth and repeats all these signals on another bandwidth. This introduces yet another term, Mode. The Mode indicates how the Transponder is operating. For example a Transponder operating in Mode A will receive on a portion of the two meter band and retransmit what it hears on a portion of the ten meter band. Again a Transponder operating in Mode K will listen on the fifteen meter band and retransmit everything it hears onto a portion of the 10 meter band and a Mode T satellite receives on 15 meters and retransmits on the 2 meter band. These are the three modes used by the RS satellites..

The Transponder makes no distinction between emissions. If it hears SSB it will transmit SSB. If it hears CW it will transmit CW. HOWEVER, please do not use FM unless you are sure this type of emission is permitted. Most satellites will not allow FM as it is a very power hungry type of emission. Likewise Packet and RTTY should not be used on these analog satellites. There are plenty of digital satellites up there which will be covered next month so stay tuned.

Here is some pertinent information on the RS satellites. It is taken from the AMSAT pages in the World Wide Web. Those of you who are into INTERNET and WWW will find a wealth of information on satellites and their status.

RADIO SPUTNIK
RS10/11, RS12,13 and RS-15
-- Satellite Summary --

RS10/11

Name: Radio Sputnik (RS) 10/11
NASA catalog number: 18129
Launched: June 23 1987
Primary spacecraft: COSMOS 1861 - Russian Navigation Satellite
Orbit: Polar LEO (Low Earth Orbit) - 1000 km altitude
Period: 105 minutes
Modes: K, T, A, KT, KA
Beacons: 29.357 and 29.403

Features:
Linear Communications Transponders
Robot autotransponder

Linear Transponder: note Satellite RS-10 is presently active in Mode A

Mode A Uplink: 145.86 - 145.900
Mode A Downlink: 29.360 - 29.400
Robot Uplink: 145.820
Robot Downlink 29.457 or 29.403 (Beacon Frequencies

RS - 12/13

vName: Radio Sputnik (RS) 12/13
Launched: February 5, 1991
Primary Spacecraft: COSMOS 2123 - Russian Navigation Satellite
Orbit: Polar LEO (Low Earth Orbit) - 1000km altitude
Period: 105 minutes
Modes K, T, A, KT, KA
Beacons: 29.408 and 29.454

Features:

Linear Communications Transponders
Robot autotransponder

Linear Transponder: Note: Satellite RS-12 is presently in mode K.

Mode K uplink: 21.210 - 21.250
Mode K downlink: 29.410 - 29.450
Robot Uplink: 145.830 MHz
Robot Downlink: 29.408 or 29.454 MHz (Beacon Frequencies)

RS-15

Name: Radio Sputnik (RS) 15
NASA Catalog Number: 23440
Launched: December 16, 1994
Orbit: Polar LEO (Low Earth Orbit) - 2000 km altitude
Period 128 minutes
Modes A
Beacons: 29.3525 and 29.3987

Features:

Linear Communications Transponder

Linear Transponder:

Mode A uplink: 145.858 - 145.898 MHz
Mode A downlink: 29.354 - 29.394 MHz
Beacon 1: 29.3525 MHz
Beacon2: 29.3987 MHz

The nice thing about RS-10 is that you uplink on 2 meters and you downlink on 10 meters. This means that most with Technicians licenses with HF privileges already have the necessary equipment. As of this writing RS-10 and RS-15 are both in Mode A . Incidentally RS-15 has not been mentioned so far because its orbit is almost twice as high as the others of the series which makes signals weaker and harder to work. We will come back to RS-15 in a future article as it has some DX potential.

Now lets get back to working RS-10. Remember you are receiving on 10 meters so you don't have to worry about your receiving antenna pointing at the satellite. A vertical or horizontal dipole will do just fine as the signals are quite strong. As for the 2 meter transmitting antenna a good groundplane will do especially if you have 100 watts or so of RF available. The so called "gain" verticals for 2 meters should be avoided as these provide a lower angle of radiation and you will lose the satellite as it climbs higher into its orbit. Some hams I know of are working RS-10 from an apartment with antennas as described above. Of course, beam antennas with azimuth and elevation rotors will do a better job but not essential at this stage. We will discuss these antennas when we come to the microsats further down the line.

So how do we do it? We talked about full duplex so we should be able to transmit on the uplink and hear our own signal on the downlink. The problem is how to find the downlink. This brings us to yet another buzzword, Translation constant. This is the relationship between the uplink and downlink frequencies and it varies between satellites and modes. (Here comes the Math but don't be dismayed. It is simple). Given your intended uplink frequency the downlink frequency is determined by:

F down = Ft + Fup

Ft is the translation constant in MHz and it depends on the mode:
Mode A: -116.5 MHz
Mode K: +8.2 MHz
Mode T: +124.7 MHz

So if we are in mode A and have chosen 145.870 as our uplink frequency our downlink frequency will be :

-116.5 + 145.870 or 29.37 MHz.

First tune across the band on 10 meters (29.36-29.4) and you should hear stations. CW will be towards the lower end and SSB in the middle to upper parts. You may even hear the Robot/Beacon on 29.403. Now pick your uplink frequency, say 144.880 and calculate your downlink frequency which will come out to be 29.380. Talk into your mike (Testing 1.2.3 or whatever and your callsign) and slowly tune your receiver around 29.380 and you will soon hear your own voice. Now you have found your downlink. Now go ahead and call CQ a couple of times. Keep it short because you don't have a whole lot of time. Somebody will hear you and respond and you will have your first QSO but as you talk, the satellite is moving so you will have to adjust your uplink frequency so as to keep within your downlink. If you have a steerable antenna on 2 meters you will also have to take care of that.

This is truly the fun part, trying to work all the knobs, turn the antenna, log the QSO all while you are talking. This all takes some practice but you will soon become very proficient at it. The secret is to find your downlink quickly. If you hear someone calling CQ then quickly note the frequency, calculate your uplink and tune your transmitter so you can quickly respond when he stands by.

It is best when working satellites to get into the habit of stating what satellite when calling CQ. For example you should call CQ RS-10 in this case. The reason for this is that you are transmitting on 2 meters. Now just think what would happen if some unsuspecting soul happened to be scanning 2 meter sideband and hears you calling CQ with a 20 over signal. Although this portion of the 2 meter band is set aside for satellites some do not realize this. So he now starts trying to respond to your CQ and gets really mad that you are ignoring him. Another reason is that 145.88 is within the uplink to AO-13 so if you hear someone calling CQ and you try to respond and he ignores you then you would get mad. If he was calling CQ Oscar or CQ AO13 then you would know it would be a waste of time calling him.

When finding your downlink I prefer to use CW. Just transmit a series of dots and you will easily find your downlink. Having done this then switch to SSB if that is the mode you want to use. Please remember NO FM.

I will leave you to figure out how to work RS-12. However to do this you need an advanced or extra class license as this is the portion of the 15 meter band it uses. RS-11 and RS-13 are not active at the time of writing.

In conclusion here is another more challenging thing to try. The RS satellites also carry unique devices known as Robots. When they are active they call CQ about once per minute on CW. To answer a Robot, your signal must be within its 2khz wide receive window. Don't forget to take the Doppler shift into consideration when calculating your uplink. To contact the RS-10 Robot I would send:

RS10 DE KI6QE AR

If I am lucky I will hear the response

KI6QE DE RS10 QSO NR 987 OP ROBOT TU FR QSO 73 SK

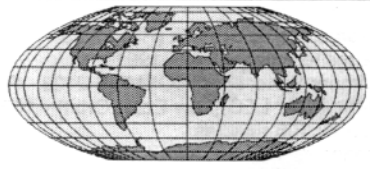
Good luck and happy satelliting.

73, de David KI6QE/VK2IMJ

The International Scene

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

received from various sources



ZF ZF ZF ZF ZF

Jack Hollingsworth ZF1JH writes about an old subject with a new twist, one that is worth serious discussion. And he obviously has more than a passing interest in and knowledge of the subject.

"I found the article 'Data Speed Tests' by Marvin Bernstein in the July issue both interesting and informative. However, I do have a suggestion for this and any future comparisons of different modes: that the comparisons should not be made merely in terms of throughput in bits-per-second (which total includes system overhead), but in *useful bits-per-second per Hz of bandwidth occupied.* This takes into account not only the data rate achieved by a particular mode but the efficiency with which that mode utilizes the bandwidth it occupies. This makes for a more realistic comparison. For example, under ideal conditions the figures for *bps* even for HF packet look good compared to the other modes. But the *bps/Hz* tells another story all together. My own researches (if they might be so dignified!) indicate that currently the 'state-of-the-art' for raw data throughput is probably something in the order of 0.7 to 1 bit/sec/Hz for sophisticated modes such as Clover II and Pactor II.

Further, the figure for bandwidth occupied should be that *actually utilized* by the transmitted signal at say -60dB (if necessary under two sets of conditions, with only the filtering provided by the modem and the transceiver with its 'wide' SSB filter as utilized by many operators, and then with a transceiver filter of optimum bandwidth for the mode in use).

Lastly, that any comparisons should also include comparisons of the thresholds at which the link fails completely for each mode under various conditions—e.g. high impulsive noise, very low signal strength, high ionospheric dispersion, etc. After all, in 'chat' mode as opposed to BBS data transfer use, a mode capable of rates much in excess of normal typing speed is of academic interest, whilst one which stays linked and passes a few tenths of bits per second is of much more practical use. This type of test really sorts out the men from the boys.

The big problem with making comparisons between modes in this way is to decide how to define the bandwidth. My own inclination is to compare everything to what one might regard as current 'state-of-the-art' modes (Clover and Pactor II) by defining bandwidth at the -50dB points. This of course heavily weights the figures against the broader-band FSK-based modes with RTTY, Amtor and Pactor rating 'poor' and HF packet rating abominable! But, if a mode occupies excessive bandwidth to the detriment of other band users, I think that we have to 'tell it like it is'

However, if one applied this standard to the new FCC rules for stations operating under automatic control, the only stations which could be regarded as operating within the 600 Hz limit would be those using Clover or Pactor II. Amtor (with a -50dB bandwidth of 1. Khz without additional filtering) certainly occupies more than 500Hz and so do Pactor even at 100 baud! The FCC rules do not specify the signal level at which bandwidth should be measured, so they provide no guide, although we must assume that emissions outside the specified 500Hz channel should be so low as to be insignificant for all practical purposes (does that mean -50dB?).

If filtering is provided to limit bandwidth to 500Hz then inevitably all FSK-based modes suffer a deterioration in ability to copy in the presence of noise and interference. And the higher the baud rate the greater the impairment. So, do we limit the bandwidth to 500Hz at -50dB (even though in practice few stations do) and then compare performances, knowing that they will have deteriorated as a result of the restricted bandwidth? Or do we measure it at -50dB and then apply an adverse weighting factor, taking into account the bandwidth actually occupied in practice? Or do we apply a figure other than -50dB to define bandwidth and if so what and why? An interesting subject for debate!

I feel that there is a tendency to automatically assume that all data modes other than HF packet are narrow-band, meaning they are confined to a 500Hz channel. This is, of course, far from the case. As for HF packet, I have yet to reconcile the fact that having quick SSB contact in a 2.7Khz bandwidth on 30 meters, even for those of us whose licenses permit this, is cause for complaint. Yet, HF packet stations in that band can occupy the same bandwidth (at -50dB) around the clock without comment! The reprint of the chart from HAL Communications demonstrates many of these points."

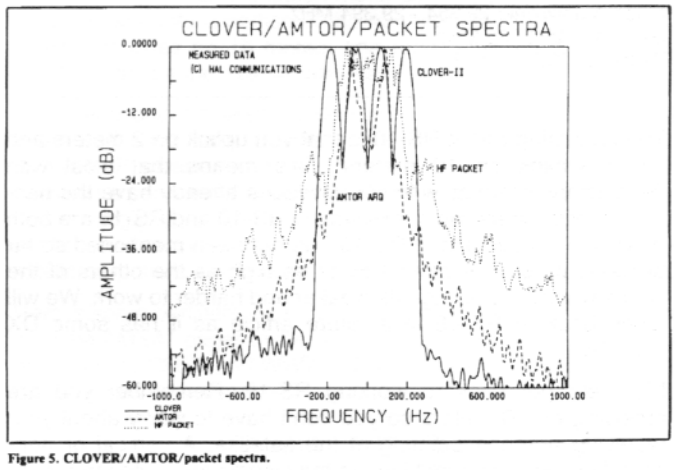


Figure 5. CLOVER/AMTOR/packet spectra.

When asked by this correspondent who lives somewhat north of the Caymans, Jack went on to say that "Suffice it to say that I too have been disappointed by the concentration in Clover software development on the high-speed 'bulk' data transmission, to the detriment of the chat mode. It seems to me that anything in excess of 120 bits per second total throughput is a waste even for two operators typing at a reasonable speed." Jack's solution is to create a new mode that might cut Clover in half and develop a 'chat' mode that will handle all the data two typists can produce and do it in a 250Hz bandwidth. That idea seems to be picking up steam and has a great deal of merit for it potentially doubles our spectrum. I am certain we shall hear more about this concept from other sources. But this stubborn old editor says that the real challenge we face is not technological. Rather, it is to exploit our opportunity by utilizing a mode like Clover to its fullest extent within the confines of a friendly QSO. Chat, transfer data, pictures, sounds, sketches and pack that 500Hz bandwidth to the fullest extent with all the components of a full, satisfying exchange with an old or new friend. And you'll never worry about underutilizing bandwidth again!

HB HB HB HB HB

Peter TY1PS E-mails from Germany after a brief holiday in the middle of the Alps: "I finally got into CIS again. I was unable to get my modem hooked up the Swiss phone system from our mountain hideaway. First, I found the phone here is regarded as piece of high-value gear, securely screwed to the table with the cable well hidden and disappearing into a black hole somewhere deep under the bed. I called the front desk but quickly understood that they have never heard of modems and E-mail: 'We do have a Telex machine at your service down here, sir.' I ended up splicing the phone wire with my nail scissors and getting my wires tapped to the line. But next, their system did not seem to understand tone or pulse dial. I had to use the normal phone to dial and then have the modem take over. I never made it into CIS as my modem was not willing to talk to the other end. I thought we were in the information age . . . seems not quite yet!"

BARTG

Here's more news about Bob (see also The Contest Chair): "Bob G0ARF (also GB2ATG and editor—BARTG's on-air bulletin service) will be receiving the ROTAB trophy at the RSGB's HF Convention this year (it happens to be held on the same weekend as the BARTG rally).

ROTAB in the acronym for (if memory works!) the **Royal Order of Transatlantic Brass Pounders**. The ROTAB trophy is awarded for outstanding DX work and Bob gets it by virtue of being a UK RTTY station of rather outstanding caliber. Drop him an email: <bcanning@kc3ltd.dircon.co.uk. It surely would be appreciated."

73, Ian G4EAN @ GB7BAD or ibx @ cs.nott.ac.uk (Secretary of BARTG - British Amateur Radio Teledata Group)

This note courtesy of Andy G3ZYP, Publicity Chairman for BARTG, who makes good use of the Internet. These tidbits are extracted from the on-air bulletins produced by GB2ATG (once again, Bob G0ARF).

"BARTG caters for all DATA interests with information, components, kits, ready built units and professional software for the PC. And other computers covering all common data modes.

The BARTG **New Improved MultyTerm** terminal unit for RTTY, Amtor, Pactor and CW transceive, plus FAX and SSTV receive (when used with the BMKMULTY software) conforms to the EEC Standard EN 50082-1:1993. For details, please contact BARTG Components Manager, Ken Godwin (G0PCA). 11, St. Lukes way, Allhallows, Kent ME3 9PR. enclosing SASE. Telephone - 01634 271548.

Members receive a quarterly journal devoted to data modes. Beginners guides, which are currently being updated for most datamodes, are available.

Please address enquiries to:
Membership secretary, Peter Adams (G6LZB), 464, Whippendell Road, Watford, Herts. WD1 7PT. enclosing SASE. Telephone - 01923 220774."

And, finally, Ian G4EAN tells us that at the 19th August committee meeting, BARTG agreed to accept $40 in bills from USA people wishing to join BARTG? Bills travel at sender's risk and, "NO, we can't take cheques (because of the high exchange levies charged by the banks) nor are we able to accept credit cards (because from the low level of demand the cost per transaction would be uncomfortably high)."
Ian.

DK DK DK DK DK

Fred DK4ZC writes about his engineering skills and about combining rest, relaxation, wine and TV with Clover! Not a bad mixture.

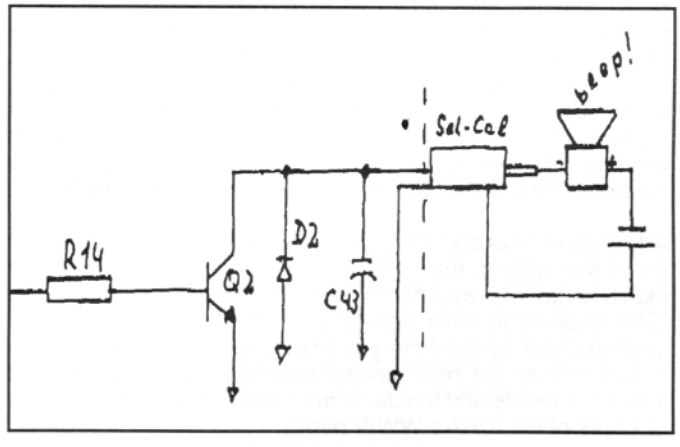
Don't Miss Your Sked

"Two years ago when we received our PCI 4000 board from HAL, it was quite difficult to find a station which also used this exciting new mode. We, that is Glauco I3FWY and myself, had to learn all about the new mode and did it by testing. But for testing you need time and Glauco had not much time as he is not yet retired like me, and thus had to work all day long. There were only 10-15 minutes left during his lunch break and 'after my dinner' and he used to say. But what means 'after dinner?' At 9:30-10:00PM local? At that time I usually have a glass of wine with my XYL and maybe watch TV. And the radio is on the second floor! Hurrying up the steps every two minutes would be good for my health but my XYL does not like it and the noise coming from the loudspeaker of my transceiver gets on my nerves.

What to do? I read the PCI 4000 manual two times and studied the circuits. There was a connector called Sel-Cal. The circuit showed me that there is nothing behind it but an NPN transistor which is triggered when the PCI 4000 sees my callsign. This is it! Into the junk box I went and found a beeper from an old computer board and a middle-aged 9 volt battery. I connected the (-) end of the beeper to the inner connector of the Sel-Cal. Then the (+) end of the beeper went to the (+) side of the battery and the (-) of the battery to the outer connector of the Sel-Cal plug. No more hurrying up the steps or listening to the noise floor. We now—the XYL and myself—enjoy the wine and watch TV until the beeper tells me that Glauco has linked with my station and wants no more testing but chatting with me.

A long time later, when we already used Express 2.4, I got the idea that it would be nice if the beeper would also sound when the PCI monitors a CQ call, or even traffic on the frequency. I connected with Peter (TY1PS) and asked him if he could install this in version 3. He agreed and now you will find it in the Setup screen, three buttons under 'Alert.' They are called Link, CQ and Monitor. Switch them on, connect a beeper and you will be informed—if you like what happens on frequency. Sorry, but there is a bug in 3.0 concerning CQ and Monitor. But the bug will soon be killed.

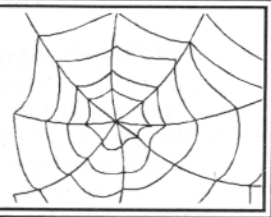
WARNING! The transistor of the Sel-Cal output will handle only 100 mAmps! If you want to be called when you are doing your garden work or when you are sitting on top of your tower, you should connect a relay to the Sel-Cal output instead of a beeper, then an alarm bell connected to the 120 volt line!"



IDRA's Presence on the Internet

and the implications of the Internet to the future of Digital Mode Ham Radio Operations

By Paul S. Richter, W4ZB • P.O. Box 19190 • Washington, DC 20036-9190
CompuServe: 70743,3517



PART III

The IDRA's Internet presence was previously described in the June and July, 1995 issues of the Digital Journal. It continues to grow in popularity as measured by the number of accesses from sources all over the world. The IDRA WWW (World Wide Web) Server is at http://www.iea.com/~adrs and the anonymous FTP Server is at ftp://ftp.iea.com/public/adrs .

General Update on Internet Developments

So much is now being published about the Internet in the general media, in the computer related press and in other ham related publications that active digital mode ham operators who want to keep up with current developments can no longer ignore these still relatively new developments. And this is not just an activity for the younger generation which has grown up since personal computers have proliferated. I recently listened in on a local QCWA net in the Washington, D.C. area, and most of the hams who had held licenses for 50 years or more either already had or were actively considering obtaining Internet access!

Fortunately, obtaining access to the Internet is becoming easier and easier, and much less expensive for high quality SLIP/PPP connections. You should consult other hams or computer equipment suppliers in your local area to determine the "best" way to get connected in your area. A local posting on your DX PacketCluster or VHF/UHF BBS should bring many responses. Another helpful development: software suppliers have now developed Internet interface products which install themselves on the user's computer (almost) automatically. As a result, individuals with minimal technical skills may join in on the fun and most of these software products are adaptable to ham uses.

The extremely rapid growth in the number of active Internet users is causing noticeable network connection speed slow downs (i.e. congestion) between particular points during peak usage times as observed by this writer, but network providers are responding by adding more capacity to keep up with the demand and remain competitive. At the same time, users are also seeking faster and faster transmission speeds which will be forthcoming in response to the demand. I recently visited a local computer store to pick up a 28.8 kbps modem for use at home with a dial up PPP connection. To my surprise, one of the salesmen actively discouraged the purchase of such a modem. His reasoning: low cost 128kbps ISDN residential connections would shortly be available in the area. The necessary ISDN modems for that new service are expected to cost about $250 which is only a little more than the current top quality 28.8 kbps modems. Things are changing (and improving) very rapidly!

Addition of "Forms" Capability to the IDRA WWW Server

As of this writing, the IDRA WWW Server has a number of experimental two way "forms" operating in test mode, and the IDRA expects to have several of those "forms" operating for general users by the time you read this. More "forms" will be activated over the next several months as time permits and additional needs and functions are identified. Look for forms in all areas of the IDRA's WWW pages.

"Forms" are a facility of the HTTP protocol (HyperText Transfer Protocol) which, if suitably implemented on the server, and provided to the user permits each user to communicate complex information in a manner so that the WWW Server may capture, store, process and/or forward that information. In the most common form of user/server interaction, the user requests the server to provide a succession of HTML (HyperText Markup Language) pages to the user. The user accomplishes his selection by "clicking" on hyperlinks in the HTML documents which the user has already received from the server. Each such selection generates a new GET request to the server requesting the server to provide specified HTML documents or other files. With this type of operation, the server retains no "memory" of any prior interactions with a particular user, and the user communicates no information to the server other than a succession of GET requests.

While this most common form of user/server interaction has great utility, "forms" which utilize the CGI (Common Gateway Interface) on the WWW server can create great additional utility. The CGI on the server permits the user to communicate user specific information to the server. This takes place through the use of a suitably designed HTML "form" document operating in combination custom designed "form" processing programs resident at the server.

HTML "forms" allow a variety of types of information to be sent by the user to the server. It can handle; text information in response to specific questions on the "form"; free text information written by the user in response to a general inquiry or solicitation; "check box" selection information ; "radio button" selections on the "form", etc. The information solicited by a "form", for example, may include the user's name, callsign, mailing address and e-mail address, or free text comments on a particular subject or even new or renewal membership information.

When the user "clicks" on the "submit" button on the user filled-in HTML "form",which the user obtained from the WWW server, the completed "form" information is sent back to the server. The server then recognizes the incoming information as a "form" submission by a user. The server also knows that it requires the use of a particular "form" processing. That program is then called so that the information may be processed in a predetermined manner. The "submit" button on the "form" contains hyperlink information and identifies for the server the particular "form" processing program to be activated.

A well designed forms processing program should perform several functions when it receives "form" data. First, the program will generate and send a custom message back to the user to acknowledge receipt of the information. Next, the processing program will need to extract and reorganize the data elements from the incoming forms data submission. The extracted and reorganized data elements may then be stored in a data file or placed into an e-mail message to be forwarded to predetermined e-mail address(es). More complex programs arrangements may, for example, receive and process user identification (or authentication) data to permit only authorized users to have access to other facilities on the server.

Still other program arrangements can use user supplied data to conduct database searches and report the results of such searches back to the user.

As previously noted, the particular server at the present IDRA WWW site runs on a Unix based computer. Accordingly, the "forms" processing programs which interact with the HTTP CGI on our server may be of any type or combination capable of being executed on that Unix platform. This, of course, includes compiled C programs, Unix script programs, and most importantly, at least as far as IDRA's efforts to date are concerned, scripts written for the PERL (Practical Extraction and Reporting Language) interpreter. We mention these details both because many of the DJ's readers are curious about how the "forms" functions on the IDRA's server work, but also because it is important for everyone to understand the basic concepts involved. Many future digital communications systems, including those used in ham radio, will utilize these concepts.

IDRA's New PGP Public Encryption Key

In July, the IDRA announced and published on its WWW server a PGP public encryption key for the IDRA. The primary motivation for that was to facilitate use of credit card transactions over the Internet without concern by the user that his credit card number might be intercepted or misused by an unauthorized "hacker". Within one day of the initial posting on the WWW server, the IDRA received its first encrypted order for a software item from the Software Store! It works! Those readers who are not now familiar with the very high quality, PGP public key encryption software which is available as "freeware" and its uses should look at the information posted on IDRA's WWW server for further details.

Some may question why we should be interested at all in digital encryption systems if encryption is illegal for ham radio use? Answer: encryption schemes not illegal in all ham radio uses. Under the FCC's rules encryption is prohibited only when its purpose is to obscure the meaning of messages. Encryption schemes may be validly used under the FCC's rules, for example, for over the air user (or callsign) authentication purposes. The PGP public key encryption software, for example, has digital signature facilities which can be utilized with very simple hand-shaking exchanges to uniquely identify (authenticate) a source.

Callsign pirating in ham radio can now be easily detected with simple digital signature authentication schemes! The technology has moved so rapidly that such schemes now available for ham radio use make the current North American cellular telephone ESN (Electronic Serial Number) authentication scheme look primitive. (The ESN system is now extremely vulnerable to over the air interception and illegal cell-phone "cloning".) How this may be accomplished with public key encryption software is a subject for another day!

Digital Mode Ham Product Literature On IDRA WWW Server

The IDRA WWW server now includes pages of literature for products of particular interest to digital mode hams. And more will be added. IDRA expects also to be adding "forms" to facilitate inquiries directly to the manufacturers. An extensive technical discussion of Clover II from HAL as well as HAL's full range of digital mode communications products has been posted.

Tables of Contents for the Digital Journal - Electronic Publishing

The IDRA's WWW server will, by the time you read this, be carrying each month, the full table of contents for each issue of the Digital Journal, together with one or more feature articles. Publication of the feature articles will be slightly delayed. The IDRA is also considering the possibility of electronically distributing copies of the Digital Journal via e-mail or ftp. Interest in doing this is being driven by high postage costs and delays experienced outside of North America in receiving printed copies sent by mail.

Getting Accurate Time Over the Internet!

Most digital mode hams know that very accurate time, within a fraction of a second, can be obtained by modem using time setting software by a dial up telephone call to one of the national standard time services. Similar services are now available over the Internet, including over the WWW. See, for example, http://tycho.usno.navy.mil which provides time from the U.S. Naval Observatory in Washington, D.C. Even more accurate time setting is available via Telnet connections in which path delay can be accurately measured. IDRA intends to set up a "form" so that accurate time can also be obtained from its WWW server!

Internet Conference Connections Using IRC Facilities

One common type of Internet client application is known as the IRC (Internet Relay Chat-*not International Reply Coupons*!). A user may use his IRC client application to connect over the Internet to a nearby IRC server. The different IRC servers throughout the world are themselves interconnected. Once connected to an IRC server, the user may obtain a list and brief description of all existing public channels or conferences groups worldwide. The user may then "join" any such group. Once in a particular conference group, all parties to the conference may communicate with each other via keyboard in a manner similar to what occurs on a VHF/UHF AX-25 packet conference node.

A lot of the IRC activity which I have observed in many public conferences appears to be mindless, but the utility of these facilities for disseminating and exchanging information for ham radio operations should not be overlooked. Several ham organizations (such as Amsat) now hold scheduled over the Internet IRC conferences to disseminate and exchange information. Knowledgeable IRC users may set up conference channels or groups which are open only to predetermined participants who have the necessary information on how to join. Such arrangements result effectively in "private" conference connections for the parties participating only who may knowledgeable IRC user may also set up a conference group to operate in a "broadcast only" mode so that all users connected to a particular conference can see all messages, but messages can be originated only from a small group of authorized message originators.

The uses for these types of Internet IRC facilities are obvious for certain ham radio related activities. A IRC conference can be used in anticipation of establishing a QSO over a particular radio channel or to coordinate the testing of radio propagation between particular discrete points. How long will it be before IRC channels are used to set up to control DX calling lists? No worry about QRMing net control in that situation! A "spotter" IRC channel may be set up to feed contest "spots" to the connected parties. The possibilities for enhancing the enjoyment of over the air radio operation are almost unlimited.

Transferring Files Using FTP With SLIP/PPP Connections

Pairs of Internet users, each with SLIP or PPP type connections, should be aware that they can transfer files, binary and otherwise, between themselves over the Internet using FTP. This is a very useful facility especially for file transfers between users at great distances. To do this requires the following: (1) at least one user needs to have FTP server software which he can run on his computer once it is connected to the Internet; and (2) each user needs to know or be able to obtain the cur-

(Cont'd on page 16)

DX News

The latest digi-doings from around the globe

by Jules Freundlich, W2JGR • 825 Summit Ave., Apt. 1401 • Minneapolis, MN 55403

Are we at the start of Solar Cycle 23? Some say yes, some say no.

It's always fun to read forecasts from several sources as to when we will reach the Solar minimum of Cycle 22, and when Cycle 23 will start. In mid-August we found some interesting opinions on the subject. In his propagation forecast ARRL Bulletin 35 dated August 18, 1995, Todd, KT7H, said this: "The latest prediction for the rest of this solar cycle shows a slight rise in solar flux this fall before the bottom of the cycle around June through December, 1996. Flux should be back up around current levels around April 1997. The peak in solar flux for the next cycle is projected for August, 2000."

A few days after this bulletin the following message from NA5N appeared on several reflectors on the Internet. It caused a few hearts to beat a little faster. "NEXT SOLAR CYCLE BEGINS"

There is not much an observatory has to offer ham radio, but this is too pertinent to ignore. As we all know, we are sitting at dead bottom of the solar cycle....a period of extreme solar "quiet" (minimum) conditions. From a communications standpoint, you plot solar activity (various indexes or sunspot counts) to determine when the next cycle begins, but this method identifies the next solar cycle months after the fact. From an astronomy and observational standpoint, there are two distinct conditions that identify the end of one cycle and the beginning of the next: 1. During a solar MINIMUM - sunspots are rare and when they do occur, are located along the sun's equator within +/- 7 degrees. 2. During a solar MAXIMUM - sunspots become numerous and are located at much higher latitudes on the solar disk, above 30 degrees. 3. The magnetic polarity of sunspots reverses from one cycle to the next.

"The first sunspot above the equator since early 1994 was observed Saturday August 12, 1995 at the Big Bear Solar Observatory operated by Cal Tech. The sunspot was observed at 21 degrees north latitude and was of OPPOSITE polarity from all sunspots since 1984...identifying the start of the new solar cycle. Thus the next solar cycle began August 12, 1995, a bit ahead of forecasts. This suggests that improved HF propagation could be evident as early as next spring and summer, depending on the rate of increase of solar activity. 'You heard it here first from the world's largest radio telescope in Socorro, NM (humbly referred to as the *center of the universe*) Good DX, Paul NA5N NATIONAL RADIO ASTRONOMY OBSERVATORY ——Socorro, New Mexico."

While some of us were reveling in the above statement, a few days later we read a gentle reminder that pulled us back to earth. Sheldon, W6EL, author of the popular Miniprop Plus (R) software had this to say:

"Other postings to the contrary, the first sunspot of a new cycle does not mean that the sunspot minimum between cycles has occurred. There is an overlap period during which spots from both the old cycle and the new cycle appear. The month of the sunspot minimum is the month in which the smoothed 12-month running average sunspot number (counting sunspots from both cycles) is a minimum.

"The first sunspot of cycle 20 appeared in September 1963, but the sunspot minimum between cycles 19 and 20 did not occur until October 1964. The minimum between cycles 22 and 23 probably will not occur until some time in 1996. Sorry. de Shel, W6EL"

Shel's explanation made sense to me. For verification, I went to my old trusty copy (autographed by the authors) of 'The Shortwave Propagation Handbook' by George Jacobs, W3ASK, and Ted Cohen, N4XX, and sure enough this very situation is graphically demonstrated there with data and diagrams. At the very least we can thank Paul, NA5N, for his revelation that, indeed, the expected has happened; spots having characteristics which presage the next cycle have begun to be observed. His enthusiasm, however, as announcing that it represents the START of a new cycle, seems to be at variance with the definiton accepted by radio communicators. Perhaps the astronomers view the situation from a different perspective. After all, HF radio propagation seems to be dependent mostly on the number of sunspots, not their polarity or latitude. And that is what we radio people are most concerned with.

Much has been written in recent years about how the advent of VHF Packetcluster® software developed by Dick Newell, AK1A, has revolutionized the way we DXers pursue our prey. Note the operative word is VHF. What about the folks that live in the outlands, far from the reach of the two meter cluster nodes. Take the case of Bill Mullin, AA4M, a dyed in the wool DXer with many awards to his credit. Bill, became an ardent RTTYer when he reached top standing on other modes. He most recently lived in a area in California that allowed him easy access to VHF clusters. He was thus able to stay current with the latest appearances of DX of his interest, and to enjoy the many other benefits available, such as QSL info, WWV trends, etc.

As many of us do, Bill retired on a fixed income. He moved to south-central Missouri to a location that is too far for ground wave propagation, and too close for skip to his nearest node WD5B. Much cluster information is now passed between nodes via HF, mainly on 30 and 40 meters, creating in essence a Wide Area Network (WAN). Because of this WAN, DX spots from both coasts show up in the midwest, and vice versa. Some of this traffic does bounce along by seemingly endless VHF relays, but the HF traffic is substantial. If people in isolated locations like Bill could have access to, say the 30 or 40 meters gateways they could stay current with cluster traffic. Bill has attempted on several occasions to gain access to some of the gateways. In all cases he has been denied access by the sysops.

I have been informed by one of the 30 meter gateway sysops that such denial of access exists because of the very limited protocol under which they operate. Since the 'overhead', and retries is said to be incredible, the word is NO USERS, NODES ONLY. It was opined that someone has written software to actually 'decode' the HF Packetcluster data flowing by on the HF link to simulate connection to a node. By just monitoring the frequency, you can see the data flowing by. This would be a perfect solution to this dilemna. The 'user' could lift the information without interfering with the gateway operation. If anyone out there in digital-land knows of such software, please let us know. There will be more than a few grateful recipients.

When we talk of chasing DX, most of our reference is to countries outside of the U.S.A. But to DXers in other lands contacts in the U.S. represent wanted DX. This is true especially of those seeking to achieve WAS. It often amazes me to see a European pileup on an American station. So when speaking of DXpeditions, you might consider setting out to some rare state to help satisfy the needs of DX stations.

Erik, SM5EIT, suggests that expeditions to rare states such as West Virginia, Delaware, the Dakotas, Wyoming, New Hampshire. Vermont, etc. be organized and announced ahead of time with all the hoopla normally associated with the planning and publicizing of trips to far away exotic islands. The relative ease of such stateside operations, and the minimal costs involved compared to the 'biggies', make for an interesting alternative type of DXpedition. I wonder how much support might be forthcoming, for instance. to suppport a weeklong 'DXpedition' to Wyoming, Delaware, or West Virginia? Any volunteers?

DX DOINGS

(Signals are 45.5 Baud RTTY unless noted.)

Note that the DX Doings below include activity as reported from worldwide sources. Therefore, some stations may not be seen, in your particular part of the world, at the hours indicated. To make best use of the data given, couple it with your knowledge of propagation paths to your QTH. For help in this regard, see the monthly propagation charts in QST, and listen to the hourly propagation forecasts at 18 minutes past each hour on WWV. Good luck!

ASIATIC RUSSIA, RK9 - You can usually find Serge at the keyboard at the record breaking station RK9CWA on 20 meters around 2330Z to 2400Z. He sometimes appears as early as 1530Z. QSL direct to UA9CGA, Serge V. Stikhin, P.O. Box 1035, Ekaterinburg, 620063, Russian Federation. Do NOT send currency. Use IRC's only.

CAMEROON, TJ - TJ1GD can be found at the high end of the 20 meter RTTY slot around 2200Z. QSL via SP9CLQ.

CAYMAN IS, ZF - For a Pactor QSO with ZF2WM, look for him on 14069 around 0400Z. QSL route is needed.

COCOS IS. - TI9 - During his recent trip to Cocos Island, TI9JJP confirmed that he had no RTTY equipment with him. but did say he would operate RTTY during a return trip in October. As of late August, no dates were known.

COLOMBIA, HK - HK3BZO operates Pactor on 14070 khz around 2200Z. QSL via CBA.

EAST MALAYSIA, 9M - 9M8BT is active on 20 meters around 1430Z. A sure QSL is guaranteed from N5FTR.

GHANA, 9G - John, 9G1BS is still in there, on 20 meters, giving a new one to the deserving. Look for him between 1400Z and 1530Z, as well as late as 2115Z. QSL to John Barbat-Soskos, P.O. Box 3248, Accra, Ghana.

GREECE, SV - In addition to SV8CS and SV2DGH mentioned last month, SV1BSX and SV0IE can both be found between 2300Z and 2400Z on 20 meters. QSL routes are need for both stations.

GUANTANAMO BAY, KG4 - KG4NR likes 20 meters around 1400Z. QSL route is needed.

ISLE OF MAN, GD - GD4EBA now operates on 20 meters as early in the UTC day as 0815Z, in addition to the later time slot mentioned in the August DJ. QSL via CBA.

IVORY COAST, TU - If you would like a Pactor QSO with TU5DR, look for him on 14070 around 2200Z. QSL route is needed.

JAPAN, JA - For prefix hunters here's an unusual one. During the Ginnic World Championships in Sabae between 1 and 10 October, 8J9WGC will be operational on all bands and modes, including RTTY. All QSOs will be QSL'd via the bureau.

KALININGRAD, UA2 - A new addition to RTTY is RA2FS who can be found on 20 meters around either 1230Z or 2230Z. QSL route is needed.

KERGUELEN Is., FT8X - Jean Jacques, FB1LYF (ex J28CW) will be on Kerguelen for one year, starting in November. We do not know if he will have RTTY, but Don, W6PQS, of the International RTTY DX Association has advised him that RTTY gear is available on loan. Watch the weekly VK2SG RTTY DX Notes for updates.

KYRGHYSTAN, EX - If you worked Wolfgang, EK/DK7UY during early September. QSL to his home call, only via the bureau.

MADAGASCAR, 5R - Shun, JF1MGI/5R8EU had to postpone his scheduled August/September trip because of professional commitments in Japan. He promised that he would go to 5R during October or November. No dates have yet been announced. Watch the weekly VK2SG RTTY DX Notes for updates.

MONGOLIA, JT - JT1CS has been active on 20 meters between 1230Z and 1315Z. NEW CALEDONIA, FK - FK8HC sometimes can be found on Amtor near 14073 khz around 0530Z. QSL to P.O. Box 7636, Ducos, 98801 Noumea, New Caledonia.

POLAND, 3Z - The interesting callsign 3Z0RY appears around 2100Z on 20 meters. I would like to know what the significance of the uncommon prefix 3Z is. QSL to K.Krassowski, Box 21, Olsztyn 1, 10-950 Poland.

QATAR, A7 - Two on the digital modes are A71BH and A71CW, both of which operate 20 meters around 1100Z. QSL A71BH via OE6EEG. QSL A71CW to Chris Dabrowski, Box 22101, Doha, Qatar.

TONGA, A3 - A35CJ nay be found on Pactor on 14070 khz around 0430Z. A little later, around 0600Z, you may spot A35KB on 20 meters. QSL routes are needed for both.

UKRAINE, UR - UR5EDU is one of the most prominent signals out of Ukraine. This is not surpsing when you consider he uses a 3 element quad for 10/15/20 meters, and a 4 element Yagi for 40 meters. Look on 20 meters around 1300Z to 1500Z or between 2000Z and 2200Z. QSL via UB5EDU. Other stations active from here include UY9EJ, UT7FJ, UX2FXX, UX1CN, UX4UA, UT9FJ.

VIETNAM, 3W - 3W5FM (home call UA0FM) will continue to be active on both RTTY and SSB until some time in October. He usually is on the low end of the 20m RTTY slot around 1200-1300Z and 1800-1900Z. He is running 400 watts to a 2 element quad on this band. He has confirmed to Shun, JF1MGI that he has a valid license, a copy of which was sent to the ARRL in May. His wife apparently handles his QSLing for him. Send your QSL with IRC's and an SAE to P.O. Box 66, Vladimir 600011, Russia. QSLs have been receoved.

CLOVER ACTIVITY PICKS UP

With advent on the scene of the attractively priced P-38 multimode controller board by HAL Communications, and the ready availability of third party software like Jim Jennings' RagChew, and EXPRESS 3.01 by Peter, TY1PS, there has been a pickup in Clover DX operations. I use both those programs with a PCI-4000/M. Prior to the appearance of the P-38, I had never been able to find a DX station on Clover, except TY1PS. I recently snagged Mike, CP5VW and Dennis, VK4DAE, both of whom are using the P-38. Lots of new stateside stations are also active. 14065.5 khz. seems to be the hangout for the moment. As the activity grows, obviously the Clover folks will have to expand their using spectrum. Let's keep it below 14080 khz. 14080 to 14090 should still be the domain for RTTY. Incidentally, I have also noticed an increase in RTTY activity as a result of the P-38 usage.

As band openings permit, try also 21065.5, 10136.5, 7065.5, and 3565.5 khz. LSB, for Clover.

MISCELLANY

Once again we have been cautioned by James, 9V1YC, against sending U.S. greenstamps to most countries in Southeast Asia (VU, S2, 9N, AP, 4S7, 9V). They will most certainly be stolen from your envelope. James complained to his local postal authorities that his mail was being opened, and the money taken from them. They adamantly denied the problem. It was obvious to him. He gave up and found a QSL Manager (AA5BT) in the U.S.A. James further advises to play it safe, keep your greenstamps. He advises always to use IRC's or local stamped SASE's when QSLing outside your country.

I received a note via VHF packet from Vollie, WB4TDB, who commented how much he enjoys the DJ's DX NEWS column. Thanks Vollie. Vollie has been active in ham radio RTTY since 1977. He is

an old hand at the keyboard, though, having started with the United States Air Force in 1961. Curiously enough, he got his start by the efforts of W0EQE, here in Minneapolis. Vollie has used everything from the old M-15 up. He does admit liking today's computer based operation better than the old iron horses.

He has worked more of his share of RTTY DX, and has promised himself one of these days he will get all of his cards together and see just what he has. Vollie tells me his most interesting experience was in April and May of 1992 when he was guest operator on Crete as WB4TDB/SV9. He operated from the shack of SV0DV/9 (better known now as W0PU, Hal). He enjoyed being on the DX end of RTTY and still gets QSLs from that little excursion. Yes, I know about late QSLers, Vollie. I still get cards from my 1986 operation at VP2M. Thanks for the note. It's always fun to hear from the RTTY gang, home or abroad.

VP2MO

Sir Errol "Bobby" Martin, VP2MO, was seriously injured, in late August, in an automobile accident when his car collided with a military vehicle on Montserrat. His wife, Mae, was instantly killed. Bobby was evacuated to a hospital in Antigua, where, as of the beginning of September he was in critical condition, but expected to recover from his multiple injuries. Bobby and his wife had been evacuated from their home because of the volcanic activity of Monserrat's famed 'Soufriere'. They were reportedly returning to their home to retrieve his radio equipment.

In the late 1980's Bobby was a very active RTTYer, and gave VP2M, as a new RTTY country, to many of us. In recent years he had been one of the net controllers on the SSB INDEXA DX net. In July 1986, four of us from the Long Island DX Association, including Ed, K2MFY, Charlie, KD2SX (now WZ1R), and Jay, K2OVS, spent a week on Montserrat for a Caribbean DXpedition. Bobby Martin was our facilitator. He arranged to have us slide though customs unimpeded. He arranged for the PTT representative to come to the airport to present us with our licenses. He made sure that Chod Harris' "Spanish Point" villa was in order with all conveniences working, and in short, made us completely welcome in his environment. We never quite knew how Bobby managed to be so knowledgeable about everything, but we gladly accepted his hospitality.

That was the first year of the IARU International DX contest. Bobby arranged for us to operate as a Headquarters station, using the callsign, VP2M. We did not break any records, but you can be sure we enjoyed it.

On the last day of our trip, Bobby arranged for us to go on a sightseeing trip. One of our last visits, ironically, was to climb down into 'Soufriere'. We chuckled at wisps of smelly steam issuing from between the rocks, and gawked where the top of the volcano had been sheared off, sometime in the 60's, by an ill-fated commercial airliner.

Bobby earned the title "Sir" in 1990 when the Queen of England bestowed British knighthood on him for his outstanding effort in establishing communications after Hurricane Hugo devastated the island in 1989.

Bobby's radio equipment filled an entire wall of shelves at the end of his bedroom. Much of it was donated to him by an appreciative amateur world. We fervently hope that he will fully recover so as to be able to use it soon again.

As this is being written, in early September, a fund is being established for the benefit of Bobby and his four children. Details should be available, by now, in current bulletins and other ham publications, as to where donations can be sent. Be generous. We fervently hope, as you read this, that Bobby is well on his way to recovery.

HAVE DX NEWS?

Leave a Pactor message at W5KSI.#NOLA.LA.USA.NOAM mbx (1), or via any of the following: Packet: W2JGR @ WB0GDB.#MSP.MN.USA.NA My Pactor personal MBX on 14070 khz. Internet: w2jgr@millcomm.com FAX: 612 377 3600 (mark for my attention) USPS to my CBA.

THANKS - Thanks to the following for all your information: 9V1YC, AA4M, I5FLN, IK5PWJ, JF1MGI, JH2PDS/1, K8JP, KT7H, N2VYU, NA5N, OZ4ZT, SM5EIT, UA9CR, WB4TDB, W6EL, WA0PUJ, WB2CJL, ZS5S, and 425 DX NEWS.

See you all next month. For now, bye bye from Minnesota, PAX....73 de Jules W2JGR

1. W5KSI scans 3622, 3624, 7069, 7071, 7075.5, 7076, 14068, 14070, 14073.5, 14074, 14079, 21074, 21075, and 21079 khz.

(Cont'd from page 13)

rent I.P. (Internet Protocol) number (i.e. the Internet address) for his counterpart.

Virtually all current Internet software suites supporting SLIP/PPP connections include FTP client applications which allow connection to and interaction with computers running FTP server software. Some such software collections (e.g. Internet Chameleon by Netmanage) also provide FTP server applications. A user with an FTP server application may run that application once connected to the Internet, thereby making various of the files on his computer available via FTP to remote users. Typically, the FTP server software in such a situation is configured to restrict remote user (i.e. FTP client) access to particular directories on the computer running the FTP server software or to remote users with particular I.P. numbers or passwords. Such FTP server software, however, may be configured to allow anonymous FTP access to all files on the computer.

Once the FTP server software is up and running, a remote user connected to the Internet and running an FTP client application needs to know the current I.P. number for the FTP server in order to be able to connect to that FTP server over the Internet. On the other hand, the user running the FTP server software and connected to the Internet through a dial up SLIP or PPP connection may not always have the same I.P. number. Some (many) Internet service providers dynamically assign I.P. numbers to their SLIP and PPP users at the time the initial dial up connections are established to the Internet service provider. In such cases, the remote user running the FTP client application must have some way to find out the I.P. number for his counterpart. One of the simplest ways to accomplish this is for the users to exchange this information over a predetermined IRC channel. Once the remote user running the FTP client has the I.P. number information, he can connect over the Internet to the FTP server and begin FTP operations.

Conclusions

We hesitate to offer any conclusions about the implications of the Internet to ham radio activities, except to note that many facilities of the Internet are complementary to existing digital mode ham operations and that the Internet will be "important" or "very important" for the future. The IDRA is keeping up with these advances by providing a modern WWW server and related facilities accessible over the Internet. In the near term, we can confidently expect increased and more integrated ham radio related uses of the Internet. Yet the Internet and its capabilities are now developing at such a rapid pace that its longer terms implications cannot be confidently predicted, except that we can be certain that developments relating to the Internet will have an strong impact on all other forms of digital mode communications.

Contesting

Coming Events and Awards

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

Rtty Contests - Coming Events

Date:	Contest:	
OCT 21-22 '95	JARTS WW RTTY	(Japan)
NOV 5	DARC Corona 10M Digi	(German)
NOV 11-12	WAE WW RTTY	(German)
DEC 9-10	TARA RTTY Sprint	(USA)
JAN 6-7 '96	ARRL RTTY Roundup	(USA)

— — REMINDERS — —

SARTG WW RTTY Contest
(August 19-20) log entries deadline is October 10.
Mail entry to:

Bo Ohlsson, SM4CMG
Skulsta 1258
S-710 41 FELLINGSBRO
SWEDEN

DARC Corona 10M Digi Contest
(Sept 3) log entries deadline is October 3.
Mail entry to:

Werner Ludwig, DF5BX
P.O. Box 12 70
D—49110 Georgsmarienhutte
GERMANY

CQ WW Digital Contest
(Sept 23-24) log entries deadline is December 1.
Mail entry to:

Roy Gould, KT1N
CQ WW RTTY DX Contest Director
Box DX
Stow, MA 01775
USA

— — COMING UP — —

— JARTS WW RTTY Contest —

October 21-22, 1995

Sponsored by JARTS (President: JA1ACB)
Supported by Japanese CQ Magazine (Ref: JH1BIH)

CONTEST PERIOD: Starts at 0000 UTC Saturday, and ends at 2400 UTC Sunday. You can operate all 48 hours. (No OFF periods required.)

BANDS: 80, 40, 20, 15, and 10M (five bands). Japanese RTTY segments are:

BAND	JA RTTY SEGMENT
80M	3.520 —- 3.525 MHz note!
40M	7.025 —- 7.040 MHz note!
20M	14.070 — 14.112 MHz
15M	21.070 — 21.125 MHz
10M	28.070 — 28.150 MHz

MODE: Baudot (RTTY) only.

OPERATOR CLASSES:

A) Single Operator, All Band
B) Multi-Operator, Single Transmitter
C) SWL

MESSAGE EXCHANGE: RST + Operator's age. (00 acceptable for YL and XYL) All Multi-op stations must send 99 as operator age.

QSO POINTS: Two (2) points for QSO within your own continent. Three (3) points for QSO outside your own continent.

MULTIPLIER: Each DXCC country and JA/VK/W/VE call area count as a multiplier. But you cannot count JA/VK/W/VE *country* as a multiplier. **Multiplier will count once per band**. You can count your own country or call area (JA/VK/W/VE) as a multiplier.

FINAL SCORE: Total of QSO points times total of multipliers. (For SWL's, same rules as above.

AWARDS: First place plaques to top winner in all three classes. First through fifth place will receive certificates, all three classes in each continent, if number of QSO's is reasonable. *Special award for 13th from last in all three classes.*

LOGS and SUMMARY: The logs to contain: BAND, DATE/TIME UTC, CALLSIGN, RST/AGE sent and received, MULTIPLIERS, and POINTS claimed. Any entry making more than 200 QSOs must submit duplicate checksheet. Use separate logsheets for each band, and include a Summary Sheet showing the scoring, class, your call, name and address. Multi-Op stations please include names and callsigns of all operators. Logsheets and Summary sheets are available from Contest Manager, JH1BIH.

DEADLINE: Logs must be received by December 31. Mail to:

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

COMMENTS: The JARTS WW RTTY Contest has grown to be one of the most popular and is really a lot of fun. From the clever "age exchange" we find just how young we all are, and who the bashful YL ops are, too! Band multipliers will open up ALL the bands. Note the JA RTTY segments on 40 and 80M. October propagation conditions are usually getting good again, with less low band static and better high band paths, world-wide. There are no time-off periods that must be taken, so you're free to pace yourself based on band conditions, and not on running out of time. If you don't intend to make a huge score, consider going for the award for 13th from last place in your class. It will require very precise timing and judgement on your part - and you have to send in your logs to JARTS Contest Manager, JH1BIH. Only he can decide. This is probably the most difficult award one can ever achieve in Contesting! Good Luck!

— DARC CORONA 10M Digital Contest —

November 5, 1995

Sponsored by Deutscher Amateur-Radio-Club e.V. (DARC)
(Ref: DF5BX)

NOTE: This contest occurs 4 times a year on the first Sunday of March, July, September, and November.

CONTEST PERIOD: Sunday, November 5, from 1100Z to 1700Z (6 hours)

MODES: RTTY, AMTOR, PACTOR, and CLOVER

BANDS: 10M ONLY

CLASSES: 1 - Single op 2 - SWL

CONTEST CALL: "CQ CORONA TEST"

EXCHANGE: RST + QSO number, starting with 001.

CONTACTS: Additional QSOs are allowed with same station on different mode.

MULTIPLIERS: Each DXCC/WAE country, and each call district in JA,VE,and W.

QSO POINTS: Count 1 point for each completed QSO.

(Cont'd on page 19)

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

BOB, G0ARF

Hello Contesters and DXers. This month we have the fourth running of the JARTS WW RTTY Contest. JARTS grows every year and has become very popular over the last three years and will no doubt be a big hit this year. Let.s all join in and show the JARTS community just how much we appreciate such a fine contest.

This month we will talk with Bob Canning G0ARF on Eard Island. Bob retired about four years ago on his doctors advice after spending 43 years in the construction industry. Bob says the pressures upon a contract manager paid less than the slaves he was expected to manage tends to make you feel sick, very often. Hi!

His first interest in radio of any kind arrived late in life. He always believed one needed to be a whiz kid with electronics to get anywhere near a license. His introduction to radio came via Citizens Band AM in the late 70's. In the UK, if you knew which dark alley to be in, you could pick up a nice little black box which would make your 5 watt signal somewhat louder. The little black box was the only gateway to this cloak and dagger radio activity. No questions, no license, no names. :-)

Realizing the risk he was taking he soon inquired how to obtain a legal license. He was first licensed in 1983 as G6ZJA and upgraded to his Class A in February of 1985. Fifty one is a good age to apply yourself to a challenge like amateur radio you are able to afford the toys you couldn't get earlier when the house was full of kids.

Bob is also a collector of mechanical teleprinters, mostly Creed. He has 10 at this time, all working, and has a wide range of maintenance manuals and tuning forks as well. He feels if he lives until 2010 they may be worth a fortune, if not as a collector's thing, at least as scrap iron. :-)

Bob's station is based on an older Yaesu FT-102 rig with an FC-102 ATU and a FV-102DM external VFO. The rig has been modified to speed up the TX to RX recovery time for Amtor use. Bob's rig puts out 100 watts, maybe 120 with a following wind! He has never used an amplifier on HF.

Bob has one tower standing 60'. With a home-brew tri-band boomless quad for 10-15-20 meters. From the tower he hangs his full wave 40M quad loop and 80M Inverted Vee.

Terminal units- Home-brew MultyTerm controller designed by G4SKA for BARTG, RTTY, Amtor, Pactor, CW; home-brew R5 external SCAF audio filter designed by G3ISD for BARTG and a home-brew Baycom PC-Packet modem.

Computers—386-SX-40 and XT clone.

Software- Bob is a user of BMKMULTY software by Mike Kerry G4BMK. Bob hesitates to change until he finds the program in use is lacking a particular facility. So far the BMK has given him every option he could wish for, not only in his main mode RTTY, but also in Amtor and Pactor. Bob says it takes quite a while to get the best out of any software. Any change would only mean starting all over again with a consequent drop in performance. Providing the software offers all the options required, there is little difference between one or the other. The important ingredient is the operator and how skillful he is at getting the best out of the software in question. Even with BMK logging features Bob still likes to log by hand.

Bob enjoys taking part in all digital contests if not able to participate fully he tries to work a few stations for the fun of it. He also tries to increase his DXCC count towards 5BDXCC. Bob does Single/Op and Single/Band operations from his home station, except during the BARTG VHF RTTY contest. He then
travels 20 miles to Wales and operates from a 2,200 ft location on the Black Mixer hill in Radnor Forrest as GW0ARF/P.

Bob's favorite contests are: BARTG, ARRL RTTY Roundup, CQWW. He likes to CQ and hunt and pounce. He generally starts all contests establishing his presence on a frequency and calling CQ for as long as it produces results. When the rate drops he will go to search and pounce. The only tuning aid he uses is LED bars. Bob says he finds it entertaining when he gets a good run going and his TX frequency suddenly becomes a very popular place for other stations to start calling CQ. Bob says he doesn't waste much time trying to remind them of good operating practice, he just switches in the R5 filter and keeps on going.

Bob generally checks last year's logs for reference material for openings on other bands along with propagation charts. He has found many rare mults going just before the band is supposed to open. For low power stations that's important.

Contests success:
ANARTS'92 **1st WW** S/Op All Band
ANARTS'91 **2nd WW** S/Op All Band
Volta'93 **1st 7Mhz** Single/Band WW
Volta'92 &'91 **Top "G"** S/Op All Band
BARTG'94 **1st 3.5Mhz** Single/Band WW
ARRL RTTY Roundup'95 & '94 DX L.P. **2nd Europe**
ARRL RTTY Roundup'93 DX L.P. **1st Europe**
SARTG'94 & '93 **Top "G"** S/Op All Band
EA '93 & '91 **Top "G"** S/Op All Band
CQWW '91 & '90 **Top "G"** S/Op All Band
WAEDC '91 **Top "G"** S/Op All Band
BARTG VHF'94,'92,'91 **1st S/Op**
BARTG VHF'93 **1st M/Op**

Bob's most memorable win was ANARTS'92. The rules were published in Europe as weekend of June 6/7 and in North America as June 13/14. He started working the contest at 0000z on the 6th with the published rules in front of him. Ninety minutes into the contest Jim N2HOS called him to say he was one week early as the result of an administrative foul up. Bob was all fired up ready to hit the contest with full force. All he got out of it was spending the next couple of hours trying to unwind enough to go to bed..

When the following weekend arrived he was fired up to get even with the administrator. It seemed to have done the trick. He won the contest with 1,855,234 points over the second place's

931,720 score. The previous year he lost first place to Tapani OH2LU by a mere one QSO and vowed he wouldn't let that happen again. The winning margin came as a great shock to him, so perhaps he should get angry a little more often!!!

I would like to think Bob for his help in preparing this article. Next month we will visit with Jan SM5FUG in Sweden.

The next three contests:

Contest	Dates	Start Time	End Time	Operating Time
WAEDC	Nov 11-12	1200 UTC Sat	2400 UTC Sun	30 of 36 hrs.
Sprint	Dec 9-10	2100 UTC Sat	0100 UTC Sun	No Off times
Roundup	Jan 6-7	1800 UTC Sat	2400 UTC Sun	24 of 30 hrs.

Until next time,

73's, de Ron AB5KD

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

(Footnote from the editor—read more about G0ARF in the International Scene section of this issue of the Digital Journal).

(Cont'd from page 17)

FINAL SCORE: Total QSOs x total multipliers.

AWARDS: To top stations in each class, country, and district mentioned above.

LOGS: Use separate logsheets for each mode. Logsheets must contain: Date, Mode, Time UTC, Callsign, message sent/received, first-time multiplier prefix, and QSO points. Also required is a Summary sheet with a list of claimed multipliers. Comments are very much appreciated.

DEADLINES: All logs must be postmarked within 4 weeks of the Contest. Mail to:

Werner LUDWIG, DF5BX
P.O. Box 12 70
D—49110 Georgsmarienhutte
GERMANY

WAE country list as of 1 MAR 94, (72 countries):

1A0	C3	ER	GJ	HB0	LA	OJ0	R1/fjl	SV	TF
3A	CT	ES	GM	HV	LX	OK	R1/mvi	SV5	TK
4J1	CU	EU	GM/sh	I	LY	OM	RA/eu	SV9	UR
4U/ITU	DL	F	GU	IS	LZ	ON	RA2	SY	YL
4U/VIC	EA	G	GW	IT	OE	OY	S5	T7	YO
9A	EA6	GD	HA	JW/bear	OH	OZ	SM	T9	YU
9H	EI	GI	HB	JW/mayen	OH0	PA	SP	TA1	Z3
									ZA
									ZB

COMMENTS: The following major changes were made in February '95:

Multi-op class deleted.
Exchange is now RST + QSO nr. (name and state deleted)
Mode change for additional QSO now allowed immediately after first mode QSO.
USA states do NOT count as mults - only call districts.
VK districts no longer count as mults.

This is a 6-hour all-digital (no Packet) WW 10M contest. It occurs on Sundays, 4 times a year. Count multipliers for each country worked on DXCC/WAE country list, and for each JA, VE, and W call areas. This means that your FIRST JA, VE, and W QSO in the contest will also count for a DXCC/WAE country mult.

— — Band-hopping in the Contests — —

The most challenging part of contesting, in any mode, is finding more and more multipliers. But finding mults is not the highest priority at the start. What is needed most in the beginning is making contacts, on any band, and at a reasonable pace. If the propagation forecast says that the Maximum Useable Frequency (MUF) at your QTH is going to be 22 MHz that day does not necessarily mean that Mother Nature is going to smile at you on 15 Meters just because you're a good guy! That MUF prediction is based on best scientific estimates made weeks in advance. Besides, there are other factors, such as: high absorption (A index), or a solar flare, or the band is not open at your QTH because of the particular time of day at your QTH.

When a contest starts at 0000 UTC, the band choice will be based on your QTH. If you live in England, that's midnight. Best band would be 40M, or 20M looking west. If you live in Japan, that's 9 AM. Best band would be 20 or 15M, looking easterly. East coast USA it's 7 PM. Best is 20M to the west and south, and 40M into the evening. West coast USA it's 4 PM PST. 15M should be hot for JA's looking to USA for high QSO rates, and 20M for Central and S. America.

Another factor is when to sleep. Most human beings sleep at night, and a few can operate all night. But how long to sleep is another story. I remember talking to one of the truly great contesters, Nose, KH6IJ at Visalia DX Convention some years back. I asked him when he slept during contests because I kept hearing him at all hours of the day and night. He told me that he would sleep in 15 to 30 minute increments, and at random times. He said he developed a knack of being able go to sleep and wake up at will! Amazing!

As we all know, the MUF drops as the sun sets. One has to remember that the MUF pertains to the reflective layer of the atmosphere at the point of reflections. So, the lower your take-off angle, the later the band goes dead in the evening. That's why we can still work DX on 15 and 10M to the west when it gets dark at our own QTH. Of course, the opposite direction occurs at dawn. The closer you work to the MUF, the better the propagation will be for you. Also, there's the greyline. Working DX on the greyline, that path that follows the sunrise-sunset, is an interesting propagation mode. It doesn't last long, maybe 30-45 minutes. One can pick up some really long haul DX if you're fortunate enough to find DX stations along its path. In the early 1980's I used "**The DX Edge**," a clever plastic sliding graph that would show the night-and-day coverage of the earth for each month of the year. It shows the greyline quite clearly. Then came "**Terminator**," a shareware computer program that did the same thing automatically. It also shows where the sun is at that moment. I use Terminator as a TSR for most of the contests.

Second Rule of Thumb: Stay close to MUF predictions for best propagation during daylight hours. At night 40M will be the main stream, with occasional checking of 20 - westerly after sunset, and easterly before dawn. Exception: As dawn moves across europe it becomes the most active time for european mults, regardless of MUF.

Third Rule of Thumb: When you have more than 5 minutes between QSOs, quickly scan other not-so-active bands for mults. Try a CQ or two to pick up a stray, but always keep in mind you're not on the band with the most activity.

Fourth Rule of Thumb: Try to divide your sleep between 4 hours late-night and 4 hours around noon, your time. That's when activity is minimum in your area.

Fifth Rule of Thumb: After dark check 80M activity at the top of each hour.

Reminder: *First Rule of Thumb:* Keep thumb out of mouth!

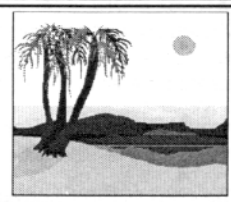
73, See you in the pileups,
Rich, N6GG

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!

Digital DXing

Planning your own RTTY DXpedition (Part 2)

by Glenn Vinson, W6OTC
#2 Embarcadero Center, #1660 • San Francisco, CA 94111



I believe a good beam is essential for frequencies above 14 MHz on almost any undertaking. If your DXpedition will be single-mode, a trap antenna, such as the Cushcraft A3 works fine and will not require a tuner. Be sure to take extra screws and clamps of various sizes; they are easy to lose and sometimes break. If you intend to work multi-mode, a trapless antenna, such as the Force 12 C3 (20 meters to 10 meters, including, with a tuner, 17 meters) or C4 (covering 40 meters to 10 meters, including, with a tuner, the WARC bands) will work better because it is inherently broad-banded. If you are going to a location without direct air connections from the U. S., watch out for the box length of beams. Many tribanders are packaged in 84-inch boxes, while the limit for checked baggage is 80 inches. I have not had problems with the 84-inch length on direct international flights originating in the U. S., but for other destinations that require a change of planes outside of the U. S., you may have to resort to airfreight. Very often, particularly in the Pacific, non-US airlines will be accommodating on the way out, but very tough on excess weight or size on the way back to the U. S. In those cases, I have found it cheaper to abandon the antennas (or give them to a local ham or club) than to bring them back—a choice you would not want to make with your KW amp. A different solution to the box-length problem is to buy a DXpedition-size antenna from Force 12. Virtually any of their antennas can be ordered to be made to fit in a 48 inch box, are readily checkable as baggage and do not weigh appreciably more than regular size models.

How will you support the beam? A good question. Solutions I have used: find a suitable (say 3" by 20') piece of pipe locally (beware of the time required to locate any item of any sort locally); ship a Radio Shack push-up mast (these are much too long to check as luggage); take a smaller, aluminum army-surplus push-up mast that weighs 24 pounds and is checkable—but be careful to push it up with the antenna mounted, rather than trying to hoist it horizontally while fully extended. Another alternative I have seen advertised is a compact portable mast made by New Wave Antenna in Englewood, CO. I do not have any reports of field performance. Don't forget to take a roll (500 feet—it disappears fast) of lightweight nylon or similar small-dimension rope to guy the mast.

How will you turn the antenna? Another good question. For most DXpeditions, rotators are not worthwhile because of their weight and the difficulty of mounting them effectively on the end of the available mast. In addition, a DXpedition usually has no need to turn a beam remotely or quickly. Pushup masts have slip rings for the guys and can be turned by hand on the ground. Other masts need to be affixed to something stout with U-bolts which can be loosened to permit turning the mast by hand or by tugging on a tag line attached to the antenna's boom. If you anticipate using this method, be certain to take extra U-bolts. They may not be obtainable locally. Often, antenna placement and erection on a DXpedition will test your ingenuity, but my experiences tell me to take a beam if at all possible; use a vertical or wire only as a last resort. Nevertheless, take enough solid (not stranded—you don't want to waste time unknotting kinks) wire (I take 500'), insulators and a balun (and perhaps an antenna tuner, depending on whether your rig has an adequate built-in tuner) to erect a wire antenna, such as a G5RV or a longwire, for 80 meters or when and if all else fails.

If you will be operating from a multistory building and do take an external tuner, you might also take 100' of twinlead to provide the option of a delta loop. An 80-meter full-wave delta loop will work on all bands through 10 meters with a tuner that can handle the twinlead output. When a vertical is the best solution for your location, remember to take spare screws and clamps.

Whatever combination of antenna and mast you decide to use, beams and masts should be assembled and erected first at home. The time saved and mistakes avoided when you arrive at your DX location make this exercise well worth the time and trouble. If the antenna is one that requires measurement, such as the A3, the proper lengths should be clearly marked for speeding reassembly. Also, if you are taking a lightweight mast, you need to verify that it will be adequate to hold up the antenna for the duration of the trip.

Some Other Required Items.

1. You must, of course, take coax. Since weight is at a premium, I recommend, even for KW operations, RG8X or, better, LMR240. Dielectric breakdown will not likely be a problem with high power for the short duration of the DXpedition. Generally, I leave the coax behind and use the saved weight for something else (like checking some of the carry-on luggage) for the trip home. Unless you know the local conditions very well, take more coax than you think you will need. Cut the coax into lengths of 100 feet and fit the PL259 connectors before the trip. You will have better things to do than solder these connectors in the field. You should also have several 3' and 5' lengths of coax with connectors attached to facilitate interconnecting the station. Of course take spare PL259s and lots of double female (for connecting coax lengths) and double male (for directly mounting bandpass and lowpass filters to the transceiver and/or amplifier) connectors. Think about how your station(s) will be laid out.

2. Try to determine in advance the AC plug types that are required locally and obtain, if possible, either plug converters or the plugs themselves for fitting on your gear or plug strips (discussed below). You will usually want to avoid having to make a direct hot connection to the wires in the wall. But you will want to verify what voltage is present so take a small multimeter. Likewise, take a set of spare fuses for all fused gear.

3. Miscellaneous tools, including flashlight (and spare batteries), screwdrivers, pliers, sidecutters, an adjustable wrench, nutdrivers or ratchet set, several roles of electrical tape and general-purpose tough ("300 mph") tape, extra batteries, compass, knife, a butane soldering pencil (and extra can of butane) or a soldering gun, 100' tape measure (for measuring a wire antenna), small drill and perhaps other items, depending on the circumstances. A comprehensive list will vary somewhat on each DXpedition and my main point is to think very carefully, in advance, about what tools you will need. These tools may well be unavailable at your operating site and be critical in making the DXpedition work.

4. A laptop computer with WF1B RTTY software loaded and tested with your TNC and rig, a spare software diskette, 2 sets of cables, spare diskettes (I take a box of 10) for log backups during the trip and finally, but very importantly, 2 TNCs. In addition, if you have one available, take a DSP unit to help deal with

local noise and big pileups. Those using the PK-232 may also want to modify it as described by modem engineer, Garry Shapiro, NI6T, in his article, "Optimizing the PK-232MBX for RTTY and AMTOR," Communications Quarterly, Winter 1993 at pages 83-91. Garry modified a unit for our use in YK (adding a few more refinements from his recent experience) and it performed extremely well. If two or more persons are going on the DXpedition, try to bring at least two laptop computers. In no other area is redundancy as important as with the computer gear, TNCs and software. My computer worked flawlessly at home for weeks before going to 8R but was DOA when I tried to fire up the rig in Guyana. Fortunately, G0AZT had a spare and the trip was saved.

5. Power for the TNC and other small devices. Some users of the FT-990 take 12 volts from the rear panel to power the TNC. Yaesu recommends against this practice where the current draw is as high as 1 amp (as it is with the PK-232). I take a small power supply, either a 110v or 220v AC version and with 12v DC out to power the TNC. Any of the smaller Astron power supplies can be ordered in 220v versions or you may have spare power available if you are using an external 13.8v supply to power your transceiver. If I am going to a 220v site and taking a battery powered screwdriver or drill, I add a small 220v/110v stepdown transformer for charging the battery.

6. Two or three muffin fans for cooling the amp and transceiver. AC fans are quieter electrically than DC fans, and can be obtained for 110v or 220v. For the serious RTTY work of a DXpedition, these fans make a big difference in keeping the rigs and external power supplies cool, especially if you are working from a tropical area.

7. Multi-outlet AC power strip or box. For low power needs, such as muffin fans, battery charger, laptop computer or 12v power supply, a standard and cheap 110v power strip (like the sort sold in computer stores) is very handy for providing extra outlets. I have also used these 110v strips with 220v line voltage by hardwiring a bypass of the strip's surge protection circuit, snipping out the varister. This modification allows you to plug in your low wattage dual-voltage items without changing their plugs or requiring more 110v/220v plug adapters. If you need a high power multi-outlet box, one can be constructed from parts available at electrical supply houses. I have several with 4 outlets each, constructed by Steve Stark, KE6FV, for the YK trip. The great advantage to such a box is that it allows you to use the standard US 110v or 220v plugs already on your equipment, while providing a single pigtail to which the required local male plug can be connected for the wall outlet or generator.

Some Optional Items.

1. Antenna tuner. On DXpeditions to locations where some power is allowed, I use an IC-2KL solid state amplifier which is not tolerant of high SWR or low line voltage. For SWR protection, I take an external tuner "just in case" there is a problem with the antenna match or in case a wire antenna must be used (although a well-measured and -erected G5RV often works FB within the narrow RTTY range without a tuner). The low line voltage problem has no good solution and, by all reports, occurred on the BV9P DXpedition which was trying to use a Yaesu FL7000 in such conditions. The result was low power output (300 watts) because if driven to full power at low line voltage the solid state devices will draw excessive current, overheat and fairly quickly fail.

2. I take an SWR analyzer for the same fail-safe reason. Whether you have an MFJ, Autec or the AEA HF Analyst, it can be invaluable in identifying and fixing antenna problems quickly.

3. Grounding, RFI and TVI gear. Since conventional grounding is problematic or non-existent on DXpeditions, many operators simply run a heavy gauge wire loop between all transceivers, amplifiers and whatever else can be connected. Ferrite beads are very useful in trying to minimize interference to computers or TNCs, especially when using amplifiers. If broadcast TV is present, a low pass filter between the transceiver and the amplifier plus another after the amplifier will usually be much appreciated by the local residents. Finally, if multiple rigs are being used, be sure to have a set of band pass filters for each rig and to use them at all times.

Operating Tips.

Program your macros before leaving home. Remember that the stations calling you want to see their calls print on their screen. Therefore, consider responding to their calls with the following: "<his call><his call> de <your call> 599 <his call> qsl? kn". My experience is that the DX station should give its call once virtually every time that it transmits, specify where it is listening after positively sending a QSL to a specified station worked, and move briskly through a pileup. Problems with calling stations generally develop as a result of their frustration and fear of not working the DX station. If you are operating predictably whenever the bands are open to the U. S., Japan or Europe, tell the listeners what you are doing (e.g. QSX up 2) and always follow your own rules, the callers, no matter what their nationality, call district or hair color, will be amazingly well-behaved.

Final Practical Tips.

Be realistic about what you can and/or want to accomplish. Putting up five antennas can be done, but do you want to spend four days working on that project and only three days operating? Because your time as DX is limited, advance thought, planning and testing cannot be overemphasized. Unexpected problems will almost always occur, and you do want to have some fun. If boat transportation is required to reach your final destination, be certain the boat is booked in advance and that the cost is clearly established. Remember the limitations that weight and length restrictions impose on airline checked baggage and maximize what you carry on the plane. Balancing all of these competing interests is very difficult except for the most flush operations. However, having 2 or 3 (or more) participants is obviously very helpful in transporting all the gear you need to even the most civilized of DX sites. In that case, think about having a variety of talents: engineering, mechanical, operating, general personal relations. You will be together in a stressful situation that requires much mutual cooperation and imagination to handle effectively. While good operators are needed, there is little or no room for prima donnas or "difficult" personalities on successful operations. The unexpected will present all the challenges that the participants will want to deal with.

Finally, get your QSLs printed in advance if possible, but in any event spend the time to answer all requests promptly. The DXpedition is not over when you get home. It is over only when you have completed your QSOs by sending QSLs to those who want the confirmation of having worked you from your DX location. The process of QSLing promptly is critical to the completion of a successful DXpedition, and is greatly aided on RTTY by the fact that in almost all cases a computer log (with the ability to generate labels) will be created as a matter of course.

For myself, I have found nothing in amateur radio that I enjoy more than DXpeditioning. I look forward to working all of you on my future trips—starting with VK9LZ—and to working you on your own trips.

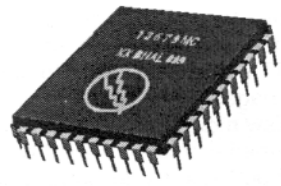
++++++

This concludes this portion of the Dxpedition story. But Glenn is now enroute to Hord Howe and will soon be operating from that remote piece of real estate. Be certain to work them before, during or after the CQWW RTTY contest. Subsequent articles will bring the entire Lord Howe story to Journal readers. Stay tuned! Ed.

8-bits, 16-bits, 32-bits a Dollar??

Part One

by Steve Holton, N2QCA
1113 Sunset Street • Yorktown Heights, N.Y. 10598 / Internet: slapshot@westnet.com



With IBM's Warp growing in popularity as it approaches it's first birthday, and with Windows 95 now out on the streets, the interest and hype about 32-bit systems will only increase. The intent of this article is to provide some basic information that, hopefully, will enable you to make at least some sense out of all the "information" that's being bandied about. For the computer wizards out there, this article is probably not for you - it's for the "mere mortals" amongst us who want to know more about this confusing area. I'll also try and introduce many of the terms that you'll be hearing tossed around more and more. It's often hard to sort fact from fiction when even some company's technical literature is less than forthright about important technical areas of their products. Some of the confusion stems from the use of the term 32-bit to mean/imply different things—even within a single document! The frequent desire for new software to operate on both old and new platforms, as well as to provide compatibility with older existing software really confuses the issue.

I'll start this article by reviewing the evolution of the PC hardware, as this is much clearer than the evolution of the software. I'll touch only briefly on the software aspects now and next month we will take a closer look at the software side of the equation and see how it really muddies up the water. Hopefully, however, we'll be able to end up at a point where you will have some idea of what's important in this mess!

PC Hardware - the Beginning

The initial IBM PC used the Intel 8088 microprocessor. It's the microprocessor that really determines the "bitness" of a system. The internal structure of the 8088 processor was 16-bits wide. Data could be moved about in 16-bit chunks, called words, and could be held inside the processor in 16-bit registers. The processor was also capable of doing arithmetic with 16 quantities. Finally, the processor used it's 16-bit registers and arithmetic capabilities to form memory addresses to access programs and data. Something may be nagging the back of the brain—wasn't there something about 8-bits and memory access in the Intel 8088 processor? Indeed there was because the last 8 in the name 8088 meant that the processor's bus, used to communicate to the outside was only 8-bits wide. This reduced the cost of peripheral I/O devices on the bus and the supporting logic to access the memory on the bus. Everything inside the processor chip was truly 16-bit, and the program/programmer wasn't aware of this 8-bit wide bus. It just meant that to bring a 16-bit word in from memory required two 8-bit bus cycles. Intel also produced a 8086 processor which had a true 16-bit bus which was used in some PCs for improved performance.

Let's pause for a moment and think about a number with 16-bits. In 16-bits you can represent numbers from 0 to 65535 or from +32767 to -32768. What a minute you say, I know that ol' original PC could handle bigger numbers than that, and it was also capable of addressing more memory than 64KB of memory. We'll examine each of these points in turn. If you ignore floating point numbers and math co-processors, the 8088 could only perform arithmetic 16-bits at a time. To add two 32-bit numbers it had to do two additions, one for the bottom 16-bits of each number and a second addition for the upper 16-bits of each number. Special machine instructions were available to handle any carries that might occur between each of the additions. So the addition of 32 bits numbers was twice as slow as 16-bit numbers. Multiplication of 32-bit numbers required 4 discrete multiplications and some additions, so it was at least 4 times as slow as 16-bit multiplication.

So what's the story about memory addressing? The predecessor to the 8088 was the 8080 microprocessor. It also had 16-bit capability on the chip, but it was in fact, limited to accessing only a total of 64KB of memory. When the 8088/8086 appeared it was obvious that more than 64KB of memory was going to be required, but at the same time it was also recognized that making the entire processor structure larger (say 24 or 32-bits) was going to be much too costly in the technology of the day. The solution was to introduce some new 16-bit registers called segment registers. These segment registers contained memory addresses in units of 16 bytes and were combined with regular 16-bit registers containing addresses in units of bytes, which were referred to as offsets. This combination yielded 20 bit addresses that were sent out on the memory bus. 20 bits allows up to 1MB of memory to be addressed. This is derivation of the familiar basic DOS limitation of 1MB of regular memory.

This compromise on the memory addressing architecture had some significant consequences, particularly on programmers. Without going into all the gory details, the basic problem can be recognized fairly easily. It takes two registers to form a memory address - the segment register and an ordinary register with a byte offset. This was called segment:offset addressing or in the jargon of some 16:16 addressing - as the segment and offset were each 16-bits. What this meant was, that having placed a starting address in a segment register, you could now access 64K bytes worth of data or program without having to change the segment register. But, it also meant if you needed to access one byte beyond the last byte in the 64K range you had to now change two registers - the segment and offset registers. This became a nightmare once either a program or it's data exceeded 64KB in size. Now one form of addressing manipulation was used for data or routines that were within 64K, while another form was needed to reach farther than that. If you've heard the terms near and far calls or near and far data - this is what it is referring to. Near things are within a 64K block while far things are not. Programming got very complicated and also inefficient when things grew beyond 64K in size - having to manipulate 2 registers for a memory access certainly didn't makes programs run faster, and had even greater negative performance implications in the next generation of Intel processors.

PC Hardware - the PC/AT

The next generation of PC arrived in 1984 with the IBM PC/AT which used the Intel 80286 microprocessor. The 80286 was also a 16-bit processor—it moved data around in units of 16-bits and did it's arithmetic on 16-bit quantities.

This doesn't sound much different that original PC—so what's different? For starters, the 80286 was faster. The increased performance came from both cranking up the clock speed to do things faster, and it also was smarter with more transistors it could do more things at once getting more work done in each faster cycle. In addition it only came with a 16-bit bus to memory and I/O adapter cards which sped things up as well. When an 80286 machine was powered on, it ran just like an 8088/8086 except faster. It had the same machine instructions, the same 16-bit segment:offset addressing with the same 1MB memory capacity limitation. But there was another difference—the 80286 had a new mode of operation called 'protect mode.' The old mode that the 80286 inherited from it's predecessors now had to have a name - it was called real mode. So the original PC and the PC/AT, in the manner most people used it, ran in real mode. Real mode operation was the heart of DOS. The difference between the two lies in what the processor does to provide an operating system to protect itself from injury due to errant applications and isolate one application from another's mischief. New facilities that make it easy to run more than one application at once were added as well. DOS ran in real mode and was vulnerable to any misbehaving applications. It could run multiple applications but only through TSRs which suffered from instabilities and harmful interactions. Enough software for the moment let's return to the hardware and consider protect mode as arrived in the PC/AT.

There are two basic capabilities needed to build a reliable system. The first is to have at least two operating modes for the CPU. One mode which allows all the different instructions to be executed is called the supervisor or privileged mode. The other mode is often called user mode and allows only a subset of the processor's instructions to be executed. The user mode subset is contains only the "safe" instructions which prevent an application running in user mode from crashing the operating system which runs in supervisor mode. The second major feature is some form of memory protection. This isolates the programs and data of the operating system from applications, and multiple applications from each other as well. It also makes the memory occupied by programs read-only so that they can't be clobbered by programming errors. Instructions and special data tables needed to achieve this are only accessible by programs running in supervisor state. With a properly designed set of facilities like this, it is possible to build a bulletproof operating system in theory. In practice, good operating systems come very close to achieving this. These ideas are not at all new, they've been around for well over 30 years in mainframe systems and in later systems like Unix.

The 80286 chip had not two but four different levels of privilege. In Intel terminology the most trusted level was called privilege level 0 or ring 0, the least trusted level 3 or ring 3. I know of no system that used all four levels. The chip also had memory protection which it implemented by defining tables that the trusted operating system could construct and the processor would examine to make sure that a program was allowed to access a particular area of memory. Again in Intel terminology these tables were called the Global Descriptor Table (GDT) and local Descriptor Table (LDT). In protect mode the segment registers no longer contained memory addresses, but were keys that the processor used to look in a descriptor table to determine where the segment was actually located and whether access was allowed to that segment based on the privilege level of the machine at the moment. The details get rather messy, but a few points are important. One is that segments were still limited to a maximum of 64KB and the complexity of writing large programs or using large data structures were as bad, if not worse, as in real mode. Secondly, every time a new segment selector was loaded into a segment register it cost 19 clock cycles versus 2-6 clock cycles for ordinary instructions which had a negative performance impact. One very important plus of running in protect mode was the fact that the 80286 could address up to 16MB of memory while in protect mode.

The exploitation of protect mode was hampered by a number of factors. One was the fact that the chip had a number of flaws in it's protect mode operation which took several iterations to fix or work around. You thought the Pentium was the first? First only in keeping the problem under wraps—the 80286, 80386, and 80386 all had various problems, but this was made known to developers and workaround/fixes developed. The other problem was the fact that you could switch from real mode into protect mode, there was no way built into the chip to switch back. Some slow & ugly hacks were devised to do it. This was needed, for example, by DOS to switch into protect mode to access memory above 1MB as a RAM disk and copy the data to low memory and return back to a DOS program running in real mode. The same problem hampered OS/2 Version 1 which was designed for 80286 protect mode but needed to be able to run old DOS programs as well. A further problem was that while running in real mode - that is running regular DOS or trying to run old DOS programs from OS/2 Version 1 - you had no protection and an errant DOS program still crashed the system. Xenix (a Unix variant) and early Windows also tried to exploit 80286 protect mode as well. None were particularly successful. Why have we spent so much time on all this if the 80286 was not particularly successful except as a much faster real mode DOS machine? We have defined some of the basic underpinnings required by a modern operating system and now we'll see how the serious drawbacks of the 80286 were overcome in the 80386.

PC Hardware - the 32-bit Age Arrives

The introduction of the 80386 in 1986 was a huge step forward. How significant wasn't totally apparent at that time for several reason. One was the fact that the attempts to exploit the 80286 were still being developed. Further the expectation, based on the 80286 experience, was that it would take a good while to get the bugs out of the new chip. The reality was the 80386 came up to snuff very rapidly and the weaknesses in the 80286 were under appreciated. There's been a lot of catching up by the software to properly exploit the 80386, and it continues even today. Let's look at the actual chip itself.

To start with the 80386 was, just like the 80286, a very fast 8088/8086 perfectly capable of running your favorite old DOS & DOS programs in real mode without change. Again it got this performance boost both by offering raw clock speed (16 & 20 Mhz compared to the original 4.88MHz PC) and working smarter by doing more in each clock cycle. But here were some key differences compared to the 80286. The processor had 32-bit wide data paths and registers. It was capable of doing arithmetic directly on 32-bit quantities. It also had a 32bit wide bus to memory so it could fetch more data with each memory access (as with the 8088 there were cost reduced SX models with only a 16-bit external data path, but were a true 32bit processor on chip). So the 80386 had the potential for improved performance due it's 32-bit capabilities. While these could be used in real mode under DOS in assembler code it wasn't a very practical proposition. In protect mode, however, it was the now the natural way to do things. Further, 32-bit registers could now span 32-bits worth of memory addresses—that's 4GB (yes Gigabytes). All the ugliness of small 64KB segments could be made to vanish when running in protect mode on the

80386. For compatibility with the 80286 it could also run old 16-bit protect mode code from the 80286 as well. Thus the 80386 was a much very faster PC (8088) and faster PC/AT(80286) and a new 32-bit 80386 all wrapped up in one microprocessor chip.

The 80386 also overcame several other weaknesses of the 80286. For one, it could switch back and forth between real and protect mode via standard instruction sequences. the 80386 also introduced virtual memory and paging to the Intel microprocessor world. This allowed an operating system to present the illusion of having more memory than it actually did. This is accomplished by dividing memory into 4096 byte chunks called pages and keeping the actively used ones in memory and the inactive ones on disk. The processor has tables maintained by the system that keep track of which pages are in memory and where they are and which ones are out on disk. When a page is referenced that is not in memory the processor notifies the system which brings in the needed page, swapping out an inactive one if necessary to make room for the inbound page. This capability is important in it's own right and also made possible one of the most important features of the 80386—the ability to run old DOS and DOS programs alongside new 32-bit programs in a reliable protect mode environment. This Virtual 8086 mode (commonly shortened to V86 mode) allowed the creation of a 1MB virtual 8086 machine environment within the full 80386 protect mode operating environment. Inside that virtual 8086 machine everything appeared to run just like an old real mode 8086 PC. Because this machine was running in a protect mode environment the programs running in the virtual machine couldn't harm anything outside of it. Secondly you could have more than one of these V86 machines running concurrently each, protected from each other by the memory protection facilities of the 80386. This may sound a lot like blue smoke and mirrors, but it is very real and very important to much of what software developers did to exploit the 80386.

PC Hardware - the 486 and Pentium

Surprise! The 80486 and Pentium add little to this story. It is true that both chip families offered dramatic performance improvements. Again, each offered ever increasing clock speeds and smarter and smarter use of each clock cycle. This reached it's highest state so far with the Pentium which tries to execute two complete instructions every clock cycle. But if you focus on the basic functional capabilities of these new chips (32-bit arithmetic, memory addressing, protect mode, Virtual 8086 mode and paging) all were first introduced by the 80386. The 486 and Pentium were major technical accomplishments, but in terms of function they merely added tweaks to the 80386. Software development didn't catch up with the 80386's function until the 486 was well on the scene. To some degree the horsepower of these latest chips was now needed to exploit the capabilities of today's software.

PC Hardware - Summary

As we've seen there has been a dramatic and continuous evolution of the microprocessors available to PC manufacturers since the introduction of the IBM PC in August 1981. The most obvious element has been raw performance. From the 4.88 Mhz 8088 chip in the original PC to 133MHz Pentiums, the performance improvements were dramatic. Equally dramatic, however, was the obvious fact that the systems as a whole failed to realize the same performance gains. This was due to the fact that other components of the system could not achieve proportionally the same gains as the microprocessor. Disk drives have improved dramatically in capacity and cost but only modestly in raw speed. Memory has also seen vast increases in capacity and plummeting costs but little change in speed. Attempts to overcome the mismatch between processor and memory speeds began with adding external memory caches to 80386 systems and continued with the internal caches of the 80486 and Pentium. While some of the details of cache operation are quite complex, the basic principles are relatively easy to grasp.

A cache is all about trying to place a small amount of fast memory between the processor and it's conventional, rather slow DRAM memory and having the bulk of the processor's memory access satisfied from the fast cache memory. The cache memory is faster, typically expensive SRAM and is located close to or directly on the microprocessor chip. If you can keep the most frequently used parts of memory in the cache, you are running at it's faster memory speed as long as the instructions or data you need are in the cache. This juggling, keeping the most active areas of memory in fast memory and writing out less frequently used parts to slower memory, is all done by hardware. If you had a small program loop which operated on a small amount of data, it might all fit in the cache and you could do all your computations from cache memory. What's not so obvious, but has been well known since caches appeared in the '60s, is the fact that typical programs do behave in much the same way. They tend to have quite localized usage of memory that makes them run close (80-95%) of the speed of the fast cache memory. Some of this comes about because the hardware loads the cache with more than the processor's request, anticipating that it will soon want the bytes surrounding the initial request. What can be done once, can be done twice - many 486 and Pentium systems have a 3 level hierarchy of memory. The level 1 cache is on the microprocessor chip itself, with a level 2 cache just off the chip, and then the normal DRAM at the lowest level. Disk drives/controllers now commonly come with cache memories to hold recently accessed data

So they've done all these things to speed up my total system, it still doesn't seem to run anywhere near as fast as the speeds of the components appear to be able to run. What's happened? Most of it can be explained by software, and we'll explore that in more detail in our next installment. But in simple terms. it is often simply the software developers exhibiting a variant of Parkinson's Law. Much of it is the incredible cost in memory and computation to produce the complex Graphical User Interfaces (GUIs) we now see in Windows, Warp etc. And yes, some of it comes from exploiting the functions that have evolved in the Intel chips families. It is not meaningful to think in terms of 32-bits being twice as good/fast/large as 16-bits, for there is a definite price to taking full measure of the chip's capability. When people talk about 32-bits the thing foremost in their minds is the ability to directly access all of the memory. The advantages of using 32-bit protect mode to improve system reliability is often secondary, but becoming more appreciated recently, as is the potential to perform multiple tasks concurrently. One of the things that will surprise you in our next installment is how much 32-bit capability has crept into both DOS and Windows over the last 5 years. So much so that all the hoopla about Windows 95 being *all new* is just that—hoopla! This is actually very good news, as you never, ever, really want an *all new* operating system. The fact that both Windows 95 and OS/2 Warp are actually very significant *evolutionary* releases on a stable and mature base is good news to end users.

See you next month . . . de Steve N2QCA.

SARTG '95

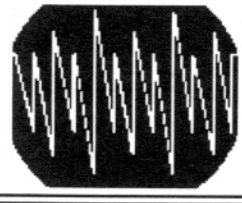
HIGH CLAIMED SCORES

Call	QSO's	Pts	Dist	DX	Score	Catagory
K1IU	481	6070	57	81	837660	S/O All Band
AB5KD	586	5925	60	61	728775	M/O
AA5AU	483	5355	59	71	696150	S/O " "
OH2GI	370	4270	25	101	534240	S/O " "
WA4VQD	404	4425	47	63	486750	M/O
PI4CC	334	3880	26	89	446200	M/O
OH3MMF	323	3705	21	96	433485	S/O All Band
NO2T	378	3570	45	75	428400	S/O " "
N2DL	???	????	??	??	427705	S/O " "
KP2N	442	5290	24	44	395010	20M S/B
WF1B	251	2880	45	52	279360	S/O All Band
N0AB	281	2945	29	43	241490	S/O " "
WA4ZXA	236	2605	42	43	221425	S/O " "
KE7GH	307	3025	42	27	199650	S/O " "
NA4M/5	239	2540	41	36	195580	S/O " "
NA2M	???	????	??	??	141780	S/O " "
VE6KRR	207	2195	31	26	125115	S/O " "
N4ON	175	1910	28	35	120330	S/O " "
KF3P	132	1490	31	30	90890	S/O " "
OH2LU	140	1445	8	47	79475	S/O " "
N1JM	95	1070	20	21	43870	S/O " "
WA6SDM	83	830	22	10	26560	S/O " "
N2FF	??	???	??	??	18340	S/O " "
K8DO	76	755	10	4	10571	S/O " "

Jay Says . . .

Comments & Perspective from around the Digital Frontier

By Jay Townsend, WS7I • P.O. Box 644 • Spokane, WA 99210-0644
Internet: jayt@comtch.iea.com



I must admit that I am getting a mite discouraged...finally found the strange fellows on 14.088.5 to 14.091.8 or thereabouts. Who can tell just where? 1200 baud packet complete with non-identifying frequency cops...amid threats of calls to the FCC, (ouch, that one hurt!). I had a couple of QSO's, changed frequency's three times by over 500 Hz each time and finally moved up a little with XE1MN and had a nice QSO, and even completed my schedule with Ted, HC5K who promises to be on more often these days.

This month arrived amid a flurry of activity. I made a bunch of phone calls, and found out some interesting things in the last couple of weeks. First of all the HAL Communications new and vastly improved as promised filters for both the P38 and the PCI-4000 are out and available. Received word from our friends at AEA in Seattle that Pactor II plans continue and the rumor to the contrary, according to my source is not accurate. I received the new EPROM's from Kantronics for my KPC 9612 which will be the major piece of this months perspective from the Digital Frontier.

Let's get right into the mailbag and mention a few names of those who are starting to drop me a line. Bill, W7LZP, who has been searching for some tuning help on his KAM after hearing about all the tuning indicator chatter here in the Digital Journal. After making the changes (the factory manual shows you how!) he says that the scope beats the LED bar graph hands down. He goes on to say that it was simple and easy and it works like a charm, but he was quick to note that there wasn't anything wrong with the LED's as they do their job as designed.

Bill also mentioned that he had also learned something about the MARK and SPACE commands for the KAM that he would like to share. After changing to narrow filters (250 Hz) the tuning was slightly off-center in his Kenwood 850 (a popular RTTY rig). When he had a signal centered in the passband of the '850, the LED bar graph on the KAM was off to one side. Not much — maybe about 40 Hz or so, just enough to notice and make him want to fix it. Bill relates that the passband CAN be moved in the KAM by using the MARK and SPACE commands, but only (and here's the catch) if you use the HOSTSET.EXE program to change the default shift setting to MODEM. (Using Hostmaster II) If you leave the default shift set to 170 Hz — what you'd expect — the MARK and SPACE commands only take effect while you remain in the RTTY mode. You HAVE to use HOSTSET.EXE to change the default shift setting to MODEM. I use a different method on my KAM. I change the tones not the shift to match the filters of my 850 or FT-1000.

JE2UFF writes that he is looking for some 88 mH chokes. In his case for his ST-6, but others probably for tuning indicators. I hope to have word soon about a supply that the IDRA software store will be able to send out.

New Contest rule clarification's are out for all of the CQWW contests except RTTY, which I suspect will be forthcoming. They changed the rules to make iron clad the "one signal on the air at a time" rule. Also for M/S the 10 minute rule has been clarified. The 10 minutes now begins with the first QSO on the new band. Hopefully Roy and Ron will follow suit and adopt both of these small but excellent clarifications of the rules for next year.

Tyler, KF3P writes about the new and improved Hal P38 filters that he finds the filters make quite a difference in performance. He says they are so too sharp now...it is very critical on frequency...almost as bad as clover! Tyler found that he sometimes has a hard time copying the AEA boxes running AFSK with their 200 hz shift. He points out the solution to set the width to 185hz (instead of 170) and noted that worked for him.

Another gem I gleaned was that the new MFJ 1278s **do or can** have scope tuning. Their is a header in the new units to accept a small circuit board for scope tuning. A phone call to MFJ technical support the add on board/box is the MFJ 44 at $29.95

That's the bottom of the mailbag, but one last gem for those die-hard-stand alone multi-mode controller folks. (This one's for you Ron) Rumor has it that HAL Communications has a box in the $1,200 price range off the drawing boards. This will be the answer for those that just have to have it. You heard it first in the Digital Journal. I also heard that this new box does Clover, RTTY, Pactor, Amtor and who knows what else.

Now to this month's fun project. As you might re-call I run a bunch of packet on VHF and HF (yeah..yeah...I know) A while back I purchased one of the Kantronics KPC 9612's. I have been using it on one of my Packetcluster's (TM) for some time and have been running BPQ code emulating the DRSI type cards. That works like a gem. However, I have been hearing and have been just biting to get one of the new K-NET EPROM's for the KPC 9612. Just the other day the box arrived from Kantronics with the new EPROM and a couple of manuals. Straight forward, well documented procedures on how-to-do the installation. Took about 2 minutes to have the new EPROM all installed. I had already previously upgraded the memory in the unit to 128 K. That reminds me of one question I need to ask someone at Kantronics. Wonder what the part numbers, specs are for 256K and 512K RAM upgrades. I see that the KPC 9612 will do it, but my manual doesn't give a part number for it. Always something that needs to be asked I guess.

Anyway, I did the hard reset of this thing and then came up and naturally without reading the instructions connected to the new node. Having more than just a little bit of experience with these nodes I quickly figured out that I had to open the book. Darn. Well there are a couple of things you need to set—the name of the node and the callsign. That got me going and I was up and running with about 4 calls all on the same box! Nice thing about having a couple of Ham's in one household and now I even have the trusteeship for the EWARG (Eastern Washington

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Amateur Radio Group) club call. The K-NET node worked just dandy. Mailbox, routes, nodes, heard lists, just about everything you wanted to know about local area networking (LAN).

The KPC 9612 K-NET EPROM instructions are very clear on some of the local networking issues that you will need to deal with in putting one of these up on the air. Politics, plays an incredible giant role in PACKET radio. Follow the guidelines that Kantronics has clearly spent some time thinking about and talk with your local "gurus" before just hanging this thing on your LAN. I first threw the node up on my local packetcluster backbone (one that I run of course). It quickly synchronized with the other nodes and established routes in and out of Spokane. There are a lot of detailed instructions on matching parameters of the K-NET with the local parameters. This parameter matching might be the most important part of packet and the NEPRA folks while in the Seattle area published some very nice thoughts on the subject. On the INW DX system I have an established set that works well for us and I set the K-NET to the network rules. Kantronics did a great job in explaining how all this is important in their manual.

After a couple of day's I put the node up on 145.01 which is one of the local wider area networks here in Spokane. It quickly again established its presence in the network and I found that I could even directly work people that I had not realized that I could link into. Nice thing about dynamic linking tables and the ability to see the statistics on the K-NET another simply great feature. The influence of G8BPQ can be felt in this piece of firmware in many ways. The blend of several things all into one box have moved the KPC 9612 which I have always liked in any case into a much larger role for me. I now have the node up and can send and receive mail from my built-in mailbox. I can link to the packetcluster system very quickly in case of an emergency and I can establish WAN (wide area networking) with links on CLOVER through my W0RLI BBS.

There was only one gotcha with the K-NET node. I will save you a couple of steps of taking it all apart and doing a hard reset. You don't need to set the INTERFACE to NET unless you are linking a couple of the boxes together (another little feature of creating a stack!). You just set the interface to terminal and then you can use the local computer to connect to your node and can run things. If you set the interface to NET it switches into a NET mode and you can't get it out (or at least I never could figure out how) until you take it apart and reset it. That wasn't exactly clear to me so I actually bite the bullet a couple of times before I stumbled on what the words actually say.

The Net part runs while you can be doing something else on the box like being attached to the cluster. Neat idea and glad that I finally got this thing up and running. I of course am running a 9600 baud port on 440 and will pretty quickly have an Internet gateway up and running as I finally got the motherboard back from the RMA folks. Now if I just had a GPS as that's the other part of this EPROM package! (But I don't).

Next month it will be a brief look at Arubian nights and days. A report on the CQWW RTTY contest as Betsy and I will be there before long for some well-deserved rest and relaxation. Actually I should be well rested and home when you're reading this! Now I wonder when my PTC-II box is coming? I sent out a request to see if a review was in order.

73 and don't miss the RTTY Sprint....de Jay WS7I....

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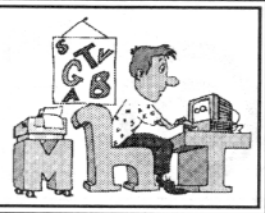
The Last Word

from the Editor

Jim Mortensen, N2HOS • PO Box 596 • Somers, NY 10589
CompuServe ID: 71573,1077



This may be the best part of SARTG. From the stories I've heard there wasn't much in the way of propagation in the most recent rendition of this favorite contest. The unofficial tally, the 'high-claimed' scores tend to confirm the shortfall. But that doesn't keep good things from happening. For example, Jan WA4VQD, who is well known as a DX adventurer, turns out to be a bit of a contest entrepreneur as well. His efforts in this contest are exemplary and teach us all a good lesson. And, I suspect we may hear a lot more from this newly developed team in contests yet to come. Nice job, Hans.

"We tried the multi-single for several reasons. I wanted to introduce several guys in the local club to RTTY contesting, train some people on WF1B software, and see if there was local support for a multi-single in the CQ WW. I am happy to report that it was successful. We had eight people who participated. Six had never seen the WF1B software and four had never operated RTTY. We were successful. Once we got them going we could hardly get three of them out of the operators seat. During the weekend we had about 15 hams come by and check out the operation.

We are doing a club project to build a RTTY unit to work with the HAMCOM software. We have over 30 hams signed up for the kits, so we are generating some RTTY fever. We did not use a second rig to the extent we anticipated. We did use a second computer and audio output into a Hamcom demod to use the spectrum analyzer display from Hamcom. That made tuning for the new guys easier..

We were disappointed with the propagation - especially locally on 80M. We had put up a new caged dipole (inverted V) at 70 feet. Did not get the performance we wanted. Overall, contest was great - and I have a team that wants to do CQ WW. Good luck to all - saw a lot of familiar calls.

SARTG SUMMARY
CALL: WA4VQD
LOCATION: FLORIDA
ENTRY CLASS: Multi-op Single Transmitter
Score: 486,750 (404 Q's including 63 DX)
Moderate Station:
Station: Kenwood TS-440, Heath SB-220, PK-232, PC 286
Antennas: Cushcraft A4 @70 ft, 80M caged dipole at 70 ft, 40M inverted V at 50 ft."

Best 73, Jan A. Heise WA4VQD jan@wa4vqd.surf.tach

Among those who labor in the vineyard Betsy WV7Y is a standout. Long a contributor to these pages as a writer and photographer, she has now taken over IDRA's Software Store shipping operation. This is a major responsibility and we deeply appreciate her careful attention to the myriad details required to make our customers happy. She took it over just as activity picked up dramatically but has responded without a whimper. Thanks a lot, Betsy.

Please understand that Betsy handles all of the shipments, *but not the orders.* All orders must go to IDRA at Goldenrod. You may mail, fax or phone your order to the addresses shown on page three of each issue of the Digital Journal. Goldenrod then faxes Betty with shipping instructions. Your cooperation will be most helpful.

At the last moment, before departing for VK9, Glenn W6OTC passes on a note: "Never a dull moment: Last week Eddie W6/G0AZT had to drop out because of some changes in plan by his son. That is a real loss in operator ability but has also required us to completely rethink our station layouts and gear. We just can't take as much stuff as before. While we were all very sad to have Eddie drop out, he will be with us in spirit: he is making up one of his excellent G5RV's for us to take (good backup, hi) and he will still handle the QSLs. I know the G5RV seems mundane but I was very impressed by the results we got in 8R from Eddie's construction.

I have been very encouraged by the Packetcluster reports from VK, especially on the low bands. It would be great to make a lot of RTTY contacts on 80 and 40m.But we have also seen the band open here to VK up to 15m recently so the high bands may be good also. The biggest unknown for us is what kind of lowband antenna we can get up. We are hoping for an inverted L. A delta loop would be nice but I doubt we will have that much clear real estate. Well, you can see that things have been happening."

Where's the faxed QSL? Doug KF4 KL sends a note from the future: "Finally worked the Easter Island boys on RTTY and got an email message this afternoon confirming it! They've been uploading their logs to an FTP site daily. Who would have ever believed the changes a world-wide network would bring?" *(Well, it should at least cut down on the 'insurance' contacts—Ed).*

Doug, by the way, is the newest staff member of the Digital Journal. He has already completed his first article (see next month's issue) and will soon deliver a series on the subject of DSP and the its impact on the digital modes. More about him next month.

Don't buy that scanner! The cost of a decent color scanner is well above the price of the HAL P38. Yet, the scanner was a necessity for the exchange of full-color photographs within a Clover QSO, even to put your smiling face into Express 3.01 so it shows up when you link with a similarly equipped station. Many, with good reason, were unwilling or unable to ante up the $6-900 bucks necessary to become 'fully equipped.' No longer! A mailer arrived last week, and looking a bit like junk mail, I almost tossed it. But it was bulky and suggested there might be something worthwhile inside. I tore it open and out popped two rolls of 35MM film. Hmmmm! I take a few pictures but nothing to justify that kind of investment. More stuff slipped out of the envelope and then, all of a sudden, I became very interested indeed!

The brochure was not about their speedy developing and fast mail service, it was about "YOUR ROLL OF FILM ON A FLOPPY DISK!" I knew about photos on a CD ROM but it all sounded too expensive, involved and unwieldy. But photos on a floppy, now that is a tune we can all sing. They even send the viewing software which lets you convert photos to over 50 file formats! Slip the disk in your A: drive, copy some or all of the files to your hard disk, then change the format to GIF, BMP or PCX

and either view them on your monitor or move them into Express, compress them and make them ready for transmission on your next link. Each picture takes about 30-40K and they are created in 640X480 resolution and 16 million colors. Here's how it works: send a roll of film for processing, order prints or slides as usual. Then for $3.95 or $5.95 (24 or 36 exposure 35MM) order the floppy. Or send in negatives and they will convert those to disk as well.

The supplier is Seattle Film Works, 1260 16th Ave. W., Seattle, WA 98119. Their phone is 206 283 9074. I am about to send in the first roll of film and some negatives. A full report later. I have used this firm off and on for years and find them to be one of the best photo processors in the business. Try it and let's see more smiling faces, in full color on the air!

Don't buy that new modem yet! Everybody agrees that if you want to browse the Internet you should a)locate a Server who runs a 28.8K node and b) buy a 28.8K modem. Then, according to conventional guru-speak all will be well and you will be able to download anything you want at blinding speed. Maybe. But, maybe not if you use an external modem. I had a US Robotics 28.8K attached to Com1 on my notebook Toshiba. Trumpet would execute the log-on script, but after launching Netscape run-errors started to accumulate, dragging down the speed, until everything came to a halt. My expert and friend (Christine Paustian, who knows it all) tried new settings, higher and lower speeds but to no avail. Finally, she suggested a new communications driver for Win3.1, downloaded the freeware and sent it up to me via E-mail.

So I started at the beginning. I typed MSD at C:>, clicked Com ports, and discovered that Com 1 had an 8250 UART chip and Com 2 (a Megahertz 14.4K PCMCIA modem) had a 16550 UART. No wonder the 28.8K on Com 1 couldn't perform. I installed the new driver and linked to my SLIP connection again, using the PCMCIA modem. The link was made at 14.4, then immediately transferred to 57.6! I have never seen the Internet link perform quite like that before. The graphics didn't explode onto my screen, but there was a certain snap to their appearance even among the drearier home pages. This stems from the new driver's ability to switch the modem to full duplex. There are other refinements as well but mostly the driver gives your computer more time to digest the incoming data. The downloading speeds really astonished me. What a treat. What a discovery.

Now you can have it as well. If you operate in Windows 3.1 or better, if you have a 16550 UART chip (run MSD at the C:\ prompt to check your machine) on one of your Com ports, better get this one. Download the file CYBERCOM.ZIP from IDRA's Web Page. Unzip this very small file and install in a matter of minutes. All you need to do is put the file in your Win/Sys directory, change your Sys.Ini com (accessible via Sysedit.exe) driver and alter a setting in '386enh.' The directions are explicit and easy to follow once you read the Cybercom.txt in the unzipped file. Anybody can do it. And we should thank Doug Scadlock of CyberSoft Corp in NSW Australia. His CIS number is 100033,1723 for this outstanding freeware.

If you switched to Win95, do this! I discovered the hard way (8 hours worth of labor and anxiety) that the Registry File is of more than middling importance. Seems as though I inadvertently wiped out the System.DA0 and the User.DA0 files in a search for old backup files. They don't look at all like that sort of animal but they were treated as such by Norton. So what's the big deal? Seems as though the Win95 Registry corrupts itself from time to time. Those files are labeled System.DAT and User.DAT. When they become corrupted, Win95 dumps them and looks for and then switches to, you guessed it, the .DA0 backup files. And if they aren't there, you start from scratch, rebuilding the entire system.

Avoid such folly by making a second setup of backup files. Copy System and User .DAT files to something like System and User .DA_. Tuck them away in a safe directory or floppy. Then when the fatal message "Registry Corrupted, looking for backup files" you can handle it even if the backup files are corrupted as well. If you buy this insurance policy nothing will ever happen. But if you don't . . . !

This story must be told. It's about a highly educated Extra class ham on a vacation/ DXpedition to a sheep-laden island somewhere in a distant ocean. While he was walking along a road in the countryside he came across a shepherd tending a huge flock of sheep. He says to the shepherd, "I'll bet you $100 against one of your sheep that I can tell you the exact number of animals in this flock." The shepherd looked at the bright-eyed young man and said, "Okay, you're on." The ham glanced around and then said, "973." The shepherd is astonished because that is precisely the correct count, and finally said, "Okay, I'm a man of my word, take your pick." The ham picked up an animal and started to walk away.

"Wait!" cried the shepherd. "Let me have a chance to get even. Double or nothing that I can guess your exact occupation." The ham says, "Sure, go ahead, but that's an impossible job." The shepherd said, without hesitation, "You are an economist for a government think-tank." "Amazing!" cried the man. "You're exactly right, but you must tell me, how in the world did you deduce that?"

"Well," said the shepherd, "put down my dog and I'll tell you!"

Thanks, Internet

The BBS is quiet. As the traffic count on the Web Page increases, the number of calls to the BBS decreases. And now the volume has reached the point where it simply doesn't justify the cost of the phone line. Remember that the IDRA Internet Web Page and the FTP site contains all of the material formerly listed on the BBS. Downloading is everybit as easy as with the BBS. Now's the time to get on-line.

It's that time again. Gen and I flee the frozen north on October 10 and return to the land of grapefruit, swimming pool and antennas. I look forward to each of the above. The address changes as well: PO Box 328, Indian Rocks Beach, FL 34635. Phone 813 596 3105 FAX 813 596 7473.

73, de Jim N2HOS SK

Special bulletin:

"The second annual WW WPX contest, sponsored by the Digital Journal, will take place during the second weekend of February 1996. The dates are set as the 10th and 11th of February, 1996.

Mark your calendar now! The contest rules are available thru the WWW page at <http://www.iea.com/~adrs> in the contest section. They are also available for download from the IDRA FTP site at <ftp:iea.com/public/adrs/rtty-contesting>. We are pleased to announce that the second annual running of what is becoming one of the major digital events will once again have many plaques and awards. Contact Ron Stailey AB5KD for information if you are interested in sponsoring any open plaques or additional awards.
73 Jay WS7I and Ron AB5KD"

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