

DIGITAL

Journal

Formerly published as the
RTTY Journal, and later as the
RTTY Digital Journal

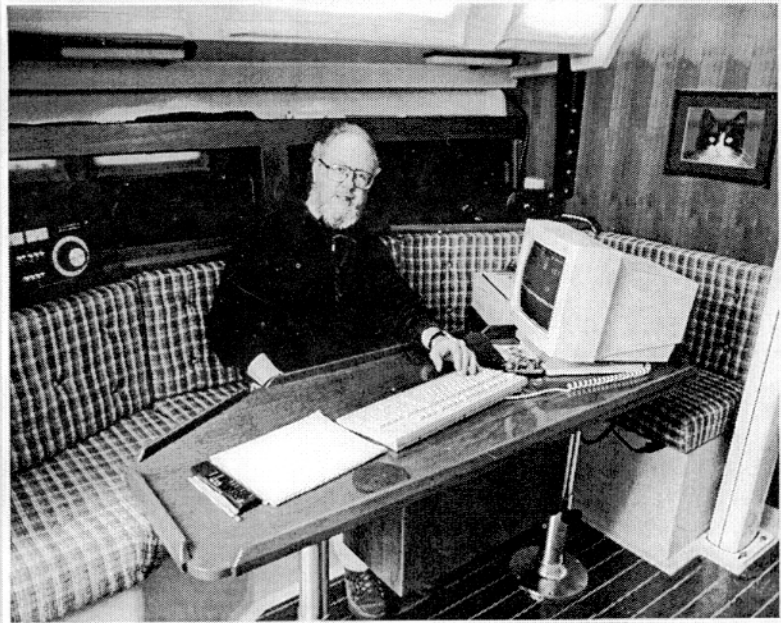
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Ahoy Mates! For more info on this interesting looking shack, please turn to page 15



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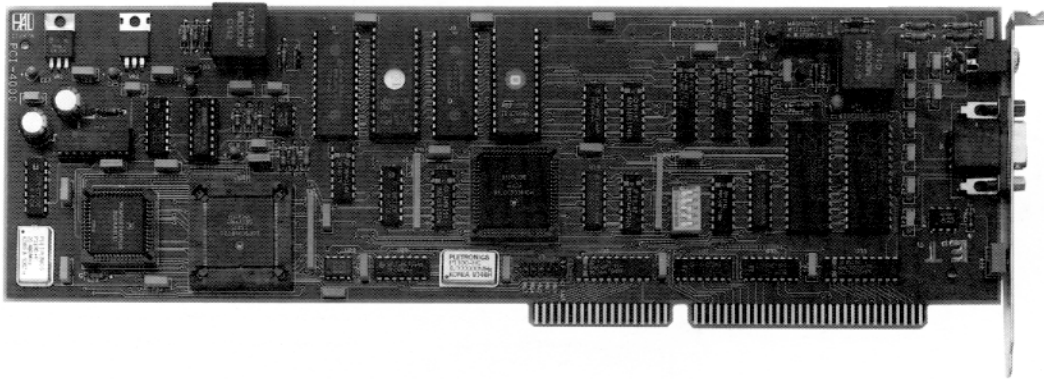
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INTERNET:

WWW Site at: <http://www.iea.com/~adrs>
FTP Site at: <ftp://www.iea.com/public/adrs>
Internet/E-mail: adrs@iea.com

Editor

Jim Mortensen, N2HOS: (813) 598-3105 / FAX (813) 596-7473

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If the **Expiration 02/96** appears next to your name, it means your IDRA membership, and subscription to the *Digital Journal*, expires with this issue. To keep your membership, and all the latest digital news coming your way, just fill out the coupon on page 29 and mail it —

Today!

The most powerful DSP-Modem is now available:

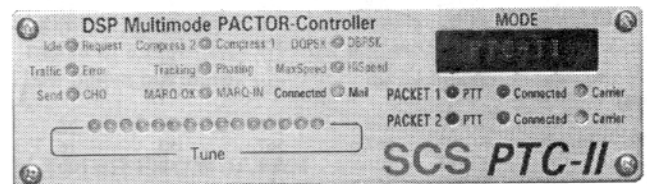
SCS PTC-II

The Multimode-Multiport-Controller with PACTOR-II, the fastest digital mode on HF!

The PTC-II-Hardware:

- Three simultaneously available communications ports: HF and up to two VHF/UHF Packet ports.
- Separate transceiver control port for remote operation of Icom, Kenwood and Yaesu equipment.
- True 32-bit system with the Motorola RISC processor 68360 as CPU, clocked at 25 MHz.
- 16-bit Motorola DSP 56156 clocked at up to 60 MHz (computing power: 30 MIPS).
- Expandable to 2 MB of static and 32 MB of dynamic RAM, firmware stored in flash memory.
- Modem tones programmable in 1 Hz steps.
- All digital modes can be implemented.
- All advantages of the PTCplus are also included.

For more details on the PTC-II and PACTOR-II see the January to April '95 issues of the *Digital Journal*!
Basic PTC-II with 512k static RAM: 950 US\$, Airmailing: 35 US\$ - VISA and MASTER cards are accepted!



The PACTOR-II-Mode:

- In good conditions up to 30 times faster than AMTOR, up to 6 times faster than PACTOR-I.
- Most robust digital mode: Maintains links in conditions with a signal to noise ratio down to minus 18 dB.
- Best bandwidth efficiency: Even using the fastest mode, PACTOR-II requires less than 500 Hz (at minus 50 dB).
- Automatic frequency tracking allows the same tolerance when connecting as with PACTOR-I (+/- 80 Hz).
- Newly developed on-line data compression system (PMC) reduces the data by about factor 2.
- Fully backwards compatible with all known PACTOR-I implementations, including automatic switching.
- Utilizing of the latest coding technology.

SCS - Special Communications Systems

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BULLETIN!

1996 ARRL RTTY ROUND UP

*High Claimed Scores
from Jim Floyd, WA4ZXA*

CALL	SECT	SCORE	Q'S	PTS	QTH	DX
Single Op/HP/All Band						
WP2/KS9W	KP2	139,230	1377	1365	57	45
AB5KD	TX	137,235	1312	1307	56	49
N9ITX/7	MT	128,132	1244	1244	55	48
KF3P	MD	106,848	1029	1008	55	51
WA7FOE	WA	86,664	942	56	36	
A17B	OR	85,170	1017	1002	55	30
WA7FAB	OR	82,710	924	919	55	35
K0RC	MN	69,454	859	847	51	31
VE6JY	AB	68,556	788	788	53	34
N6HC	CA	63,960	820			
WA4VQD	FL	59,843	722	721	53	30
W5YM	AR	47,892	615	614	54	24
WB0BLR	IA	47,795	610	610	51	17
N0AB	NM	40,950	547	546	52	23
KC4UH	SC	39,552	619	618	64	
OH2LU		34,030	410	34	49	
N5XUS	TX	24,832	388	64		
SM3KOR		24,336	314	312	41	37
OH2GI		23,088	296	27	51	
SM3KOR		24,336	314	312	41	37
KF4BU	FL	16,632	256	252	50	16
JH5ZCP (OP JR5JAQ)		13,041	207	207	63	
W2JGR/0	MN	10,710	210	41	10	
ZS6BRH		3,362	84	82	18	23
Single Op/LP/All Band						
AA5AU	LA	87,290	1015	1015	54	32
N1RCT	ME	66,794	751	734	52	39
KA4RRU	NC	61,318	730	713	53	33
V31JU		58,800	735	735	53	27
KK4DK	FL	56,191	677	677	51	32
KN6DV	CA	53,586	700	687	53	25
N9CKC	WI	49,410	610	610	52	29
N1OAZ	NH	47,227	574	569	51	32
K5ED	TX	46,332	572	572	56	25
KE7GH	AZ	45,184	708	706	51	13
K0BX	MO	44,115	519	519	51	34
WA4ZXA	NC	41,148	508	508	54	27
KE2UV	NY	41,064	475	52	35	
CF6FR	AB	38,480	592	52	13	
(OP VE6FR)						
N4SR	VA	38,400	514	514	49	26
VE6KRR	AB	37,422	567	567	50	16
WA6SDM	CA	37,512	521	521	52	20
VE6ZX	AB	35,945	553	65		
W6/G0AZT	CA	27,122	382	52	19	
ON9CKC		24,080	304	301	35	45
K10W	MO	23,643	339	333	51	20
WM2U	NY	20,020	286	286	45	25
KF20G	NY	19,971	317	317	49	14
VE7OR	BC	19,654	317	317	54	8
KA5MGL	AR	15,235	277	277	49	6
OZ5MJ		14,322	218	217	28	38
KC7MJ	AZ	14,098	266	266	46	7
KL7DN/1	VT	13,845	213	213	42	23
N0DH	WA	10,971	207	207	42	11
VE2AXO	PQ	10,962	203	203	42	12
AA6TY	CA	10,550	211	211	43	7
KD0AV	IL	5,368	122	122	41	3
WU1F	MA	4,956	118	32	10	
N2HOS	FL	4,935	105	47	14	
KD4UIE	FL	4,275	95	95	39	6
W1HFN	MA	3,318	79	79	42	0
Mult-Op						
AA4NC	NC	73,402	749	55	43	
VE3FJB	ON	64,152	732	729	50	38
W7LZP	WA	54,901	713	713	53	24
KQ4QM	NC	54,372	591	591	49	43
AA6KX LP	CA	51,030	729	52	18	
AB5EA		44,162	622	622	53	18
N5MTS	TX	39,600	551	550	49	23
NIJEB LP	MA	37,680	592	52	13	23
T91ENS LP	3	1,995	405	405	40	39

So Long Dear Friend . .

SYD WAS ALWAYS INTERESTED IN RADIO AND ELECTRONICS. HE WAS AN AVID SHORT WAVE LISTENER IN HIS TEENAGE YEARS. EVEN IN HIS SCHOOL DAYS, I HAVE BEEN TOLD THAT HE HAD BITS AND PIECES OF CRYSTAL SETS HIDDEN IN HIS DESK.

IN 1939 HE JOINED THE RAAF AND SERVED THROUGHOUT THE HOSTILITIES ON HUDSON AND DC3 AIRCRAFT IN THE OPERATIONAL PACIFIC THEATRE OF WAR, AS WELL AS AN INSTRUCTOR IN THE FIELD OF ELECTRONICS. IT WAS DURING HIS WAR SERVICE THAT HE MET AND MARRIED JEAN.

AFTER HIS DISCHARGE FROM THE AIRFORCE IN 1945 HE BECAME INVOLVED WITH THE ROYAL FLYING DOCTOR SERVICE AS ONE OF THEIR LEADING MOBILE TECHNICIANS IN THE FAR OUTBACK OF QUEENSLAND AND THE NORTHERN TERRITORY. IT WAS DURING THIS TIME THAT HE BECAME A LICENSED AMATEUR WITH THE CALLSIGN OF VK4SE.

AFTER LEAVING THE ROYAL FLYING DOCTOR SERVICE, HE OBTAINED HIS BROADCAST CERTIFICATE AND WAS EMPLOYED WITH VARIOUS BROADCAST STATIONS AND ENDED UP WITH 2UW IN SYDNEY. HE THEN TOOK OUT HIS CURRENT CALL VK2SG.

FROM HERE HE BROADENED HIS HORIZONS BY ASSISTING WITH THE PLANNING AND EVENTUAL OPENING OF CHANNEL 10 TELEVISION STUDIOS. HE SERVED IN THEIR STUDIO AND EVENTUALLY THE TRANSMITTING FACILITIES. HE EVENTUALLY RETIRED FROM CHANNEL 10 AROUND 1980.

ALL THROUGH THESE YEARS HE WAS AN ACTIVE AMATEUR, GAINING DIFFERENT AWARDS FOR DIFFERENT FIELDS OF COMMUNICATIONS, AND STILL CONTINUED EXPERIMENTING WITH DIFFERENT ASPECTS OF HIS HOBBY.

IN 1970 SYD WAS RESPONSIBLE FOR THE SAFE COMPLETION OF THE FIRST 8600-MILE VOYAGE OF THE RAFT - LA Balsa - ACROSS THE PACIFIC FROM SOUTH AMERICA TO AUSTRALIA. THE RAFT'S RADIO EQUIPMENT MALFUNCTIONED APPROACHING AUSTRALIA AND IT WAS WITH SYD'S TECHNICAL KNOWLEDGE AND DEDICATION THAT ENABLED THEM TO MAKE THEIR SUCCESSFUL LANDFALL.

IT WAS DURING THE LAST 15 YEARS THAT HE BECAME INTERESTED IN DIGITAL METHODS OF COMMUNICATION AND WAS IN THE FOREFRONT OF ALL DEVELOPMENTS OF THESE NEW MODES. MUCH OF THE ORIGINAL EQUIPMENT THAT WAS USED WAS SURPLUS DISPOSALS AND SYD, WITH HIS KNOWLEDGE AND EXPERTISE, DEVELOPED NEW IDEAS.

HE WAS ONE OF THE FOUNDATION MEMBERS OF THE AUSTRALIAN NATIONAL AMATEUR RADIO TELEPRINTER SOCIETY AND WAS A REGULAR PARTICIPANT IN MANY CONTESTS AND FURTHERED AND ENCOURAGED YOUNGER MEMBERS OF THE AMATEUR FRATERNITY TO BECOME ACTIVE AMATEURS IN THE DIGITAL MODES.

SYD WAS KNOWN THROUGHOUT THE WORLD WITH HIS ORIGINATION OF THE RADIOTELETYPE DX NOTES AND, ALTHOUGH HE GAVE THE ORIGINATION OF THESE NOTES TO OVERSEAS AMATEURS AFTER ILLNESS FORCED HIM TO CUT DOWN ON HIS RADIO ACTIVITIES, THEY ARE STILL SENT WORLDWIDE WEEKLY AND KNOWN AS THE "VK2SG DX NOTES" - THEY EVEN NOW APPEAR ON THE NEW SUPER HIGHWAY - THE INTERNET. SYD HAS MANY AMATEUR FRIENDS AROUND THE WORLD WHO REMEMBER HIM FONDLY AND WILL MISS SEEING THAT VK2SG CALLSIGN ON THEIR SCREENS. SYD'S PIONEERING IN AMATEUR RADIO HAS GIVEN MANY THOUSANDS OF PEOPLE AROUND THE WORLD A LOT OF PLEASURE.

HE IS SURVIVED BY HIS WIFE JEAN.

Eulogy written by Bill Storer, VK2EG

DX NEWS

The latest digi-doings from around the globe

by Jules L. Freundlich, W2JGR

825 Summit Ave., Apt. 1401 • Minneapolis, MN 55403-3188



Thanks for the memories!

This is my 35th regular DX NEWS column. I have come to the conclusion that it is time to give the column a "new look". With an able, energetic DXer now on board, I am happy to pass the mantle to Don, AA5AU.

This column has had a number of notable authors over the years. Back in the dim ages, when I wasn't even aware of RTTY, my friend Bill Snyder, W0LHS, now 79, gave you the latest on RTTY DXing. Bill still writes a monthly 'Digital Bus' column for Worldradio.) I do not know all who followed, but sometime later, it was Roy Gould, KT1N. When Roy had to give it up, he asked if I would like to do it. I declined at that time but suggested John Troost, TG9VT. John was a natural as he was the focal point for the distribution of the weekly RTTY DX Notes compiled by Syd Molen, VK2SG. As these Notes are a fertile source for RTTY DX News John readily accepted, and added a new element of humor to the column. When John could no longer do it, I was able to jump in.

Now, after three years at it, I have decided to follow a new path. My plans envision some extensive traveling, including Dayton 1996, accompanied by my trusty laptop. I will still be contributing to the Digital Journal, as sort of a roving DX reporter. You might even find me operating on RTTY from some DX location, but don't expect me to show up from one of the Ten Most Wanted DXCC countries!

The words of encouragement and appreciation, the contributions of DX information, that I have received, as well as the making of countless new friends, have made the writing of this column a rich and rewarding experience. My hat is off to all of you who expressed your support. Many of you even told me that the DX NEWS was the first thing you turned to when a new issue arrived in your postal mailbox. I am sure you will find Don, AA5AU, worthy of similar responses.

RANDOM NOTES

According to several recent Internet postings by Lee Wical, KH6BZF, the current Solar Cycle can be expected to bottom out sometime between December 1995 and May 1996. Remember that the bottom is defined as when the number of sunspots are at a minimum, not when spots of opposite polarity of the new cycle first appear. The trouble is, we won't know for sure until about six months after the event. As Lee has often said, "Always expect the expected, as well as the unexpected."

Thanks are due from all of us who need Kerguelen on RTTY, to Henry Lumpe, DJ6JC, to whom I addressed an urgent request last October. Henry generously offered to lend to FT5XL, on short notice, his Olivetti M10 computer with an integrated terminal program. Henry has used that computer on all his DXpeditions, so we know it works well. FT5XL arrived on Kerguelen as planned in November, but as of this writing at year's end, there have been no RTTY sightings of him. KYFC.

For those of you still waiting for QSLs confirming VP8CQS, South

Shetlands, take heart. I finally received mine in December, for an April QSO. I had sent cards to both DL1EHH and SP2GOW. The received envelope has a Poland stamp affixed (SP2GOW), but the card was signed 'Roman', which is the name of DL1EHH!

In my DX NEWS column of July/August 1993, I noted that the then UZ9CWA (now RK9CWA) was still eight countries shy on 80 meters for five band DXCC on RTTY. They had already achieved four band DXCC on 10-40 meters. Recently, Serge, UA9CGA, told Ron, AB5KD, that they have now received confirmation of the last eight countries on 80 meters. They are hoping for a special award for this unusual accomplishment. Unfortunately, as with the Worked All States (WAS) Award, there is no mode-related 5BDXCC endorsement. It is my suggestion that they submit their cards to the DXCC anyway, so as to receive the recognition of their accomplishment, especially during a waning sunspot cycle.

Joe, IOAOF suffered from the same frustration of having Worked All States on RTTY, but could not obtain a RTTY endorsement. Achieving WAS or 5BDXCC on RTTY, at this point in time, must be considered singular accomplishments. It's too bad, the awards program is not structured to recognize the very unusual. The very least we might expect would be a Special Letter of Recognition. You may argue that, using the same logic, we should have settled for no RTTY Honor Roll at the time Gin, JA1ACB, achieved that level. However, it was evident at that time that others were slowly approaching Honor Roll status. The fact that my petition to create a RTTY Honor Roll was eventually approved by the DX Advisory Committee and the ARRL Awards Committee, demonstrated they recognized that there would eventually be others who would find their way to that level. Time has borne out that assumption. I have not heard of any other station approaching the accomplishments of IOAOF (RTTY WAS) and RK9CWA (RTTY 5BDXCC). Are others out there?

LETTER FROM JAPAN

Some time ago, I discovered that Shun, JF1MGI, who is an active RTTYer, also sported a VK9 call. This tipped me off that perhaps he might be doing some traveling to other non-JA locations. I would like to share with you a letter I received from him recently about his trip to Madagascar, where he operated as 5R8EU.

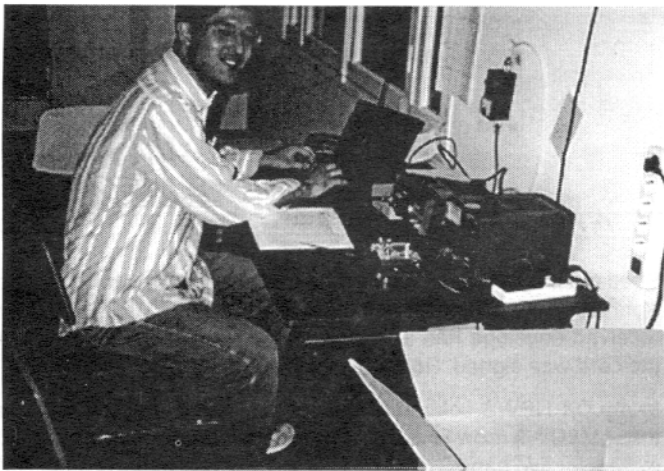
"Hello, digital DXers! I am Shun, JF1MGI, a Doctor of Veterinary Medicine, and 25 years old now. I've been a ham for ten years, but started RTTY just five years ago. As of now I have 295 countries confirmed for RTTY DXCC. I prefer ragchew to the "UR 599 BK" style of QSO on any mode.

My HF radio equipment consists of:

Transceiver: TS-940SL, TS-440S/AT, and an FT-900/AT

Terminal Unit: Two ST-6 style TU's for Baudot, and a PK-232MBX for Pactor

Antenna: 4-el Yagi for 20/15m, 2-el Yagi for WARC bands, rotary dipole for 40m, long wire for lower bands. They are around 15 meters high on the same roof tower. Unfortunately it's very



Shun, operating RTTY at 5R8EU



Shun, JF1MGI (Left) and Ben, PA3BXC/5R8DS

EXPRESS, as soon as possible, but I am too busy to do it now. If you find my callsign on your screen, please call me for an enjoyable ragchew (of course except in contests), not only exchanging RST and QRA/QTH. Good DX on digital! 73, de Shun JF1MGI."

By the way, Shun's e-mail address is: 67013852@people.or.jp

FINALE

That's it for this time, folks. I am looking forward to my changed life pattern, and hope to be able to share some new digital radio experiences with you all from time to time, from various places. In the meantime, enjoy yourselves, and when you are sweating out a new one in a pileup, remember it's a hobby, and we do it for fun.

For now, bye bye from Minnesota....PAX...73 de Jules W2JGR (W2JGR/OH2, W2JGR/VP2M, TG9/W2JGR, HD5Z, HC5/W2JGR) Internet: w2jgr@millcomm.com

hard for Tokyo residents to operate under excellent conditions with high power to good antennas up high.

Software: RTTY by WF1B, BKMULTY, XPCOM

I stayed on Madagascar (Malagasy Republic) for a month in October 1995 to watch lemurs for research, and to meet a good friend of mine, Ben, 5R8DS. I operated 5R8EU on 40/20m RTTY and SSB, (see photos) but I didn't have enough time for radio and so could not make many QSOs. I sometimes go to African countries for animal investigations (once or twice per year), and will try to be on the air much longer when I visit other rare places in the future.

I would like to prepare equipment for CLOVER, P38 board, and

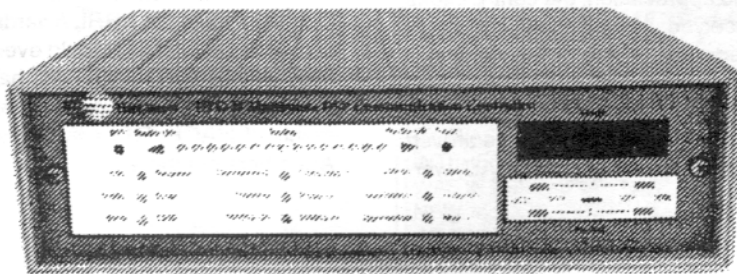
The PacComm PTC-II

The PTC-II is a new multi-mode controller and "communications platform" which contains powerful and flexible hardware and firmware.

Built in the United States by PacComm under license from S.C.S., the group that developed both the original PACTOR and PACTOR-II.

The PTC-II offers the most robust HF digital protocol available to radio amateurs, but it should not be overlooked that the PTC-II is configurable as a triple-port multimode controller supporting packet data rates of 1200 and 9600 bps and numerous other modes.

- A step-synchronous ARQ protocol.
- Full support of memory ARQ.
- 10 character MODE display, multi-colored LED tuning and status displays.
- Watchdog timer on HF PTT port.
- Specialized communication program provided.
- Firmware contained in Flash memory. Easy upgrade.
- Long-path capability for worldwide connectivity.



- Full compatibility with PACTOR-I (the original PACTOR), AMTOR, and RTTY.
- Automatic switching between Level-1 (PACTOR-I) and Level-2 (PACTOR-II) at contact initiation.
- All-mode mailbox with up to 32 megabytes of storage.
- Occupies a bandwidth of under 500 Hz - use your 500 Hz CW filters.
- DBPSK modulation yields 200 bps (uncompressed).
DQPSK modulation yields 400 bps (uncompressed).
8-DPSK modulation yields 600 bps (uncompressed).
16-DPSK modulation yields 800 bps (uncompressed).

- Independent of sideband; no mark/space convention. Center frequency adjustable between 400 and 2600 Hz to exactly match your radio's filters.

- Differential Phase Shift Keying with two continuously transmitted carriers. 100 symbols per second. Constant bandwidth irrespective of actual transmission speed.

- Powerful Forward Error Correction (FEC): High performance convolutional coding. Constraint length of 9. Viterbi decoding using soft decision point. Coding rate varies between 1/2 and 7/8.
- Intelligent data compression monitors compression ratio and self-bypasses if not being effective. Huffman compression for English or German text. Markov (2 level Huffman) compression. Run-Length encoding for repeated sequences.
- Limited availability. Packet modems available later. \$995. Packet modems are optional at extra cost.

DSP firmware now supports audio filtering.

PacComm Packet Radio Systems, Inc.

4413 N. Hesperides Street, Tampa, FL 33614-7618 USA

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Facsimile: +813-872-8696

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BBS: +813-874-3078 (V.34)

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URL: <http://www.paccomm.com/info>

Across the Pond

Digital news and events communicated from our European neighbors

Edited by Neal Campbell, ON9CMC

Internet: neal.campbell@ping.be



Its a brand new year and I hope 1996 is a great year of explorations and discoveries! With luck, you have received new tools and toys this Christmas to enable your explorations.

As we are focusing on CLOVER, I thought we should start the new year by examining the benefits and history of CLOVER. We will end with a small tour of EXPRESS, software written by TY1PS that fully utilizes CLOVER, as well as the other modes that PCI-4000/M and P38 cards support.

What is CLOVER?

CLOVER was invented by Ray Petit, W7GHM, while working at HAL Communications Corporation. The first CLOVER product for amateur radio usage was the PCI-4000 card, sold by HAL in 1991.

Ray developed CLOVER after an extensive study of the limitations of PACKET on HF, trying to optimize digital throughput over HF links. To overcome HF PACKET's limitations, CLOVER was developed to automatically adapt to changing band conditions, as well as correct many transmission errors by the receiving station. Finally, CLOVER uses very little bandwidth. You can easily use your 500 Hz filters when working CLOVER, giving more stations opportunity to converse without disrupting nearby stations.

Instead of the traditional MARK and SPACE tones used by RTTY, AMTOR, PACTOR and PACKET, CLOVER uses 4 tones that are time-sequenced with wave-forms that are very carefully shaped to fit within 500 Hz. Unlike the usual ARQ modulation modes of AMTOR/PACTOR, CLOVER has 8 different modulation modes. These modes are managed automatically by CLOVER, adjusting with the other station you are linked with to provide the best bandwidth under the current operating conditions. The eight modulation modes can provide bandwidth from 18.75 to 750 bits per second! CLOVER also has a FEC mode for multi-station QSO's.

CLOVER is continually checking conditions with the station you are linked with to monitor the signal-to-noise ratio (S/N), frequency dispersion and time dispersion. By continually monitoring each others' performance, either station can decide to downgrade or upgrade the throughput by switching modulation modes. Watching this happen while you are in a QSO is often as fascinating as the actual QSO itself! You can also tell when bands are getting ready to shut down and often can say 73s and shut down the link before you lose total contact. One of the most frustrating aspects of AMTOR/PACTOR can be losing contact with a station without having the pleasure to thank them for the nice QSO and wish them well.

CLOVER also utilizes technology from the telecommunications industry to not only detect errors in data (like AMTOR and PACKET), but to be able to correct many of the errors it detects. By using Reed-Solomon error correction encoding, CLOVER can fix small problems without having to ask the sender to re-transmit a packet. This can greatly improve data throughput, especially with the small static waves we often here even during good band conditions. Of course, there is a limit to the number of errors that the Reed-Solomon error encoding can fix. When too many errors are detected, CLOVER will ask for re-transmission.

By packing all of this technology into a 500 Hz waveform, CLOVER makes the bands more user-friendly. 5 QSO's in CLOVER can occur within 2.5 kHz, while 5 AMTOR signals require 5 kHz and 5 PACKET signals require 10 kHz!

Where did the name come from?

Because of the 4 tone modulation pattern, the original name was CLOVERLEAF. It was shortened to CLOVER by the time it hit the market. I have no idea if Ray Petit is of Irish heritage, but the modulation technique has proven to be quite lucky for amateur radio!

Why isn't everyone using it?

For any new digital mode to be successful, enough people must buy hardware/software that optimally uses the advantages of the technology to meet their needs. Since two stations must be CLOVER-capable, you need enough people out there to buy it. Just simply having the best technology does not guarantee success. The Apple Macintosh history shows that product domination by one company presents a large barrier to market acceptance.

As with all things, this amount of technology does not come for free. The first HAL product for amateur radio utilizing CLOVER was the PCI-4000. It was originally a CLOVER-only product that sold for nearly \$1000! Would you buy one waiting for other people to buy one so you can determine how useful CLOVER really is? I looked at the PCI-4000 demonstration every year at Dayton, always impressed with CLOVER and depressed by the price.

In later years, HAL included AMTOR, PACTOR and RTTY capability in the PCI-4000, now called the PCI-4000/M, and reduced the price, but it is still \$800.

CLOVER is a proprietary waveform, owned by HAL Communications. While there are occasional rumors that HAL might license the technology to other companies, you can currently only operate on CLOVER by buying a HAL product. While HAL traditionally offers outstanding engineering and technology, no free-market competition exists to drive prices lower.

With small market penetration, there were few programs that could utilize CLOVER to best advantage, as it was not worth the effort. Because of this, the primary software used by most of the early adapters was HAL's software that comes bundled with the PCI-4000. Some love it, some hate it. It is safe to say that enough choices did not exist to tailor to everyone's tastes.

Why should I be using CLOVER now?

The best news for CLOVER is the P38, a product released by HAL in the Spring of 1995. The P38 uses less expensive DSP processors to offer performance very close to the PCI-4000/M card at a very low price. The P38 sells for about \$400, and also does an excellent job on RTTY, ASCII, AMTOR and PACTOR. In fact, many of the CLOVER addicts I talk with bought the P38 just for its RTTY performance.

While there is no direct competition for CLOVER-capable devices, HAL realizes that PACTOR 2 and G-TOR offer improvements that

start to compete with CLOVER. These modes are available on multi-mode controllers, hence, HAL is now competing on a price level with multi-mode controllers. I have no financial relationship with HAL, but it is hard to imagine a DSP-based system selling for \$400 that competes with the P38.

As the number of P38 and PCI-4000/M customers increase, it has brought many of the best software developers into the market. Ray, WF1B, has supported the PCI-4000/M and the P38 almost from the start with RTTY. RagChew, by Jim KE5HE, Winlink, WORLI, W9CD, and new authors everyday offer software that utilizes the P38.

Finally, Express by Peter, TY1PS, offers to my mind the best software on the digital HF market today. In a minute I will start a guided tour of Express.

All of these changes have resulted in many new amateurs owning CLOVER-capable hardware. Everyday I am on the air I meet someone new to CLOVER. The bands are starting to become crowded with CLOVER signals and the enthusiasm is rapidly growing.

All on-board TY1PS' EXPRESS!

When I bought my P38, it was primarily for the excellent RTTY performance. Since I enjoy RTTY contests, I wanted the best weak-signal RTTY modem that I could afford. The fact that the P38 could do CLOVER was of interest to me, but only a secondary interest. As long as WF1B's RTTY worked with the P38, I was satisfied in ordering it.

I had owned the HAL PCI-3000 card prior to the P38. While many people did not like the HAL PC-AMTOR software that came with the PCI-3000, I had no real complaints with it. It was not the snazziest software I had seen, but it was simple and did most everything I needed to do, except contests. When I read product reviews of the P38, it was obvious that HAL had not changed their approach to P38, the software that comes with the P38 card. Functional but hardly exciting!

After my first 10 QSO's in CLOVER, I realized that all were using the same software, EXPRESS by Peter, TY1PS. When I started asking why, it became obvious that this was very exciting software.

EXPRESS is a Windows-based program that allows for very automated operation of CLOVER, AMTOR, FACTOR and RTTY. It has a built-in mailbox system, plus graphic and file transfer capability. It also has a logging system, a means to view pictures and an interactive sketch pad. Sounds very complex doesn't? It is well-behaved under Windows 3.11, Windows for Workgroups 3.11, Windows 95 and OS/2 Warp. I haven't tried it under Windows NT but I believe that should be no problem either!

Installing EXPRESS

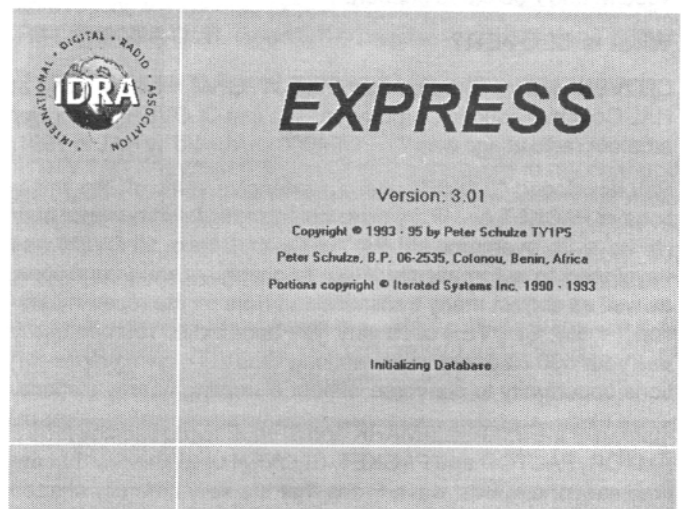
As of this writing, the latest version of EXPRESS is 3.0.1. When you order EXPRESS, you must provide your callsign as it is "burned" into the program. When you receive EXPRESS, it comes on 2 3.5" floppy disks. Depending on your operating system, you must RUN A:SETUP.EXE from the first floppy disk. You can do this from the Program Manager, File Manager, the START button or by command-line interface from OS/2 Warp.

Installing EXPRESS is a pretty typical process with which Windows-oriented users will feel comfortable. The SETUP program will create a new EXPRESS directory, if you chose, and load files into that directory and the Windows System directory. After about 4 minutes, EXPRESS is installed and waiting for you!

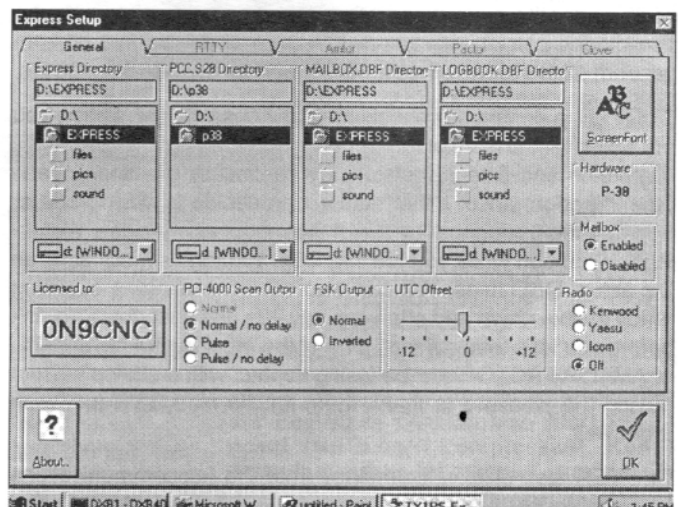
One small caveat with version 3.0.1.: If you have more than one drive (i.e., C, D, etc.) and install EXPRESS on other than the C drive it will occasionally forget where the firmware files for the PCI-4000/M or P38 card are located. If you, like me, normally install all programs on D drive, and only use the C drive for DOS, EXPRESS will often look for the firmware files on C drive. I just created a directory for the P38 firmware files on C and keep copies of the latest firmware files there. This small bug might be fixed by the time you read this!

Starting EXPRESS

Once you double-click on the EXPRESS icon, the program begins by searching all of the possible locations that your PCI-4000/M or P38 card might be located. With luck, EXPRESS finds your card, downloads the firmware files, then initializes the card for the last mode that you operated the previous session you had with the program.



The very first time you start up EXPRESS, you should click the Setup button in the upper right side of the screen. This will present you with the tabbed screen seen below.



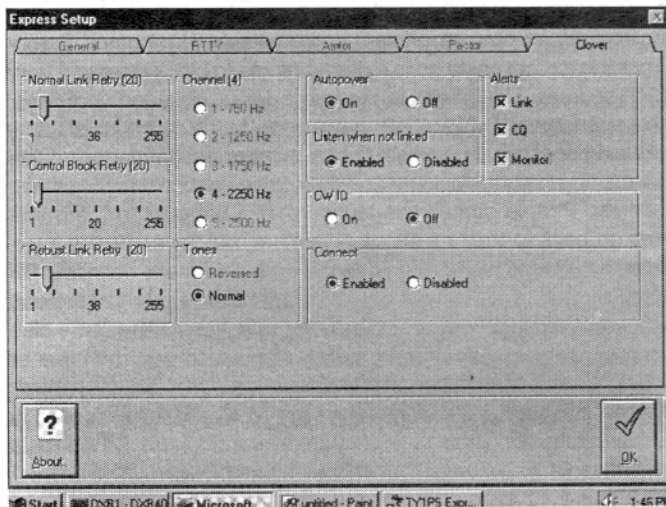
As you can see, the "General" screen has some very important settings.

You set the directories for the EXPRESS program, its mailbox and log directories, as well as the directory that the firmware files are located for the PCI-4000/M or the P38 from this screen. Although the firmware files are not called PCC.S28 for the P38 as they are for the PCI-4000/M, the heading applies for P38 firmware file location.

You can tell EXPRESS the difference between your computer clock versus GMT, as well as enable EXPRESS to talk with your rig's computer control. As you can see from the above example, I have disabled the rig-control feature as I use DXBase for logging and prefer to let that program have control of my rig.

You can also enable or disable the mailbox feature of EXPRESS from this screen. If you are just getting used to EXPRESS I recommend disabling the Mailbox, as it can appear to be acting strangely until you understand how it works. I will explore the Mailbox in a future article.

If you click your mouse on one of the tabs at the top of the screen you will see screens that apply to each of the modes supported by EXPRESS. Since we are looking at CLOVER, the setup screen for CLOVER is shown below.



Upon inspection of the CLOVER Set-up screen, it can seem quite daunting. After all, what does channel refer to? What are the optimum retry values? How will I ever figure this stuff out?

The easiest thing to do is let Peter's experience be your guide. Until you are more comfortable, generally use the default settings provided by TY1PS.

I always have the "Listen when not connected" setting enabled, as it lets you watch other stations while in QSO. Not only is this interesting (there is a bit of the voyeur in us all!), it is a good way to learn how others operate CLOVER. As we will discover next issue when I take you through your first CLOVER QSO, its not like any mode you have ever worked before!

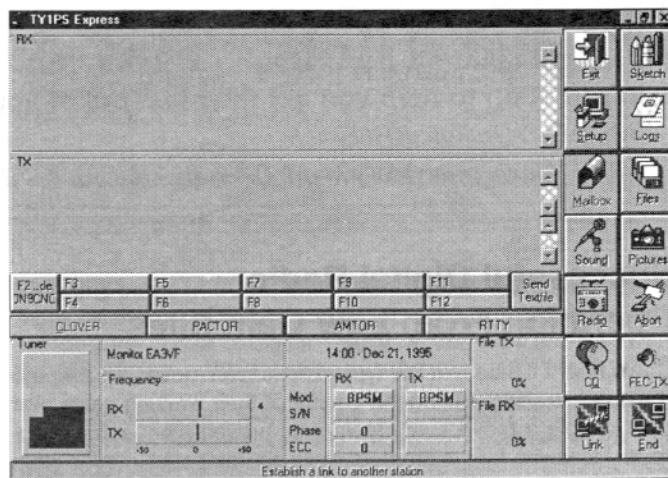
I also turn the CW ID setting off. The HAL cards allow for periodic signing of your call sign in CW. While emphasizing that in the United States that legally no CW ID is necessary, HAL recommends leaving CW ID enabled. This means that periodically, CLOVER will stop its waveform and send a CW ID. I find no one really follows HAL's advice, and it slows things down. We are in this for the speed after all, so why revert to the original digital mode for signing?

Of course, make sure that "Connects" is enabled to be able to let people contact you!

EXPRESS tour of the neighborhood

Once you have your set-up settings in order its time to take a quick stroll around the general operating screen of EXPRESS.

On the very right of the screen are the control buttons for EXPRESS. Here is a brief description of each button, as provided by TY1PS:



Exit: End EXPRESS

Sketch: Open the EXPRESS Sketch Window

Setup: Open the Parameter Setup Window

Logs: Open the logbook

Mailbox: Left button opens the mailbox, right button turns the mailbox on/off

Files: Open the file transfer window

Sound: Open the voice editor

Pictures: Open the image editor

Radio: Open the radio control window

Abort: Immediately abort the current activity

CQ: Start calling CQ

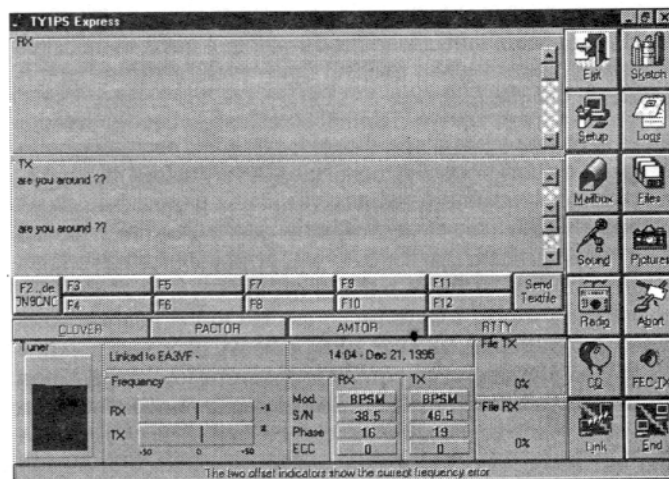
FEC-TX: Start transmitting in FEC mode

Link: Establish a link to another station

End; Shutdown the link.

Any of these controls can be activated from the keyboard, via ALT + keystrokes. The letter that is underlined in the control title is the letter to enter in combination with the ALT key.

You see where received text is displayed. Below this is the TX field. This field is actually two fields. You type text to send to the other station in the bottom half of the field. In the upper half of this field, the text is displayed as it is transmitted. This gives you the opportunity to correct spelling mistakes and see how efficient the link is operating. An example of this is shown below.



Below the controls that represent function keys. You can set the text for these function keys by clicking with the right mouse button. You can send this text by either typing the function key or clicking it with the left mouse button.

I will examine the bottom of the screen, along with walk you through your first CLOVER QSO next month!

Digital Hints, Tips & Operations

Information to help you get the most out of your time in the shack

by Dr. Ben Grockett, KR6E

853 N. Alexandria • Hollywood, CA 90029 • CIS: 74761,1143

Successful Digital Radio Operation From Low Gain Sites

I have heard it said that the typical American moves an average of every five years during the course of their working years. For most people a move every few years presents no undue hardships. However, for the amateur radio operator such moves often do away with dreams of large antenna arrays and the hunt for rare DX stations that only they can hear. Dipoles and small beams are used by many amateurs who have found it necessary to compromise their antenna installations due to other priorities in life. It is still possible to be very effective in "working the world" from such an installation if attention is paid to a few radio practices that become even more important at a low gain site. This is particularly true for those of us who enjoy using the HF digital modes. I say this because voice signals are complex analog signals that tend to be very tolerant of different types of random natural and man-made noise. This is not true of most digitally formatted data even though error recovery schemes are becoming more and more sophisticated. Most digital modes require near perfect reception with a "packet" of data before it is acknowledged. Even a relatively minor noise source can slow an ARQ link to a snail's pace as the signal to noise ratio approaches unity.

Noise elimination is absolutely essential for successful HF digital operation and this can be achieved through a combination of techniques. First, it is necessary to identify all local noise sources. A sensitive AM radio can be very useful for the task. Tune the radio to an open spot on the dial and begin looking for your noise source. In most locations this is a continuous job that requires constant vigilance, especially in urban areas. Typical noise sources I have encountered over the years are such things as dirty high voltage insulators, worn contacts on street lights, appliances, electric fences, aquarium heaters and "hot rocks" from terrariums, and brightness control modules in house wiring. It helps to be single minded in purpose when tracking down noise sources but it is well worth the effort.

Probably of near equal importance to locating and controlling noise sources are good grounding techniques. A very helpful radio practice is to tie all radio equipment to a common ground buss. I use one inch copper ribbon to tie all my radio gear to a common ground point. Never assume that the local wall power source has a good RF ground! Most of the time this is not the case. Your common ground buss should always be connected to the nearest water pipe or earth ground. I do this using a heavy copper ribbon and attach it to the grounding pipe or rod with hose clamps. Good grounding of all equipment (including computers and other non-radio equipment) can result in more stable performance and more effective use of shielding. If your station is not close to a good earth ground then a practical alternative is to create a tuned "artificial" ground. The MF3 Model 931 is great for this purpose. Once, when operating from an Arctic location I was able to lay a wire on the ice and I tuned it as an artificial ground. The result was a stable and quiet receiving site where there was nothing but QRM and interstage noise before the tuned ground was installed.

It is also helpful to ground "floating" metal structures such as equipment racks, desks, and metal window frames that may reradiate RF energy and cause an increase in noise or spurious signals. Recently, when reassembling my radio station at a new location I found it necessary to ground a large steel operating desk and doing so resulted in a great reduction in my local noise level.

A special problem for the modern radio amateur is the noise radiating from display devices, printers, computers, and keyboards. Sometimes it is necessary to go to extreme length to block the noise from such sources. Line filters, ferrite in-line filters, shielded data lines, and even special enclosures have been found to be effective in reducing or eliminating noise. Digital printers are a notorious noise source due to poor shielding and their close proximity to the station receiver. People sometimes laugh when I suggest to them that they go back to their mechanical printers, but for someone interested in working weak signals these old printers are definitely RF quiet! By writing incoming copy to disk and then printing at the end of a copy session you can completely avoid one important noise source. Also, another strategy in noise reduction is to use steel or copper screen at 20 or greater mesh for shielding CD's, or floppy drives. In severe noise environments or where noise reduction is critical it is helpful to put hinged copper screen "doors" on cabinets to reduce noise from open enclosures that require occasional access. It is very important that all data and power lines which run between the station equipment be properly shielded and grounded. If the interference is severe, enclosing cables in braided shielding or solid copper tubing also serves to cut down noise. Keyboards are also a potential source of severe noise. By unplugging your keyboard from the computer it is easy to determine how much of a contribution your keyboard is to the locally generated noise. I enclose my keyboards in solid copper enclosures made from surplus circuit board material and then I ground the enclosures to the system ground. Although not perfect, this method of noise reduction can make an amazing difference in the ability to hear weak signals. Conductive paints are also very valuable in reducing noise if the surfaces have proper connection to the system ground. There are many specific techniques for the reduction and control of RF noise. A good collection of this information can be found in the ARRL's publication "RADIO FREQUENCY INTERFERENCE. How to Find It and Fix It."

When amateurs are faced with less than ideal sites they must pay greater attention to the short and long term propagation cycles or events. Productive operating periods can still be achieved by matching your radio recreation time to predicted periods of optimum propagation. Another useful trick to allow relatively quiet multiband operation is to use open wire line to transfer power to the station antenna. By using balanced transmission line and a tuner you can achieve maximum possible efficiency in transferring energy from the rig to the antenna and from the antenna to the station receiver.

In some cases greater attention to signal processing can give low gain sites an even shot at the weakest of signals. The use of intelligent demodulators in combination with good noise reduction techniques allows the reading of signals that many stations

(cont'd on page 28)

Hardware Reviews

Featuring the latest offerings from our manufacturers

by Peter Schulze, TY1PS

CIS: 72253,2602

A new DSP HF modem from HAL Communications

About two weeks ago, a long awaited parcel made it to my door. It was a bit late due to the French being on strike. Nevertheless it came here from the USA in less than 10 days and contained two smart little boxes with the latest members of HAL-Communications range of DSP HF modems—The DSP4100. This is their first ever external modem and it will surely become a winner among us hams as well as commercial users. The DSP 4100 comes in a very solid black metal case of about the size of most popular phone modems. It is much smaller than most other HF modems and will be a nice addition to every DXpedition, and easily go with you and your laptop on your next vacation.



It runs on 12 volts DC and is connected to the PC via a standard DB-25 RS232 connector on the back of the unit. The cable to the radio uses the same DB9 connector we are already familiar with from the PCI4000 boards. 12V DC is applied on a connector, similar to those used on the PK232 and most other modems. A quick glance into the box revealed the standard package of complete accessories HAL is known for. All cables and connectors are there and their care saves you the walk to Radio Shack just to get the new baby connected. No strange plugs on the DSP4100 that you can't find out on that island, nor will you burn your fingers when trying to solder the sub-miniature connector.

Hooking up the DSP4100 here was done in less than 5 minutes. The radio cable is the same as for the PCI4100 and readily fits. The PC serial link uses a standard modem cable and the 12V DC was quickly connected to the transceiver's power supply. The only alignment needed is to set the audio output level with a little potentiometer that can be easily reached on the back of the unit. The DSP4100 has only one switch: ON/OFF. So certainly bringing the DSP4100 to life was easy to do. HAL supplies its PCC software with the units. This is the same program many of you know from the PCI4000 or P38, but this release knows how to talk to the modem via a serial port instead of looking for a PC-board. Installation of the software is a snap and it came up right on my screen.

I then received my first surprise. I started PCC.exe and the screen was ready for a Clover QSO almost instantly. No more 'Looking for card' or 'loading S28...' messages! The DSP4100 has new Flash ROM's that keep all the execution code for the DSP and the control processor in the unit, even when you switch it off. Therefore it is no longer necessary to upload code into the modem every time you start using it, thus the instant start of PCC. The best part is yet to come—with all the code present in the modem's Flash-ROM,

switching between Clover and FSK modes is now instant too! No more waiting for the files to upload, just choose your favorite mode amongst the choice of Clover, Pactor, Amtor, Ascii and RTTY and the unit is ready without delay.

This does not mean that we lose the possibility of updating the modem in the field. You can still upload new releases of the firmware from your PC when they become available on the HAL BBS, IDRA FTP site or elsewhere. Only difference is that you do this only once when you get a new version, the DSP4100 will then keep the data.

Tuning to 14065.5 quickly raised some Clover stations for a chat and the DSP4100 performed without a flaw. A couple of Pactor QSO's confirmed that HAL finally made this mode run fine as well. RTTY works like magic and pulled out print from signals I couldn't even hear. To make the checkout complete, I hooked up two DSP4100s to each other and had them pump data in 16P4A across the table. Repeating the same test with a PCI4000 and at 8PSM with the P38 showed full compatibility with the existing Clover modems as already anticipated from the on-the-air test.

There are no buttons or controls on the DSP-4100, only 6 LEDs on the front panel that indicate the current status of the unit, telling you if it is ready, calling or linked and when data is sent or received. No little switches to break your fingers and no complicated setup buttons to push in strange order, all is under control of the software and you don't have to worry about it. This unit is true plug and play!

The manual is of excellent quality and details every aspect of using the modem along with ample descriptions of the inner workings of Clover. I am too curious a man not to open up the case and check out the inner workings of the modem. Two screws each on the front and the back of the unit open up the box. After removing two nylon screws that hold the power regulators against the case for cooling a single circuit board slides easily out of the metal case. A quick look showed many similarities to the PCI4000 boards, but there are some important differences. First the flash ROM's that keep the processor code. They are large enough now to store all modes. Second is the Motorola 68000 control processor. Instead of a 8 MHz unit, a 12MHz speeder now forms the heart of Clover along with the DSP56000 signal processor. This adds the power for some future new and clever features HAL may come up with one day. Some additional circuits take care of the RS232 link and there is even a second serial port on the unit that may be used for transceiver control without the need to have two 232 ports on the Computer or laptop.

I will probably use this feature on my Express software in an upcoming release. Talking about Express, the new 3.02 release that should be out by the time you read this of course runs on the DSP4100 as well as on the P38 and PCI4000/M boards. Thanks to the excellent work Drew White of HAL made in developing the serial protocol for the DSP4100, it was a matter of hours to make Express work on the new modem. I am confident that all other software authors will release versions of their programs that support the DSP4100 very soon, as it is very easy to adapt to it.

A nice, top of the line HF modem, highly recommended!

73 Peter TY1PS

The Contest Chair

Hints, Tips, Techniques & Inspiration for better scores

by Ron Stailey, AB5KD

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



Hello Contesters and DXers. It's February already and it's time for the second running of the Digital Journal's WW RTTY WPX Contest. This year should be even bigger than last year. If all our propagation experts are right, the WPX should make a lot of noise. We have lots of Plaques for all categories. Looking back to last year, all of you that won a plaque just may have a collectors item! There will never be another plaque with ADRS on it again. However, this year's plaque will be even better than before. As my dear old Pappy would have said, they are prettier than a speckled pup in a red wagon. Lets all get into the action! I'll see you in the pile!

It time to start making a few plans with Dayton being only three months away. May 17-19 are the new dates for the convention starting this year. We are planning to have the second annual Contesters/DXers dinner on Friday evening again this year. More about that next month. You better start figuring out how to get there on time because it will be one you won't want to miss.

I was re-reading WA7EGA's article in the August issue, just after I ordered my new P38. Hal wrote a review on the New P38 DSP produced by Hal Communications. In Hal's article he said the P38 does CLOVER, FACTOR, ASCII and BAUDOT. It doesn't do PACKET.. I found that very interesting! In honor of such a decision as not putting Packet on their P38 board, I would like to nominate the Honorable Bill Henry K9GWT for the 1996 Nobel Peace Prize. I can't think of a better way to keep peace on the HF bands than NOT putting Packet in your product. In other words JUST SAY NO to HF Packet! You CAN live with out it. Can't we! :-)

Hal also mentioned while testing the P38 he soon got annoyed with the tuning indicator and drug out his old TU-170 just to drive the tuning scope. Finding ways to connect a scope with the P38 has been a subject I've seen on the Internet many times. I may have good news for some of you that don't have all the extra goodies laying around the shack. After returning from Dayton last April, I told Phil Duff NA4M about the new P38 introduced at Dayton. Phil decided he couldn't live without one, so bought a P38 at Ham-Com in Dallas last June. He soon found a way to add a tuning scope. Here is what Phil did to add a tuning scope for his P38..

" I purchased a HAL P38 DSP HF modem card after several years of suffering through chasing DX and working contests on HF RTTY with a PK-232. The PK-232 is a nice piece of equipment but I knew that it wasn't doing as good a job as could be done diggin' out the weak ones. As we all know it has a built in LED bargraph tuning indicator and back-panel outputs to drive a scope for tuning. I used the bargraph most of the time.

I knew that eventually DSP modems would become available at a price I could bear. Enter the P38. I purchased mine directly from Bill Henry at the 1995 Dallas Ham Com convention and during the sale we discussed the lack of oscilloscope outputs on the P38. The P38-Comm software furnished by HAL with the card provides tuning bars on the computer screen as does the latest versions of WF1B's RTTY contesting software. Other soft-

ware that supports the HAL card may also provide some type of on-screen tuning but I've not had an opportunity yet to try them. But, for critical tuning of weak, fading signals, a scope with the crossed ellipses is hard to beat for quick, and accurate tuning.

DSP modems, we must remember have the mark/space filters and detectors implemented in software, not hardware like the demodulators of old. Scope outputs in the older TUs are generally taken from these stages. With the DSP modem there are no filters/detectors in hardware that scope outputs can be picked off from. Bill Henry indicated that additional hardware could have been added to the P38 design to provide scope outputs but it would have driven up the price of the unit. With this in mind I went home clutching my new P38 and thinking of ways to add scope-tuning to my station for use with the P38.

I had laying around for several years an unfinished circuit board project that I thought should fill-the-bill. It was called the "Omni-Shift Tuner" from an article by Richard Nelson, WB0IKN, in QST March 1987 (page 29). I had purchased the bare printed circuit board for the project not long after the article was published but I never completed the project. Now was the time with the new P38 in the shack. I dug out my printed circuit board, which provided the tuning filters and buffers. The original article included an outboard led bargraph tuning display similar to the PK-232. I didn't need the bargraph so it wasn't included in my version of the "Omni-Shift Tuner". I built the needed small +12/-12 volt DC power supply, and added additional controls to provide adjustable filter Q and buffer amplifier gain as mentioned in the original article but not in the instructions provided with the bare printed circuit board.

I boxed it all up into a small aluminum enclosure and cabled it to my old Heath SB-610 monitor scope's vertical and horizontal inputs. It works fine and provides me a nice scope-tuning indicator for the P38. I doubt if bare printed circuit boards are still available since it's been 8 years since the article was published. One of the footnotes to the 1987 QST article mentioned that printed circuit board templates were available from ARRL HQ for those willing to etch their own PC boards. Maybe the templates can still be had. I suppose the circuit could be bread-boarded or wire-wrapped but an etched circuit board sure makes it easier."

73 Phil Duff NA4M

Phil lives in Georgetown Texas about 20 miles north of Austin the state capital. He has worked for IBM for the last 30+ years, as a programmer. He has been licensed since 1970. His first call was WB4TPU until he got his present call NA4M. He is married and has two children and none of the three have the radio bug as yet. He has been active in RTTY since 1972-73 starting with an old military TG7B version of the Model-15 teleprinter. He used the model 32 and 28 KSR before switching over to video RTTY system. He still has the 28 KSR in his garage. He doesn't have the heart to take it to the scrap yard and can't give it away to anyone. Guess they just don't appreciate the fascination of watching those mechanical marvels! But he doesn't miss their noise or size at all.

Towers and Antennas: Phil has one tower—Rohn 45G 73 ft high. With a pair of Hy-Gain TH7DX tribanders stacked at 73 ft and 40 ft fed with a Dunstar Stack-Match box. Both beams rotate, the lower only about 270 degrees South to West. He can select both together or either one alone. For the low bands: A Cushcraft 2 element 40-2CD 40m beam at 80 ft and a full-wave delta-loop on 80/75 fed 1/4 wavelength from apex to provide low angle vertically polarized signal. On 160m he uses the "N4KG Reverse Fed" with 3 elevated radials to load his tower. He hangs out a short (approx 275 ft) unterminated beverage in fall/winter for 80/160 receiving antenna.

Radio's and Amplifiers: Kenwood TS-940SAT equipped with IRCI 2.1khz and 400hz crystal filters, Timewave DSP-9+ DSP audio filter, large home brew antenna tuner. Henry Radio 2K-4 amplifier (2 x 3-500Z).

Computers and TNC's: IBM compatible 486DX33 PC clone with 8MB RAM, 1GB

hard disk, running IBM OS/2 Warp, or IBM PC-DOS 6.1/Microsoft Windows 3.1 as selected by OS/2 Bootmanager. Inside the HAL P38, then a homebrew HAL ST-5 modified with additional op-amps to drive Heath SB-610 for RTTY scope tuning. Plus his home-brew Omni-Shift-Tuner board we talked about at the first of this column which is on a 2nd radio.

Software: RTTY by WF1B for RTTY contests. Phil says, I credit this S/W with renewing his interest in RTTY contesting after being away from RTTY contests for some years. He was tired of hand logging while trying to type at the keyboard. Yech!

Tips, Tricks and techniques: Phil says nothing tricky that he can think of, other than having two rotatable beams. It's nice to be able to beam in two directions for if a weak station calls, you can select the beam he's strongest on and noticeably increase readability by decreasing noise from the other direction.

Favorite Bands: His favorites are 15m and 10m when open, otherwise 20m. He likes these bands because they allow him to hear better with less QRM from stateside stations, and these bands seem to work better in Texas when we have the propagation.

Contests: His favorite digital contest is CQ/DJWW RTTY mainly due to the level of activity worldwide it generates. He likes to operate Multi-Op contests for camaraderie and sharing of operating techniques/experiences, etc.

RTTY Contests Awards:

ARRL'95 RTTY Roundup- 1st SOHP South Texas
 '95 RTTY WPX Contest- 1st North America & USA S.B. 20m
 CQ/DJWW'93 RTTY Contest- 2nd USA Multi/Single @ AB5KD
 SSB Contest Awards: IARU '95 HF World Championship- 1st S/

Op South Texas

CQWW DX Phone '91- 1st USA 5th Call dist. 21mhz
 CQWW DX Phone '90- 1st USA 5th Call dist. 21mhz
 CQWW DX Phone '89- 1st USA 5th Call dist. 21mhz
 ARRL DX Contest '74- 1st S/Op Kentucky Section
 CQWW DX Phone '74- 1st USA 4th Call dist. 21mhz
 CQWW DX Phone '72- 1st USA 4th Call dist. 7mhz

(ARRL DX Phone and CQWW DX Phone '92, M/M form the N5AU superstation. They were the last major M/M SSB DX contests efforts from this tremendous station. Phil said it was a great experience.)

Other awards: DXCC Honor Roll Mixed and Phone- Phil has worked all countries except P5.. WAZ RTTY on 20m in 1976..

Phil also says he has always found operating in mode RTTY being much more "civilized" than SSB especially in contests. With the narrow filtering in the radio's makes for less QRM and more enjoyment.

I want to thank Phil for his help in making this article possible..

Next month: Every October, here in South Central Texas we have a nice get together for Contesters/DXers, called the DX BASH. All this takes place at Bryan Edwards W5KFT's Ranch. It's a rather small ranch for Texas, about the size of the state of RI hi! Last years DX BASH we had several of the new radio's released by: Ten Tec, Yaseu, Icom and Kenwood. We got to play with the, Omni-VI, FT-1000MP, IC-775DSP, TS-870S. Some testing was done by Dan Hearn N5AR, to all of these radio's before the DX BASH. Next

month you can read about the testing of all these new radio's done by Dan N5AR.. I think you will find it interesting..

The next three contests:

Contest	Dates	Start Time	End Time	Operating Time
BARTG	Mar 16-18	0200 UTC Sat	0200 UTC Mon	30 of 48 hrs.
EA	Apr 06-07	1600 UTC Sat	1600 UTC Sun	No off times
SP	Apr 27-28	0000 UTC Sat	2400 UTC Sun	No off times

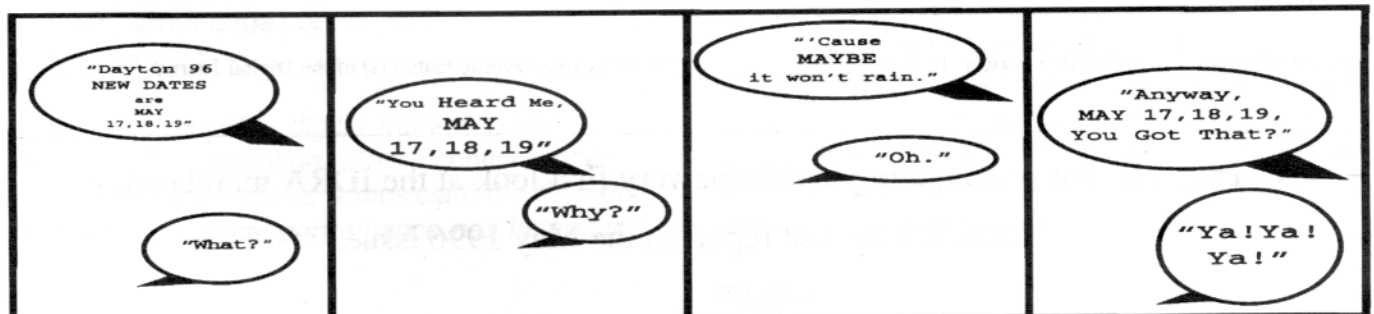
This will be the 3rd running of the SP contest. Normally it's the same weekend as Dayton Convention. Well not any more, Dayton is now in May. So all of us can join in on the action this year.

Until next time,
 73's de Ron AB5KD

"Remember"

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

1996 DAYTON HAMVENTION



Survey of Readers of the Digital Journal

The first ever examination of the talents and capabilities of IDRA members and Journal readers

Please test your memory, complete the questionnaire and send this page (or a copy) to Jim Mortensen, N2HOS, P.O. Box 328, Indian Rocks Beach, FL 34635. The final results will appear in the May issue of the Digital Journal.

- Indicate the year during which you a) made your first VHF/UHF digital contact _____ b) your first HF digital contact _____?
- Tell us the mode used during your a) first VHF/UHF digital contact _____ b) your first HF digital contact _____?
- If you utilize more than one mode at HF, a) during what year did you begin the second mode _____ and b) what mode was it _____?
- If you utilize VHF/UHF digital today, a) what mode do you currently use _____, and b) for what primary purpose _____?
- Tell us a) how many modes you have used on VHF/UHF _____ and b) list them _____?
- Tell us a) how many modes you have used at HF _____?
- Did it include RTTY _____? ASCII _____? AMTOR _____? PACTOR _____? PACTOR II _____? G-TOR _____? CLOVER _____?
- What is your 'primary' or favorite HF mode today _____? What share of your on-air time does this mode command (in percent of all time on the air) _____? What is the 'secondary' mode _____? And what share of time does it occupy _____?
- What is your single most important interest on the HF bands: DX _____? Contesting _____? Random contacts and chatting _____? Scheduled contacts with family or friends _____? BBS activity (either operation or utilization of BBS) _____? Other _____?
- If you are interested in DX, what is your confirmed country count _____?
- How many contests did you enter last year _____?
- What is your favorite contest _____? Why _____?
- What antenna system do you use: beam _____? Wire _____? Vertical _____? Other _____?
- When did you buy your first computer _____? And what type was it _____?
- What kind of computer do you use now _____? How large a hard drive _____? And, how many megs of RAM _____?
- What operating system do you use _____?
- What kinds of software do you use for your digital activities _____?
- Have you ever a) been interested in satellite digital activity _____? Or, have you been active in this field _____?
- Have you run a digital BBS _____? If so, what kind _____? Do you still run the BBS _____?
- When were you first licensed _____?
- Your callsign _____?
- Please rate the Digital Journal (10 = perfect, 1=blah) _____? What is your favorite feature(s) of the Digital Journal _____?

Thanks a lot for participating in this the very first look at the IDRA membership.

Look for the full report in the May 1996 issue.

Greetings from Bob . . .

on board his 34 foot sloop the "Jazzbird"

by Bob Ravenscroft, W7IQO / MM

100 Harbor Dr., #403 • San Diego, CA 92101



. . . So goes my usual greeting on Clover, Pactor, Amtor, or RTTY! When I had my first ham station back in Illinois in 1956, I had NO idea that I would wind up operating digital modes from inside a sailboat! What wonderful surprises life sometimes has in store for us ... I usually operate Clover and Pactor on 20 meters using a Kenwood TS 950SDX transceiver, NYE antenna tuner, Compudyne 486 computer (100Mhz - 750 Megs HD), 14" color monitor with HAL P38 modem and Express 3.01 software. My antenna is the backstay attached to the 50' sailboat mast, with a large copper plate attached to the hull for grounding.

Besides operating the digital modes, I also enjoy straight key CW operation. That I continue operating CW reflects my life as a musician: the rhythmic component in musical performance has helped me

send accurate code with various keyers, especially the straight key. I also appreciate the historical importance and significance of CW to ham radio!

Although my wife and I spent a few years living on the sailboat, we now have a condominium located only 2 blocks from the boat! I must admit, we loved living on the boat so much, we would have continued to do so except for the need for enough space for a nine foot grand piano!! We just couldn't seem to figure out how to fit it inside our 34' boat. Hi!

Hope to have the pleasure of linking with you in the near future using one of the fascinating digital modes. Much of my musical work now consists of digitizing video in a non-linear format created by AVID Technologies, and scoring music using piano and 2 different KORG workstations . . . what fun!

73, Bob

The DX Scene

RTTY DX in the Early '90's - Pt. 2

by Don Hill, AA5AU

P.O. Box 625, Belle Chasse, LA 70037 • e-mail: aa5au@aol.com



The DX scene was in total hysteria at the start of 1993. The famous Romeo of past DX fame was signing P5RS7, supposedly from North Korea on 15 and 20 meter CW. This operation was never accredited for DXCC, and since, has become another blunder for Romeo. Subsequently, Mr. Romeo's operation from Libya (5A0RR) was disallowed. And proof has surfaced in the past year that Romeo's earlier Burma operation (XY0RR) may not have actually taken place from Burma. This operation was accredited by the ARRL DXCC program. What strikes us most about the suspect Burma operation is that it included RTTY. I have not been able to confirm this, but perhaps there has never been a legitimate RTTY operation from Burma, now called Mynamar, ever.

DX Flash from the present! [A message relayed from Martti Laine (OH2BH) in South Korea on the Internet in December 1995, says the XZ1A station is still intact. Another operation is planned for early 1996. I shot an e-mail back asking for RTTY. A reply did not come back before I posted this column. We would hope to see this one on RTTY soon.]

Back to 1993. The Czech Republic was represented on the 3rd of January as a new country by OK1MP on RTTY. OM3LA put Slovakia on digital a few days later. YU7AM kept Serbia represented that first week. A lot was happening. VU7SF showed up from Laccadive Islands but did not bring RTTY!

Other notables on RTTY that January were 7Q7ZZ (Malawi), V73S (Marshall I.), V44KW (St. Kitts), VR6BB (Pitcairn I.), VP8VN (Falklands), and T5/KF6BL (Somalia). To top it off, AH1A from Baker-Howland Island was active on RTTY on the 29th. This was an incredible month for RTTY DXers.

February operations from C31HK (Andorra) and KC6OK (Belau) kept things apace. March included the Kingman Reef DXpedition. N9NS/KH5K showed up on RTTY on the 12th. Gerd, V51GB, made a rare appearance in the BARTG Spring RTTY Contest.

In March, Silvano, KB5GL, and I operate from San Andres Island (HK0) in the Caribbean Sea. I will never forget this memorable experience. I operated RTTY on all bands, including WARC, from 10 to 80 meters. Band conditions were good and the pile-ups were large.

Things got a little more interesting in April. CE0ZIS (Juan Fernandez I.) gets the month off to a good start on the 1st. ET3SID makes his long awaited debut from Ethiopia a few days later. Ron Wright, ZL1AMO, does RTTY from Samoa as 5W1CW. C21/VK2BEX brings another one in from the Pacific on Nauru. Boris, 4N4ENS, comes up on RTTY from Bosnia. It counted as a new RTTY DXCC country. The call soon changed to T91ENS. Despite the war in Bosnia, the hams there have been able to keep the country alive on RTTY. S92ZM was active from Sao Tome.

In June, 4N5GX showed up from Macedonia on RTTY. He was operating 50 baud, but the keen DXers were able to quickly adjust and get this one under the belt. It was Chris, ex-YU5GBC, putting this new country on RTTY. A few weeks later he signs Z32GX. QSL's came quickly. But we haven't heard from

Macedonia lately on RTTY. Other diddles came from ZK1AJJ (South Cooks), ER0TK (Moldova), 4L1BR (Georgia), TF3DX (Iceland), FP/NM7N (St. Pierre et Mequelon), and TL8NG (Central African Republic). Ron Wright operates 3D2RW on Rotuma to end another excellent month on the digital modes.

It got even better in July. Look at this list. FY5FJ (French Guiana), WA2UJH/CY9 (St. Paul), YJ0ARW (Ron Wright again, this time from Vanuatu), T77T (San Marino), 9V1JY (Singapore), JT1CS (Mongolia), XU3DWC (Cambodia), and ZS9A (Walvis Bay) were all active on RTTY in July.

August was also good with E31A putting on Eritrea for the first time ever on RTTY. Gary, W5VSZ, gives out Thailand from the club station HS0AC. KG4CB puts Guantanamo Bay on digital. 9G1XA (Ghana) finishes out the month.

September sees Nepal come up on RTTY as Henry, DJ6JC, joins Baldur, DJ6SI, to activate this rare country as 9N1HL on RTTY, and 9N1SI on CW. RA2FB (Kaliningrad) and AH9B (Wake I.) appear. The Mellish Reef DXpedition comes up on RTTY as promised signing VK9MM. HZ1AB (Saudi Arabia) is a surprise in the CQWW RTTY Contest. 3X0DEX shows from Guinea, but Didier cannot come up with a valid license. Thus, this operation was not accredited for DXCC.

Things slow down only slightly in the last quarter of the year. There is RTTY activity from the following stations: 9U5DX (Burundi), VK9XG (JA3JA on Christmas I.), A61AD (Don, WB2DND at U.A.E.), OH0BBF (Aland I.), 4L8A (Georgia), and XF4CI (Revilla Gigedo). A Bulgarian team sets up from Iran as 9D2UU. They operate RTTY, but do not send in any documentation to the DXCC. TT8OBO has trouble with the ARRL accepting his license for his RTTY operation. It was a hell of a year. The only thing missing was a DX operation from Bob, KW2P on New Years Eve. *Whew again!*

The Former Soviet Union Countries

During all this tremendous digital activity, the USSR dissolves. Even though the breakup of the Soviet Union did not actually create any new countries as far as DXCC is concerned, it is important to remember that including Russia, there are 17 countries that make up that region. Most have changed callsigns in one way or another. Many of the Russian calls have changed as well. For example, the famous contest station UZ9CWA is now signing RK9CWA. The UZ prefix now belongs to the Ukraine. Here is a breakdown of all of the former Soviet Republic countries, their prefixes now and then. This list is based on current and older DXCC listings. As we know from experience, there may be other prefixes for some of these countries that are not shown here. The best way to find out where those stations are located is to get on the air and ask them!

New Prefix

4J, 4K = Azerbaijan
4J1, R1MV = Malyj Vysotskij I.
4K2, UA1, R1FJ = Franz Josef Land
change)

Old Prefix

UD
4J1 (no change)
4K2, UA1 (no

4L = Georgia	UF
EK = Armenia	UG
ER = Moldova	UO
ES = Estonia	ES (no change)
EU, EV, EW = Belarus	UC
EX = Kyrgyzstan	UM
EY = Tajikistan	UJ
EZ = Turkmenistan	UH
UA-UI1,3,4,6 RA-RZ = European Russia	UA1,3,4,6
UA2 = Kaliningrad	UA2
UA-UI8,9,0 RA-RZ = Asiatic Russia	UA8,9,0
UJ-UM = Uzbekistan	UI
UN-UQ = Kazakhstan	UL
UR-UZ, EM-EO = Ukraine	UB, UT, UY

It is plain to see what all the confusion is about. Some of the countries are now using prefixes that used to belong to other countries. Since many of us don't see these countries often enough on RTTY, we don't get a chance to get used to the new prefixes and callsigns. Yet there are several of the countries listed above that show up quite regularly. Then there are others, like Kyrgyzstan (EX), that have been quite elusive. (Last one I need confirmed!)

1996 The Year Ahead

1996 becomes whatever we make it. Sunspots will have a lot to do with it, but it's up to us to get out there and remain active. There's little doubt that this year will be nowhere near what we had in the early 90's as far as DX is concerned. Sunspots dictate the ease at which we can communicate on HF. Of the bands, 10 and 15 meters are the premier hunting grounds when the activity is high to moderate. But the activity is not high now. And hasn't been in the past two years. It will take some time to come out of this sunspot cycle low. There have been fewer DXpeditions recently than in the early 90's. But there always seems to be someone going somewhere regardless of band conditions.

Not everyone gets a chance of going on a DXpedition. I have been blessed with the opportunity to go on six trips that activated RTTY from seven DXCC countries in the Caribbean. Sure, they were not ultra rare countries on RTTY to most in the USA,

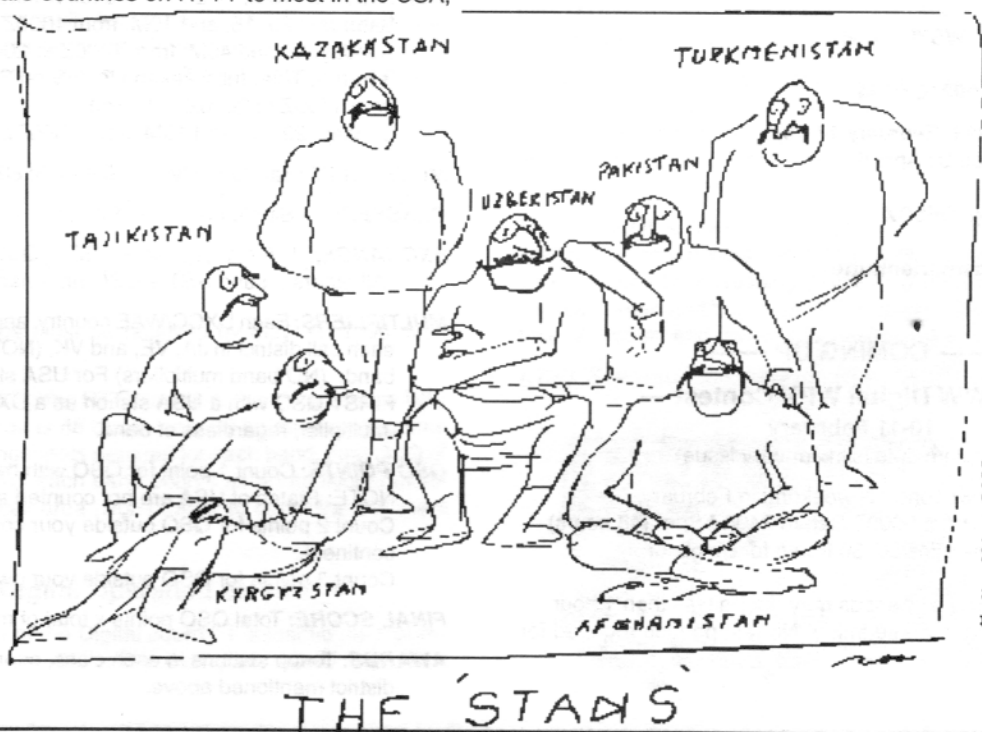
but the digital needs of the entire DX community need to be realized when planning a trip. The survey that was conducted last month should show us what is needed by most. This is important in that some DXpeditioners, including myself, need to know where to go on our next trip.

The *Most Needed List* survey for RTTY was conducted in last month's Digital Journal. It is important that you send in your list. If you don't have a copy of the countries list published for this survey, or cannot reduplicate it (and don't want to tear it out of the magazine!), you can send me an SASE to the address given somewhere with this column, and I will be happy to send you one. If the response is heavy toward the end of the month, I will hold off sending the results to Jules for a few days. I'm still hoping to get the results ready for the March issue. This information is greatly needed for future digital operations from DX locations. I can also fax the survey countries list to you if you are in the USA. Let's let everyone know what we need. It will help.

DX Flashes! Ron Wright, ZL1AMO, announces his involvement with the ZL8 (Kermadec I) DXpedition scheduled for May 1996. Let's hope he has gotten his KAM fixed! Ted, LZ1WR, hopes to activate 5A1A in March. Let's not let him go without RTTY gear. Mark, ON4WW, who was signing 9X/ON4WW has received his new call and is signing 9X4WW. Samuel, F5IJT, and Jean-Jacques, F5SZK, were to arrive on Crozet I. in December '95. They will be there for one year signing FT5WE and FT5WF. They hope to be active on RTTY. Hot off the presses. Wake Island (KH9) will be active this month, January 24-31, by team consisting of AL7EL, WB2DND, KC7V, and K4HQI with a "major emphasis on RTTY". The callsign will be released just before the operation commences to reduce the threat of pirates. See you in the pileups.

He's BACK! In early Dec. '95, I worked Jules, W2JGR, on 20M RTTY. He had just finished working a station in the Falkands. He told me he hopes to be back next month. It sure was great seeing his print come across the screen again. I want to thank the Digital Journal for allowing me to be included in their excellent publication. It has been fun reliving the explosion of RTTY DX'ing. And it's only going to get better. *WHEW!!!*

73 de Don/AA5AU



Contesting & Special Events

The latest & greatest digital contesting news

by Rich Lawton, N6GG

14395 Bevers Way • Pioneer, CA 95666



— RTTY Contests - Coming Events —

Date:	Contest:
FEB 10-11 '96	Dig. Journal WW Digital WPX (USA)
FEB 17-18	DARC HF RTTY, Part I (German)
MAR 16-17	BARTG Spring RTTY (English)
APR 6-7	EA WW RTTY (Spanish)
APR 27-28	SP DX RTTY (Polish)
MAY 11-12	VOLTA RTTY DX (Italian)

NOTES: Two major contest changes were brought to my attention in late November.

- **EA WW RTTY Contest (April 6-7)** will now count CQ Zones as multipliers. Previously Zones were just part of the exchange, not counting as mults along with DXCC countries and Spanish provinces. Counting Zones should greatly increase WW participation.
- **DARC Corona 10M Digital** has been discontinued. It occurred 4 times a year, in March, July, September, and November. Due to poor propagation conditions that occur on 10M during low sunspot times of the 11 year cycle, contest participation was quite low.

— Reminders for Logs —

ARRL RTTY Roundup (January 6-7)

Logs must be postmarked before February 5th.

Mail logs to:

ARRL RTTY ROUNDUP
225 Main St
Newington CT 06111

DJ WW Digi WPX (February 10-11)

Logs must be postmarked before March 13.

Mail logs to:

Jay Townsend WS7I
Box 644
Spokane WA 99210-0644

DARC HF RTTY, Part I (February 17-18)

Logs must be received by April 5.

Mail logs to:

Werner Ludwig DF5BX
Box 1270
D-49110 Georgsmarienhutte
GERMANY

— — COMING UP — —

— DJ WW Digital WPX Contest —

10-11 February

(Complete details in January issue)

CONTEST PERIOD: Second full weekend in February,

Ref: WS7I, AB5KD - from 0000Z Sat. to 2400Z Sun. (48 hours)

- Max. operating time allowed: 30 hours for Single or Multi-single op.
- The 18 hours of time off periods may not be less than 1 hour each, and clearly marked in log. No rest periods required for Multi-multi ops.

MODE: Any digital, but no cross-mode.

BANDS: 80, 40, 20, 15, and 10M

CATEGORIES: 1. Single op, hi power
a) all band
b) single band

2. Single op, low power
a) all band

3. Multi-op, all bands **NOTE: Spotting assistance, such as Packet Spotting Nets, is allowed in ALL categories.**

EXCHANGE: Send RST + QSO number (starting with 001)

- Multi-op stations use separate QSO number sets for each band.

MULTIPLIERS: Each new prefix QSOed, regardless of band. (NO band mults)

QSO POINTS:

- On 20, 15 and 10M: 1 point per QSO with your own country, 2 points per QSO with country on your continent, and 3 points for the rest.
- On 80 and 40M: 2 points per QSO with your own country, 4 points per QSO with country on your continent, and 6 points for the rest.

FINAL SCORE: = Total QSO points x total number of prefixes.

LOG DEADLINE: Must be postmarked within 30 days of contest.

COMMENTS: Same station may be worked on different bands for QSO points. Has low power category. NO band mults. Has bonus points for low bands.

— DARC HF RTTY Contest, Part I —

17-18 February

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

CONTEST PERIOD: • Part I: Third full weekend in February on

Saturday: 20, 15, and 10M: from 1000Z to 1600Z (6 hours)

Sunday: 80 and 40M: from 1400Z to 2000Z (6 hours)

• Part II: Third full weekend in July on Saturday: 80 and 40M: from 1400Z to 2000Z (6 hours)

Sunday: 20, 15, and 10M: from 1000Z to 1600Z (6 hours)

MODE: RTTY (Baudot) only **BANDS:** 80, 40, 20, 15, and 10M

CLASSES: A - Single op B - Multi-op C - SWL

EXCHANGE: USA stations: send RST + QSO nr. + name + State
All others: send RST + QSO nr. + name

MULTIPLIERS: Each DXCC/WAE country, and each USA state, and each call district in JA, VE, and VK, (NOT USA), regardless of band. (NO band multipliers) For USA stations, count only the FIRST QSO with a USA station as a DXCC/WAE country multiplier, regardless of band.

QSO POINTS: Count 1 point for QSO with own country.

NOTE: States of USA are not counted as countries.

Count 2 points for QSO outside your country but within continent.

Count 3 points for QSO outside your own continent.

FINAL SCORE: Total QSO points x total of multipliers.

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

LOGS: Logs must contain: Date, Time UTC, Callsign, Message sent/received, name, US-State, first-time-multiplier, and QSO points. Also required is a Summary sheet with a list of claimed multipliers. If entry is multi-op, please list names and callsigns of all ops. Comments are very much appreciated.

DEADLINES: Part I: May 1st. Part II: September 1st.

Mail entry to:
Werner LUDWIG, DF5BX
P.O. Box 12 70
D-49110 Georgsmarienhutte
GERMANY

COMMENTS: There are 2 distinct contests here: Part I is in February and Part II is in July. Each part is identical except for the date, and the bands to operate on. In addition, each part is divided into 2 distinct time segments, each 6 hours long. The "Saturday segment" of Part I is for operation on 20, 15, and 10M, and runs from 1000Z to 1600Z. The "Sunday segment" of Part I is for operation on 80 and 40M, and runs from 1400Z to 2000Z. Part II, in July, reverses the band operation for Saturday/Sunday segments. Got that? GOOD!

NOTE: There are no multipliers for USA call areas. Just STATES count for mults. Also, NO band multipliers. This means that only your FIRST USA QSO in the contest will count for a DXCC/WAE country mult, along with the State mult.

— BARTG SPRING RTTY — 16-18 March

CONTEST PERIOD: Third full weekend in March
Ref: BARTG, G4SKA from 0200Z Sat. to 0200Z Mon. (48 hours)

- Maximum operating time allowed: 30 hours for single ops and SWLs.
- The 18 hours of rest periods may not be less than 3 hours each.

MODE: RTTY only

BANDS: 80, 40, 20, 15, and 10M

CLASSES: 1) Single op, all band 4) Multi-op, multi-transmitter
2) Single op, single band 5) SWL
3) Multi-op, all band

EXCHANGE: Send: RST + QSO number + Time in UTC

MULTIPLIERS: Each DXCC country, including first QSO with W, VE, and VK, counts as a multiplier on each band. Each call district in W, VE, and VK counts as an additional multiplier on each band. (Band mults) Also, each continent (6) will count once, not once per band.

QSO POINTS: Count 1 point per QSO.

- Note that stations may be contacted again on other bands.
- Duplicate QSOs on same band do not count and must be clearly marked.

FINAL SCORE = Total QSO points x total mults x number of continents.

LOG DEADLINE: Logs must be received by May 31, 1996. Mail logs to: **G4SKA**.

COMMENTS: BARTG Spring RTTY is one of the more popular WW contests. Contest period is 48 hours long, 30 hours operating time is allowed. Separate logsheets required for each band. First QSO of each W, VE, and VK on each band counts as an additional multiplier, along with that call area. Don't forget to count the continent multiplier bonus.

— RTTY/Digital Operation on 40M —

Back in April '95 issue of the Digital Journal I unloaded my frustrations about operating on 40M RTTY during the ADRS WW WPX

Contest. I concluded that, "RTTY is not welcome on 40M. There's no universally approved space allotted for RTTY." I mentioned numerous chaotic occasions where, in attempting to QSO RTTY DX stations calling CQ, I was virtually QRM'd off the frequency by irate CW and SSB operators.

Well, I see in the January '96 QST editorial "It Seems to Us..." Dave Sumner, K1ZZ, stated (on page 9) that, "...RTTY DXers have no where else to go (on 40M). With RTTY DXing and data modes growing in popularity, what was an occasional irritant has grown into a major concern for those affected."

He goes on to state various international conflicts of space allotments on 40M between CW, QRPers, foreign SSB, and SW AM broadcasting, along with the digitals. His most discouraging point: he states that nothing much can be accomplished until the WRC (World Radio Conference) happens in 1999.

In the meantime, what can we do? 40M seems to be the most reliable, consistent, band, and has the best propagation during the evenings. 20M now folds as the sun sets. 15M and higher are not reliable during the day, and dead at night. We need evenings and late night activity to keep 40M AND our digital hobby active, as most of us are busy or have jobs during daytime hours.

Something should be done with 40M - and soon - before 1999.

Here are some ideas to consider to save 40M:

- Start up "beginner's nets" to help master the various digital modes. With all those multi-mode controllers out there, perhaps some regular evening sessions can be instigated to inspire digital ops to try their "other mode" capabilities. Skip distances and multi-path are not near as bad as 80 and 20M.
- Short 4 hour 40M sprint contests like the popular 4 hour TARA RTTY Sprint. If we had one, say, every Wednesday evening, with a "How'd ya do?" net afterward, that should help spur 40M digital activity to new heights.
- Attempt other **narrow band digital modes** for contesting on 40M, such as ASCII or FEC (NOT Packet!). ASCII and FEC modes use higher baud rates than RTTY and should be very interesting. (Higher QSO rates?) We could prove whether or not FEC (Forward Error Correction) codes are more efficient. Also, there's no reason we have to stick to 45 baud for RTTY. How about trying 75 or 100 baud? It could be another international item for ARRL to present to the WRC in 1999, too, if we had some correlating data to show. Notice that W1AW "Teleprinter transmissions" are sent at 45 baud, AND 100 baud FEC, AND 110 baud ASCII.
- We need more comparisons on how static crashes effect data thrupt on various digital modes. One way: try 4 hour sprint contests while changing data rates and/or modes at each hour. 40M would be the ideal band for this. It would be fun, and it would be an interesting challenge!

Think about this: If we can instigate a significant increase in use of 40M digital frequencies - say from 7060-90 kHz - it would show a genuine need for increasing digital frequency allocations on 40M - the real "bread and butter band" for future operating during evening time. We could end up actually having a home on 40M!

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

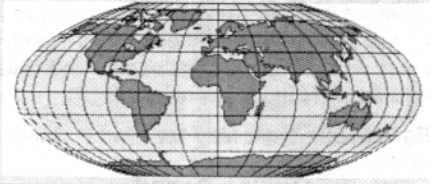


The International Scene

A regular look at happenings from around the digital globe

Received from various sources

Edited by Jim Mortensen, N2HOS



VK/VK/VK/VK

SAD NEWS! Bill Storer, VK2EG, telephoned Angelo, W5KSI, today Friday 29 December that Sid E. Molen, VK2SG succumbed to a heart attack Friday morning Australian time. Sid was 76 years old and had been in poor health since 1993. Sid, along with Bill, VK2EG, was a co-founder of the Australian National Amateur Radio Teleprinter Society (ANARTS) in the early 1970's. They subsequently started the weekly RTTY DX Notes, which were renamed the VK2SG RTTY DX Notes, in 1993, when Sid had to relinquish his contributing efforts to others.

Sid's by-line on the DX Notes was 'DX1', a sobriquet he earned by having received the first RTTY DXCC in Australia. An autobiographical sketch of Sid was the featured cover story of the RTTY JOURNAL of March 1989. A subsequent follow-up appeared in the DX NEWS column of the RTTY DIGITAL JOURNAL of September 1993. The VK2SG RTTY DX Notes will continue to be generated by the present group of rotating editors, I5FLN, WB2CJL and W2JGR.

Sid Molen will be sorely missed. Rest in Peace old Buddy.

From his friend and colleague Jules W2JGR

TY/TY/TY/TY

E-Mail comments from TY1PS

The last couple of days I found the time to look a bit around the bands to see what's up and what's new. What a pleasure to see so many new Clover stations on the air! Even as recently as a couple of months ago, I could call CQ on 65.5 for the whole weekend and get nothing but the same handful of stations. What a joy to see these many stations no on the air now. But as nothing in this world is easy, it seems some of the newcomers have a bit of a hard time to mastering the new mode.

Please allow me to give some hints to those who newly joined the fun. I am known to be nasty at times . . . but please don't take anything personally!

1. POWER

Wow more power more speed! That maybe right for a Porsche but not for Clover. If you have a BIG or even a small amplifier then SELL IT! You will not need it so buy a nice Pentium with a perfect Super VGA and an image scanner instead! You are so proud of you FULL LEGAL POWER ? You will be even prouder of the nice new computer you can buy with the cash! Muscle men are out, the girls seek the smart guys these days!

In fact, I watched several stations on 65.5 running big signals . . . boys (and I hope girls) and that's overkill! Clover is a LOW POWER, small bandwidth mode. With overdriven signals you create a signal that can be heard all over the band and cause QRM as far down as on 064. You create QRM for other users up and down the band. Give it a try. Switch OFF the amp, reduce power to 10 watts and see. Clover runs just as fine, probably even faster! I've run Clover here since 1992 and never with more than 50 watts, typically 10 to 20, and I never missed my daily sked with N2HOS.

2. TUNING

Clover is not as delicate on tuning as many think. You can well keep a link up and running with 20Hz frequency error. Even with 30Hz error you are still in business. Refrain from the temptation to tune it to 0Hz error all the time. Each time you change the dial, Clover will have to readjust and you actually slow down that way. Thus, let it link first, then when the text starts to flow and you are more than 20Hz off adjust once. I found the up and down buttons on the mike to be useful for that instead of the main dial.

3. USE THE NEW FEATURES!

Express will do plenty of new things that you never even thought of in other modes. Don't hang around sending your station description (who the hell cares) and weather reports (its always 30C and sunny here, that's the last time I will report!). Do the fun things instead. Hit the sketch button and make a funny painting of yourself: It will go across the link instantly! Have a nice photo somewhere? Scan it in and send it to the other side of the link. No scanner? Boy a handy scanner is less the \$150 these days. I bet the guy on the other side will enjoy a picture of your latest girl friend much more than a description of the guy wire sizes you used to build your tower. You found the funniest shareware game in the world? Hit the button and send it out to the other side of the link! Boys and girls, the bandwidth is there. Clover is fast, but only if you use it. Don't let it sit in BPSM and exchange the same old brag messages you made up for RTTY when you started that 25 years ago.

4. 65.5 BUSY??

Where is the problem? I don't get the point of all the discussion. Find a free spot, call CQ and you will get a reply. That concept of a calling channel didn't work with AMTOR years ago . . . it won't do on Clover either! The times when there were only a handful of Clover stations around needing a channel to find each other are over. We are all free to use any mode and we have no special channels reserved for Clover. I gave up the illusion that anybody will listen before calling a BBS years ago. Be realistic, nobody does that. The same guy who complains about a Pactor coming up on top of him will do the same to somebody else five minutes later. I've see that too often to listen to such a discussion anymore.

The only solution is to spread out on the band. Use Clover wherever there is space, as all the other modes do as well.

Finally the **BIG** question!

Is there any YL or XYL on Clover ?????????????? Who has spotted one? I hereby sponsor a trophy for the first YL to YL only Clover QSO to take place! To be given at the Dayton 96 Dinner! (Right—it takes two YLs for that hihi).

(Note: thanks Peter. Please see my comments in the Last Word—ed)

VK/VK/VK/VK

More advice via a bulletin captured by Andy G3ZYP

From: VK5RQ—TOR CONNECT HINTS

HI ALL,

Thank you for reading this bulletin...

The name here is Joe VK5RQ sysop of VK5RQ TORBBS on 20m

14.081 LSB, I have been running that BBS for about 3 years now in all. I sit in my shack for hours day in day out, and watch lot of stations

connecting. They leave messages to be forwarded to friends via the VK5 packet and 'satgate' packet network and also leave and read bulletins with a lot of success. But I am afraid that some stations do not have much success for various reasons. It may be no one's fault, just a bit of miscalculation in propagation. The biggest problem though is frequency synchronization. They are off the frequency and not much happens.

Now I am going to pass few hints, not to be smart for I am no more an expert than you. But it may help others or new comers to these wonderful modes in amateur radio (TOR MODES = AMTOR PACTOR GTOR). And perhaps the interest in them will continue to grow very fast and will be great as propagation improves.

#1. Make sure that you are not getting RF feedback either into your transmitter or into your TNC (MODEM). The best way to know about that is either have another rig or scanner on a dummy load and listen to your own sig. Or, have a Power SWR meter in line, and watch the power needle which must be in full deflection on transmit. You must not to have a lot of movement up and down but have full deflection at all times..

#2. This is a simple mistake that I cop a lot, and I am sure others do the same as me. After I have a phone QSO I move the IF shift or put the notch filters on, or I have the RIT on, and of course I forget it. Then I go on the digital mode to connect to a BBS and I wonder why I can not connect or why data is flowing very slowly. Always make sure, before issuing a connect that your TRANSMITTER is on the normal standard settings..

#3. The final one, most TNC have LEDS to give you an indication that your system is locked and synchronized with your connected station. Take KAM's TNC for instance. They have green LEDs and on a good connect you must have to 2 green LEDs on each corner of the window bright. On pulses have no other LEDs lighting up next to each of them if it is possible. I am sure that other TNC have a similar indication.

Hope that helps you and me to have better enjoyable TORINGGGGG
>----->>>

73's to all....

Best Regards JOE VK5RQ@VK5RQ.#ADL.#SA.AUS.OC

DL/DL/DL/DL

I've just installed the latest version of World Wide Link for Windows. It is a most impressive and user-friendly program. Out of choice I always have opted for DOS based programs but I must say WWLink for Windows has changed all that. I look forward to using the many interesting facilities the program has to offer. In fact within 30 minutes of loading the program and not even looking at the HELP facilities I was sending a .ZIP file in a binary transfer on 80M through quite appalling jamming type QRM.

I'm now going to really study the extensive and good on line HELP that has been prepared for the program by my buddy Geoff, G3MWH. This for sure is one program I'm really going to get to grips with and get the full benefit of what it has to offer.

More to follow, 73 de Andy G3ZYP

+++++ A NEW Windows-Program for
ALL SCS/PacComm PTC Series +++++

WORLD WIDE LINK FOR WINDOWS
- by - Paul Harrison - DJ0CU

WWLINK.EXE

Due to widespread use of Microsoft windows and its use in many ham shacks and the advanced state of development software for same, it was decided to write a sophisticated program with extreme ease of

use for the above units. However the program should also be able to be used on other TNC's. Over a period of 18 months with the help of several hams as beta testers, in particular Wilfried Max DL1XAM and Geoff Jennings G3MWH a DOS version was developed which met the above criterion. This has since found its way in many ham shacks and has proved very popular.

Using the DOS version as template the program was moved to a Windows platform using the highly successful programming tool Visual Basic for Windows. This required a time span of about six months.

The resulting program has met all the criteria the author set, and a program has emerged which is very sophisticated, yet extremely easy to use. No manual is required, although a comprehensive on-line help

is included in the program. A separate Windows help file will belater available which will cover all aspects in detail.

Here is an overview of the main functions, not necessarily listed in order of importance:

Text functions:

- Binary Transfer
- ASCII Transfer
- Automatic 7plus extraction with filenames.
- 15 k keyboard buffer (first in first out FIFO)
- 6 K "Flashbuffer" (FIFO) allows immediate back scroll of received text.
- 3 MB total text Buffer, saved in 100 text files of 30k each.
- Normal windows Clipboard functions for all received and transmitted text.
- Own comprehensive internal program editor.
- WWL SPELL. Dynamic on-line dictionary, which can be customized.
- Single keystroke inserts word if required in outgoing text.

Screen functions

- RX/TX Screen size and color, user adjustable.
- Dynamic indication of PTC status on screen.
- 3D graphic of PTC status and link quality.
- Three floating clocks can be permanently displayed in custom locations.
- Offset from GMT and names can be changed at any time.
- Clocks appear automatically on program start if required.

Scanning functions

- Incorporates the ability to scan Yaesu and Kenwood rigs with the appropriate interface.
- Each band can be individually programmed with 10 different frequencies.
- Automatic band change can be selected for any time period in 24 hours .
- Program can go into automatic scanning on desired freq/band on start-up.

Transceiver control functions

- N-LINE frequency Pad can be activated which is always on TOP of Screen.
- Separate screen to control transceiver with mouse or keyboard.
- Sophisticated scanning functions.
- Frequency database for mouse click setting up of favorite frequencies.

Logbook functions

- A fully automatic logbook for Pactor and semi automatic for Amtor/Rtty.
- All log entries can be edited, searched, etc.
- On connect the time and date of last contact, plus name, is shown for duration of QSO.

Other functions

- Setting of GMT offset.
- Automatic extraction of callsign from stations calling CQ
- Automatic conversion of Pactor call to Amtor call.
- Remote Down-loading of Binary and ASCII files.
- Remote access for listing directories, file names, etc.
- Freely programmable connect and qrt text.
- TNC commands freely programmable if required.
(to control other tnc's)
- Picture pasting from Clipboard
- Upper/Lowercase.
- ROBOT facilities, allows for automated transmit on connect.

A demo version can be obtained from any of the next 3 stations, by sending a formatted 1.44Mb diskette with return postage and a self addressed envelope.

Germany:

Wilfried Max DL1XAM
Lis_bett_Bruhn str. 18
21035 Hamburg Tel/Fax 0049 40 7353335

Rest of World:

Paul Harrison DJ0CU /Ex G4ADF
Villa Alliki
49100 Afra
Corfu /Greece Tel. 0045 40 28 46 95

These digital mailbox stations in Asia and Oceania operate 24 hours a day (unless noted) on the mark carrier (LSB for Clover) frequencies listed. Other directories are published for different parts of the world. A full directory can be obtained from the Digital Journal Disk Library.

9M2DD Devan in Port Dixon, Malaysia (.MYS.AS) PLX
P 7030 (0000-0600z)
P 14074 (0900-1800z)

9M2KN Doctor Ken in Johore Bahru, Malaysia
P 14072.5

9M2RS Abdul in Kuala Lumpur, Malaysia
P 14074.5

BV5AF Bolon in Taiwan (.TWN.CHN.AS) APL/RLI
A 14069 14072 14075 14077 14079 21070 21072 21076
C 14066 21066

BV5AG Katy in Taiwan (.TWN.CHN.AS) APL
A 28081

BY1QH Tsinghua University Amateur Radio Club, China (.CHN.AS)
AP 14072

DU1AUJ Lynn in Quezon City, Philippines (.SCAN.PHL.OC) APL
A 14070 (1300-2300z), 21070 (2300-1300z)

DU9BC Fred in Davao City, Phillipines (.DVO.PHL.OC) APL
A 7012.8 (2300-1000z), 14072 (1000-2300z)

FK8BK Louis in Noumea, New Caledonia (.NCL.OC) Win
A 14066 (0700-1300z)
C 14068 (0700-1300z)
QRT Dec-Feb

FK8GM Eric in Noumea, New Caledonia (.NCL.OC)
PG 14072 (0100-0500z)

HS0AC Ray in Bangkok, Thailand (.#APL.THA.AS) Win
AP 14069.5
X 21111

HS1ASC Thida in Thailand
P 14.072.5

JA1JTA Mike in Sagamihara, Japan (.JPN.AS) APL
A 14070 Sat/Sun only

JA3FJ Goro in Chiba, Japan (.JPN.AS) PLX
AP 14071 14072 14074 14076 14078

JA5TX Mitsuo in Kochi, Japan (.JPN.AS) PLX
AP 14071 14072 14074 14076 14078

JR3TMW in Japan
P 14072

S21A Saif in Dhaka, Bangladesh
P 14072.5

VK2AGE Gordon in Lismore, Australia (.#NE.NSW.AUS.OC) Win
AP 7045 10109 10127 14075 14077 21076
C 7047.1 10111.1 14077.1 14079.1 21078
NA 0000-0600 1030-1130 2330-0000z AF 0600-0700 1530-1600z
EU-AS 0830-1030 1130-1530 1600-2330z EU Long Path 0700-0830z

VK2DW Don in Kempsey, NSW, Australia (NSW.AUS.OC) Win
P 14070 (0300-2000z)
A 14070 (2000-0300z)

VK2EHQ Peter in Kulnura (Sydney), Australia (.NSW.AUS.OC)
APL
A 14070.5

VK2FPV Paul in Sydney, Australia (.NSW.AUS.OC) APL
A 21069 (weekends)

VK3WZ John in Melbourne, Australia (.VIC.AUS.OC) Win
P 14071 (2230-1230z)

VK5RQ Joe in Adelaide, Australia (.#ADL.#SA.AUS.OC) KAM
APG 7030.5 14080

VK6PK in Australia (.#WA.AUS.OC) Oth
A 14075.5

VK6TN Ernie in Glen Forrest (Perth) (.#WA.AUS.OC) APL
A 14070 14071 14081 21071 21079
VK/ZL 0100-0400z JPN/KOR 0700-0900z NA 0900-1400z EU 1400-0100z

VU2/LA9PF Cato in Noida (New Delhi), India (.DEL.IND.AS) Win
AP 14079 (1200-0300z), 21079 (0300-1200z)

VU2DPG Dieter (QRT 8/95, VU2/LA9PF succeeds)
mail to: VK3WZ.#VIC.AUS.OC

ZK1DB Arnold in Rarotonga, Cook Islands (.CKI.OC) APL
A 7045 (1700-2000z) 10128 (2000-1000z)

ZL2AMD in Napier, New Zealand (.#40.NZL.OC) MSY
P 7028.5

ZL2ALW in Pongaroa, New Zealand (.#54.NZL.OC) FBB
X 7035.5 7038.9 10.144.6

ZL3MA Graham in Geraldine, New Zealand (.#87.NZL.OC) MSY
P 7028.8 7047 7072 7073 (0400-1900), 10109 10127 (0400-0700)
P 14067 14068 14069 14077 14079 14116 (1900-0700)

Please send comments/changes to WA8DRZ.

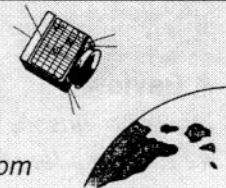
(Note: thanks to Craig and Frank WA1URA for this up-to-date information—Ed)

DIGITAL SATELLITES

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

by David Medley, KI6QE/VK2IMJ

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



Latest List of Satellites and Frequencies

My thanks to Richard, G3RWL and to AMSAT for the following information.

This list contains information on all the present active amateur satellites. Most of them have been covered and explained in previous articles. I have attached some notes on those that have not been covered. Keep this list by you in the shack because there are too many frequencies and details to be memorized.

Satellite	Uplink	Downlink	Beacons	Notes
OSCAR 10	435.025-.175	145.830-.98	145.81/.987	
OSCAR 11		145.825	435.025/2401.5	UOSAT-2
OSCAR 13	435.425-.575	145.825-.975	145.813/.985	Mode B
OSCAR 13	435.603-.639	2400.711-.747	2400.664	Mode S
OSCAR 16	145.90-.96	437.051	437.026/.051	PACSAT
			2401.221	
OSCAR 17		145.825	2401.221	DOVE
OSCAR 18		437.102		WEBERSAT
OSCAR 19	145.84-.90	437.126	437.126/.154	LUSAT
OSCAR 20	145.90-.146	455.80-.90	435.797/.91	FUJI
OSCAR 22	145.90-.975	435.120	435.120	UOSAT-5
OSCAR 23	145.850/.90	435.175	435.175	KITSAT 1
OSCAR 25	145.87/.98	436.50	435.175	KITSAT 2
OSCAR 26	145.875/.90/.925	435.822	435.867	145.950 also
OSCAR 27	145.850	436.797		AMRAD
RS 10	145.860-.900	29.36-.40	29.357/.403	Mode A
	21.16-.20	29.36-.40	29.357/.403	Mode K
	21.16-.20	145.86-.90	145.857/.903	Mode T
RS 11	145.91-.95	29.41-.45	29.407/.453	Mode A
	21.21-.25	29.41-.45	29.407/.453	Mode K
	21.21-.25	145.91-.95	145.907/.953	Mode T
RS 12	145.91-.95	29.41-.45	29.408/.454	Mode A
	21.21-.25	29.41-.45	29.408/.454	Mode K
	21.21-.25	145.91-.95	145.912/.959	Mode T
RS 13	145.96-.146	29.46-.50	29.458/.504	Mode A
	21.26-.30	29.46-.50	29.458/.504	Mode K
	21.26-.30	145.96-.146	145.862/.908	Mode T
RS 15	145.85-.89	29.36-.40	29.353/.398	Mode A

Oscar 10 is the oldest of all the satellites and still working. Its batteries are dead and it is only workable when in sunlight. If you hear it and the signals are FM or unstable please do not try to use it. Oscar 10 is good for analog modes. No FM, packet or RTTY please.

Oscar 11 is an experimental and educational satellite with no uplink capability available. It requires special software and hardware to demodulate the downlinks.

Oscar 13 has similar capabilities to Oscar 10. It is due for re-entry and death late this year. It will be interesting to follow it during the coming months and to watch the decay of the orbit.

Oscar 16 and 17 are the PACSATS which have been explained in previous articles.

Oscar 18 is WEBERSAT which is mainly used for taking photographs. I hope to cover this in a future article.

Oscar 20 is the Japanese FUJI. This satellite has a neat packet mailbox but due to power problems this is not always available. Otherwise FUJI can be used for analog modes.

Oscar 22 is a 9600 baud packet satellite used mostly to support the Satellite Gateway Program.

Oscar 23 and 25 are the KITSATS both having 9600 baud mailbox capability.

Oscar 26 also known as ITAMSAT is an Italian project with characteristics very similar to the PACSATS.

Oscar 27 also known as EYESAT-1 has both amateur and experimental payloads on board. If you have any special interest in this one you can contact:

AMRAD BBS at 703 734 1387

RITTY - An Innovative RTTY Modem

A Review

by Glenn Vinson, W6OTC

#2 Embarcadero Center, #1660 • San Francisco, CA 94111 • Internet: mgvinson@crl.com

Just as digital signal processing has begun replacing whole sections of receivers, especially in commercial gear, we are now seeing DSP beginning to make a significant impact on amateur radio digital communications technology. While HAL has placed DSP technology on its PCI-4000 and P38 HF modem plug-in boards, Brian Beezley, N6STI, has written a program that, for \$100, eliminates the need for a dedicated HF modem altogether, in favor of using the processing power of a 386 or faster PC with a math coprocessor, VGA, a Creative Labs Sound Blaster 16 (or Vibra 16) card and his proprietary software filtering and signal processing algorithms. Only 2 wires run between a transceiver and the Sound Blaster card: audio out, preferably from some fixed level source such as a recorder output, from the receiver to the Sound Blaster's line input jack, and audio in from the card's output jack to the radio's mike or phone patch input. Place the rig in LSB mode, adjust the VOX to respond properly to the AFSK input level and RITTY is ready for action.

When RITTY is started at the DOS prompt, the terminal program begins to print copy immediately. Since the incoming signals are being processed by the Sound Blaster and the RITTY software, there is no wait for hardware initialization. Three graphs are displayed along the bottom of the screen, showing different aspects of the received signal in real time. In my view, the most important is the spectral tuning indicator, a horizontal bar labeled 170 Hz with two vertical bars showing the proper location of the mark and space signals. Tuning the RTTY signal to correspond with these marks is a very accurate method even for very weak signals. Those of you with Sound Blaster cards may already have tried a similar display available with the Spectra Plus software running under Windows. I have found this type of display to be the most accurate—and easy to use effectively—of any tuning method I have tried.

The second display shows signal strength and is important in indicating the level of signal going to the board. Input and output gain are software controllable and one must be careful not to clip the A/D converter in the card on signal peaks.

The third display is a fascinating depiction of the demodulated mark-minus-space baseband signal being received. One useful piece of information this display indicates is the character length being generated by the other station. The standard length for 45-baud RTTY with a 31-ms stop bit is 163 ms, but the character length actually generated by various HF modems commonly used by amateurs varies considerably from this standard.

Generating these real time displays consumes some computer processing time, but this is significant only with 386 machines. Either the tuning indicator or the signal display (or both) may be removed from the screen if required.

In the terminal program, commands are accessible by simple keystroke and menus. All standard RTTY options are available, plus some that are not standard but are very useful. For example, isolated line feeds (i.e., those not followed by a CR) can, if desired, be ignored since line feeds are rarely generated in-

tionally without a carriage return. More interesting is an option to display symbols for control codes (CR, LF, LTRS, FIGS) that are not printable. You may be surprised at the redundancy used by bulletin stations like W1AW to deal with atmospheric noise bursts as well as the rather odd and inefficient pattern of keystrokes employed by some people you work. This information is normally suppressed at the TNC level by the multimode modems and simply not available to other terminal programs. Another excellent feature is an option to print both cases (LTRS/FIGS) simultaneously on 2 different lines. When working DX or other weak-signal stations, this feature can really help decode the message if the modem misses the shift signal during a fade or as a result of QRM.

Another option turns the numerical flywheel on and off manually if desired. The theory of the numerical flywheel as a method of creating a pseudo-synchronous "lock" on the start bits being received was described in the November issue of the Journal by RITTY's author, Brian Beezley, in an article entitled, "The Importance of Using Diddle on RTTY." I will not repeat the substance of that article here but I suggest you reread it because it makes several important practical points that are applicable generally about the use of diddle beyond acting as a "hook" for the numerical flywheel to follow. Where the sender is operating from the keyboard, rather than using macros or a transmit message buffer, the flywheel is unlikely to be helpful, even with diddle on, because most amateur radio operators type with an uneven rhythm. But when copying text sent from a message buffer or in ARRL bulletins, the numerical flywheel works very well.

By its nature the numerical flywheel is not useful in the absence of diddle or where the diddle cannot be followed (for example with very weak signals that fade into the noise, or through heavy QRM). To copy through selective fading and QRM, RITTY uses automatic threshold correction ("ATC") through a proprietary algorithm that attempts to keep DSP sample times constant despite interruptions in or distortions of the audible signal. The theory of ATC is well-known to HF modem designers but its effectiveness as implemented varies from product to product. In direct comparisons between RITTY and the PCI-4000, performance seemed about equal, with one modem sometimes copying text that the other missed.

In the RITTY manual, Brian states, "RITTY's purpose in life is to recover extremely weak RTTY signals other modems can't detect." He describes several features that he says contribute to this purpose: no input limiter to affect signal linearity prior to the detector stage; a noncoherent detector that ignores signal phase; "matched filters" (i.e., DSP equations) for mark and space that are less susceptible than a wideband discriminator to broadband (Gaussian) noise that is always present at HF; automatic threshold correction; and the numerical flywheel. Since the modem generates AFSK tones and therefore requires the transceiver to operate in LSB mode, these design features, all of which are excellent in principle, become critical in printing signals that may not have the benefit of the narrow filters of the receiver.

How well do they work, compared to an FSK modem receiving signals through a 500 Hz or 250 Hz crystal filter? Of course, posing the issue this way really misstates it. The question really is whether narrow filters (which manufacturers always make available for CW and FSK modes but only sometimes for SSB mode) improve the performance of an HF RTTY modem. First, to compare RITTY AFSK to other modems' AFSK: there is no contest with multimode controllers. RITTY clearly outperforms a PK-232, KAM or MFJ in RTTY AFSK mode. When these controllers are operated in FSK mode (and with the receiver's narrow filters), RITTY still has a significant edge. However, when compared to a hardware DSP modem in RTTY FSK, RITTY listening in LSB (at least without the benefit of narrow IF filters) does not perform as well. If you listen to RITTY in FSK mode in order to be able to narrow the incoming signal with the receiver's crystal filters, RITTY's performance then seems equal to that of the hardware DSP units. Unfortunately, RITTY will not transmit in this mode.

This issue of LSB vs. FSK when using sophisticated DSP modems such as RITTY and the HAL models is highly controversial, with some of the Journal's notable contributors such as Peter, TY1PS (and Kenwood with its new TS-870S), agreeing with Brian that the software filters in a well-implemented DSP program do not generally require the assistance of external crystal filters to reduce Gaussian noise. My own experience (as well as some others commenting on the Internet Contest Reflector) suggests otherwise, at least when dealing with weak signals and those with strong adjacent channel QRM, conditions that I, as a DXer and contester, find endemic. I suspect that the reason is the absolute level of Gaussian noise in the tails of the DSP filters has much the same effect as heavy QRM. As Brian, himself says in the manual, "very strong signals in the tails may disrupt copy." Accordingly, mechanical filtering of Gaussian noise present outside of the desired signal's 170 Hz shift has the same significant value that it admittedly has in reducing the effects of loud QRM in the tails of the software filters.

In the manual, Brian suggests using the receiver's 500 Hz CW filter to reduce or eliminate strong QRM in the software filters' tails. This suggestion probably produces excellent results with Kenwood rigs, but my Icom receivers' 500 Hz filters are not operable in LSB mode. Nevertheless, the comments and experiences of other Journal readers on this subject would be most welcome.

One exciting possibility is the development of a new version of RTTY by WF1B that can work with RITTY. Ray and Brian have been working together to make this combination play and may have new versions of both programs available soon. A particularly useful application for RTTY/RITTY would be for DXpeditions using laptops with the Vibra 16 chip on the motherboard (and radios with available narrow filters), eliminating the need for external and inferior HF modems.

For its price of \$100, RITTY offers exceptional performance as a DSP RTTY modem and terminal program, as well as unique software features that would be valuable, if they were available, in any RTTY terminal program. From the excellent tuning indicator to the simultaneously printing of both cases (LTRS/FIGS), this program contains very well-considered features. With additional programming, this same technology could presumably be implemented fairly easily for the -TOR modes. You may obtain a copy postpaid by ordering direct from Brian at 3532 Linda Vista Dr., San Marcos, CA 92069.

BARTG HF

1995 Contest Results

Submitted by John, G4SKA

BARTG Contest Manager

Single/Opr All Band

Place	Call	QSO's	Mults	Cont	Score
1	AB5KD	787	156	6	736632
2	UT0I	542	124	6	403248
3	SM5FUG	488	135	6	395280
4	K4HSF	483	124	6	359352
5	N2DL	422	129	6	326628
6	4X6ZK	395	137	6	324690
7	EM0F	418	128	6	288420
8	UN5OR	348	128	6	267264
9	S53MJ	327	120	6	235440
10	IV3SFG	310	126	6	234360
11	J28JJ	354	110	6	233640
12	WA7FAB	167	105	6	231210
13	PA0XPO	291	126	6	219294
14	EA7GXD	297	131	6	219294
15	4X6UO	339	99	6	201366
16	IK0HBN	297	110	6	196020
17	N9CKC	278	100	6	166800
18	N6GG	328	100	5	164000
19	LA7AJ	267	94	6	150588
20	W7LZP	307	80	6	147360
21	IK0CNA	209	110	6	137940
22	OH2LU	235	92	6	129720
23	EA2IA	225	94	6	126900
24	VE7SAY	251	83	6	124998
25	ZW2A	323	75	5	121125
26	GW4KHQ	232	102	5	118320
27	I2HWI	200	96	6	115200
28	VE6KRR	273	82	5	111930
29	PA0VHA	232	80	6	111360
30	PA3EVY	185	92	6	102120
31	WA6VZI	205	82	6	100860
32	W6OTC	232	85	5	98600
33	KR4NY	268	90	4	96480
34	G0LII	212	90	5	95400
35	SP4SKA	178	81	6	86508
36	N9BHH	170	81	6	82620
37	WB8YJF	195	83	5	80925
38	N1RCT	203	77	5	78155
39	IK2FEO	157	79	6	74418
40	CE8SFG	210	59	6	74340
41	LU8FDZ	203	69	5	70035
42	OZ5MJ	157	71	6	66882
43	RA0FU	169	64	6	64896
44	I0KHP	129	82	6	63468
45	K0OAM	158	79	5	62410
46	IK2VFO	145	69	6	60030
47	N2PEB	152	77	5	58520
48	PA3GKT	155	67	5	51925

49	OK23Q	111	68	6	45288
50	VK6GOM	170	52	5	44200
51	IV3UT	108	66	6	42768
52	WB4TDB	117	73	5	42705
53	N2HOS/4	105	67	6	42210
54	N0FMR	160	62	4	39680
55	W1VXV	109	60	6	39240
56	AA2RZ	112	57	6	38304
57	W2JGR/0	124	50	6	37200
58	ON6NL	106	57	6	36252
59	NA2M	113	61	5	34465
60	IK2GSR	124	55	5	34100
61	F5YJ	119	54	5	32130
62	SM7BHM	101	52	6	31512
63	SM7ATL	91	57	6	31122
64	US9Q	116	53	5	30740
65	UA2FB	130	55	4	28600

Single/Opr 15 Meters

1	AB4OY	119	40	6	28560
2	SP5GRM	63	39	6	14742
3	IK0VXK	26	22		2860
4	JH1HRJ	28	12	3	1008
5	JR4GPA	10	8	3	240

Single Opr 20 Meters

1	LZ1MC	334	55	5	91850
2	VE7OR	241	50	6	72300
3	IK2HKT	200	56	6	67200
4	JH8JBX	180	55	6	59400
5	W6/G0AZT 183	46	6	50508	
6	9A2A	148	47	6	41736
7	EA7AZJ	233	38	4	35416
8	UR5LBX	93	32	5	14880
9	G0PCA	76	34	5	12920
10	IK2VUR	55	33	5	9075

Single/Opr 40 Meters

1	S54A	130	42	6	32760
2	K7DSR	129	27	5	17415
3	VP5JM	183	30	3	16470
4	IV3ZDO	64	25	4	6400
5	JA2NNF	3	3	2	18

Single/Opr 80 Meters

1	SP4CHY	122	32	2	7808
2	UT7I	63	29	3	5481
3	G0MBQ	84	23	2	3864
4	IK1TWC	67	23	2	3082

Multi/Operator

1	GW5NF	656	165	6	649440
2	HG1W	570	149	6	509580
3	IK2MPV	493	157	6	464406
4	OK1KSL	445	116	6	309720
5	AE0Q	344	98	5	168560
6	VE7FJB	236	84	6	118944
7	AA9JY	227	93	5	105555
8	OM3KXM	178	81	5	72090
9	SP5ZIM	72	44	5	15840

Check Logs

AM7ADH, DL2BQV, VK3EBP, YL370FW, EA5RC,
CP1FF, KPEMG, SM5APS, KA1CLV, SM4CJY,
DL9GGA

Countries active in this years contest:

CE, CO, CX, C6, FG, GU, HK, J2, J5, KH6, LX, LU, OA,
TK, TY, VP5, VP8, V3, V85, XE, YB, ZL, 4X, 5T, 9H

BARTG Amtor/Pactor Contest Results 1995

Single/Opr Amtor

Call	QSO's	Mults	Conts	Score
1 OH2LU	38	34	4	5168
2 GW0ANA	18	14	2	504
3 OH2GI	11	11	2	242

Single/Opr Pactor

1 OH2GI	84	47	5	19740
2 OH2LU	74	45	5	16650
3 W6/G0AZT 5	4	2	40	

Single/Opr Combined

1 OH2LU	112	59	5	33040
2 OH2GI	71	30	5	10650
3 SM6BSK	42	26	5	5460

Due to the low number of entries received this year, and comments from some operators against using these modes for contesting, we will not be running an Amtor/Pactor contest in 1996. Many thanks to all who supported this contest, and maybe we will see you in the future on other modes.

73, John G4SKA, (BARTG Contest Manager)





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(cont'd from page 10)

with superior antennas are unable to copy. Amateurs who operate the digital modes must explore the application of real-time noise reduction and be able to take greater advantage of instantaneous phase differences (i.e. diversity reception) typically found with HF radio signals.

A modest 3-6 db increase in station power (usually 100-200 watt level) can be very helpful but take care you don't become an "alligator" — a station who has a large mouth and very little ears. Remember, regardless the mode, there is no substitute for being a good listener.

Last, but perhaps of greatest importance to the amateur operating from a low gain site is having a good attitude toward the challenge. It doesn't hurt to have a "mad dog" philosophy in which "it can't be done" is never considered. The challenge of operating from a low gain site is very similar to the challenge that excites the QRP enthusiast. Enjoyment is achieved through the chase!

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The Last Word

from the editor

by Jim Mortensen, N2HOS

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Things aren't quite right out there. Where there should be joy, there is something almost messy. I'm talking about 20 meter Clover, in and around and on top and underneath 14065.5. The space is jumping with new signals, brand new owners of P-38's who are out to taste the pleasures of this great mode. Many more will soon follow. Some of us have waited a long time for this development. Hi! But none of us were prepared for the way many of the new entrants came on to the scene. Few despair, however, for there are solutions to all of the problems we have seen and heard over the past several weeks. All it takes is some listening, tinkering and cooperation. Let's take a look at some of the options.

First off, check your ALC. From all indications as least half the signals we see on the air are seriously over-driven! Get out your HAL manual now and read the easy-to-follow instructions for adjusting ALC. You don't need to be a rocket scientist to find the little set screw on the rear-end of the P38, key your transmitter, check the ALC level and adjust it until it rests comfortably beneath the 'safe' limits as indicated on your meter. Yes, your power-out drops as you trim the ALC levels but you need a clean signal far worse than you need more power! (see comments by TY1PS in the International Scene column). Then, link with a friend and have him check your signal quality just in case your rig is putting out a 'dirty' signal. If you don't take these steps chances are your signal is going to pollute the entire neighborhood and make a lot of other operators unhappy. Don't risk it.

Next, realize that this 14065.5 wasteland of yore is now as busy as any other part of the digital portion of the band. LISTEN FIRST! Assume that there is a QSO already taking place on this frequency and listen for it before you click the CQ button on Express 3.01. It may take up to 30 seconds before you hear one side or the other of the link. but please wait and please don't call CQ on top of an ongoing QSO. Of course it is done in the SSB world, but let's try to maintain our 'user-friendly' environment. Remember, you no longer have to call on 065.5. That frequency was selected when calling CQ was the primary use of the P38 in Clover mode. Those days are gone forever. Go to 065 or 064.5 or 066, but don't call when you hear another signal on the frequency, even if it is at minimum levels. Remember the rules!

Cut your power next. You don't need an amplifier for Clover. You don't need 100 watts. Cut it down to 50 or even less. We acknowledge that a clean signal with a kilowatt behind it doesn't take any more bandwidth than a 10 watt signal. But, in the first place, there aren't that many clean amplifiers deliver that many clean signals out there. Secondly, the mode will work without that extra push. We aren't in a DX race or a contest. Be reasonable. If the propagation is so bad that a link can't be maintained with 50 watts or less, wait until tonight or tomorrow for a re-link. The files will still be there and, if you broke the link in the middle of sending a picture, the link will pick up at precisely the point where it left off!

Don't go near the QRP calling frequencies. Yes, we have the

right to go down to the bottom of the 20 meter band. But there is no reason to do so and there is certainly no reason to threaten the existence of QRP CW. And that is what you are doing if you call on or near 14060 mark. That frequency has for many years been the primary calling frequency for this growing activity. Many if not most of the sets are Xtal controlled and have no options. As a reminder, the following frequencies are identified as QRP CW: 1810, 3560, 7040, 10106, 14060, 21060 and 28060. Let's all stay well away from these numbers.

Finally, spread out! Where are the signals on 10133, 3565.5 and yes, 21065.5? Clover does work on these frequencies and there are people calling and listening, anxious to have a QSO. We could easily find that 17 meters should serve as a primary band for this mode, but we will never know unless we try. Let's hear some noise there! I was reminded of how nice those 'other' bands can be during the ARRL RTTY test. There was the usual jam-up on 20, but 15 was a perfect pleasure, so nice that I made almost as many contacts there as I did on 20! Try another band tonight.

It's swan song time for W2JGR Jules is stepping down as a regular columnist for the Digital Journal. After serving more than his full term, he has decided to become a roving reporter, contributing observations on any subject from any part of the world. We are eternally grateful to Jules for both the quantity and the quality of his regular columns. Always well written, they were also invariably on time, carefully edited, spell-checked, ready for production. No editor can ask for more. All of us here look forward to his first article, whatever the subject, wherever the locale. Thanks for good and faithful service, Jules.

Don Hill AA5AU becomes Mr. DX around here. You might say he was hand-picked because both Jules and I came up with his name as our first round pick in the DX Draft. Don responded in first class fashion even though he is laboring under a very heavy workload (he is in the communications business professionally as well). He is a first class DX/contest activist and is obviously going to be a first class columnist as well. Welcome aboard Don!

Vanity call signs coming . . . soon. There is now no indication of how many US callsigns will change because of the new 'freedom to pick' rules. But surely there will be some and at least a few of our most well-known digital callsigns will change. For those in contests or in DX pileups, it will be a time of confusion and uncertainty. AB5KD to the rescue! He volunteered to keep track of all the changes and post them from time to time in the Journal. (If you think Ron is just being considerate—which he really is—remember that he also wants to know where his competitors are in the next contest!) If you change or if you know a digital operator who does, please drop Ron a note. And please make note of his new Internet address: <ab5kd@easy.com>.

Joe K4IHP is VK2GRJ/G0M0I and will be operating pactor/mobile Feb 11-Mar 17 in VK and Mar 18-25 in ZL. He will hang around 14067 mark between 0300-0900Z. If you don't have a

good beam chances are slim, but if you really want a pactor contact give it a try. You might hit upon a lucky path.

New on the Internet—<<http://earthlink.net/~n2hos/>>. This will become the Digital Journal portion of the IDRA web page. You can visit either page first and quickly jump to the other, so don't be bashful. While this page is designed for window-shopping non-members, you might check in now and then to look at the 'flash' section. Late news and observations will be posted here. In general, there will always be two or more 'articles of the month,' the current issue's index, and various and assorted surprises.

Among the things I had not planned on doing, designing a web page was high on the list. But, heck, with Earthlink you get a free space. So I did lay it out and get it up on the server. And it worked! Then I got some terrific help from Christine Paustian. As I told her, when she dresses something up it is in evening gowns and tuxedos. Once you click through the site, you will agree. Be sure and get your non-IDRA friends to take a look.

In the meantime, Steve N2QCA continues to maintain IDRA's home page. He is in the process of updating many of the files and has had a few spare days for such labor. As he explained to me in a recent Email... "they are no longer forecasting the snow-fall in inches, but in feet." And, for once, the forecasters failed to exaggerate. Something like three feet fell around Steve's QTH in Yorktown Heights, NY. The "blizzard of '96" will indeed go down in history as one of the worst ever (REAL men survived the 1947 blizzard out west. Details on request!). As an aside, I would like to point out that it troubled me a great deal that I couldn't be up there to share in the miseries of such a storm. Here it did get close to frost, the wind blew like the blazes—to the point where I had to lower the tower during the RTTY contest—but darned if I saw a single snowflake! Too bad.

Ben KR6E writes about low gain sites and what can be done to enhance your operation. He learned the hard way, having been in an apartment for some years. Now, however, he has transplanted his family to a lot where he can have an antenna farm. There will soon be a tower reaching 'way up there' and assorted beams and wires. Very active on Clover, he can usually be found on 20 meters around 14065, often at unpredictable hours. A trauma surgeon and medical researcher, he is quite frequently awake in the Pacific Time Zone before I am in the Eastern! And an 0800 (Florida local time) call is not unusual! I am never sure whether he is going to work, through work or at work until I ask! He's a good guy to meet on the air.

Fred DK4ZC agrees with Peter G3IRM about arranged operating times. "Though I cannot complain about not enough Clover contacts these days we could meet more friends this way. I use to have my US contacts from about 13-1600Z, but also note that I can read RTTY signals from the US about 18-1900Z now and then. Please no skeds at 0300Z Europe time!"

Fred also notes that with the ZP2 and A71 contacts he now has 36 countries on Clover. (*by the way, the first one to achieve 50 confirmed Clover contacts gets a DXL certificate from IDRA—Ed*) The A71 was Mohamed A71EY's first Clover contact. But, says he, "I also have another record. I have been jammed on 14066 LSB with eight different signal types! Count them—a carrier, an interrupted carrier known as CW, RTTY, Amtor, Pactor 1 & 2, SSB and Clover! The operators were mostly amateurs but also intruders and commercials. They all had strong signals and could hear me."

Alex WB6AFJ, on RTTY for 35 years, feels that there is "... going to be a real mess on our hands real soon if we don't do anything." He is talking about packet, Pactor and Amtor crowding RTTY'ers off the bands. Alex feels that the world needs to know where the frequencies are for each of the modes. In other words, a band plan. I didn't offer much encouragement in response to his Email, but I did notice that RTTY had no trouble defending itself during the ARRL RTTY contest. The signals worked their way through all the HF packet, and everything else all the way down to 14065. The next day all was normal and there was one audible RTTY signal on 20 meters... and packet was all the way down to 14088, and Pactor was up above 14080... and nobody was there to complain.

The Disk Library is taking shape. Want a floppy copy of the latest versions of Lan-Link, Winlink, WORLI, HYLOG, Adobe Acroview or Express 3.02? Send in an order anytime. The price—\$5 for each of the above postpaid anywhere. Keep in touch with the latest list by checking Flash on the N2HOS web page (see above for address).

73, de Jim N2HOS sk

TARA RTTY

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N9CKC 3120	104	27	3	
KB5HVN	3030	101	29	1
KF4BU 1386	63	20	2	
W2JGR/0	1254	57	19	3

Single Op, Low Power

WS7I	6536	152	43	
AA5AU	5054	133	33	5
KE7GH 4860	135	35	1	
N1RCT 3640	104	31	4	
V31JU 2640	80	30	3	

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none so far

Multi-Op, Low Power

N1JEB 1122	51	20	2	
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