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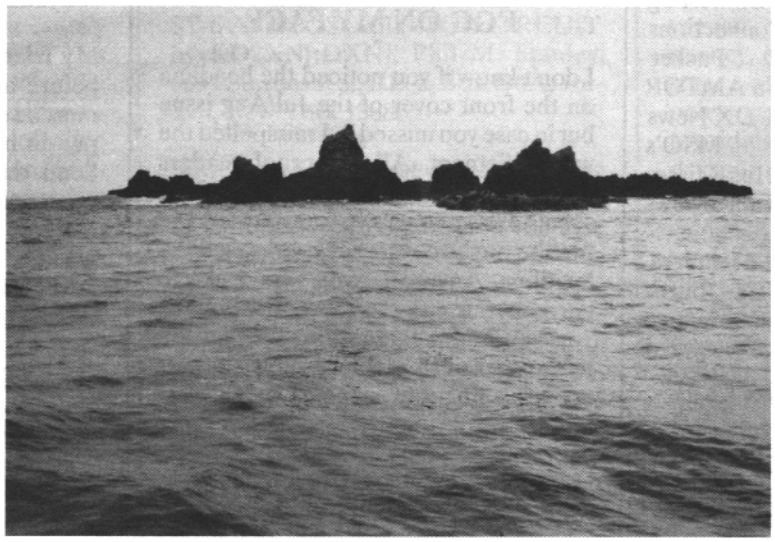
ON THE ROCKS



NATAL Group approaching St. Peter and Paul Rocks which are about half way between Brazil and Africa. This daring group certainly deserves our front cover. (See story in DX News)

NATAL Group undertaking the task of unloading all the gear for their DXpediton to the ROCKS. Not an easy task to be sure. Congratulations on the fine effort NATAL.

IN THIS ISSUE

RTTY JOURNAL

Dale S. Sinner, W6IWO
OWNER-EDITOR-PUBLISHER

ALL CORRESPONDENCE TO:
9085 La Casita Ave. Fountain Valley, Ca 92708

TELE: (714) 847-5058

FAX (714) 892-2720

RTTY JOURNAL STAFF COLUMNISTS

Hal Blegen, WA7EGA Contesting
Cole Ellsworth, W6OXP Connections
Richard Polivka, N6NKO Packet
Eddie Schneider, G0AZT/W6 AMTOR
John Troost, TG9VT DX News
Dick Uhrmacher, K0VKH MSO's
Dale Sinner, W6IWO Hits-Misses
Jay Townsend, WS7I Software Reviews

Other RTTY Journal Staff Members
Roy Gould, KT1N CQ/RTTY Journal Contest Manager
Betsy Townsend, WV7Y Awards

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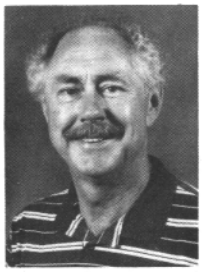


HITS & MISSES

Dale Sinner, W6IWO
9085 La Casita Ave
Fountain Valley, CA
92708

EGG ON MY FACE

I don't know if you noticed the headline on the front cover of the Jul/Aug issue but in case you missed it, I misspelled the word Vietnam. All the proof readers missed it, even the printer missed it. It seems everyone was so intrigued by the picture on the cover they overlooked the headline. Anyway, if you would like to correct your copy to the right spelling, you will find a large letter "M" on the back cover of this issue. Simply cut it or copy it and paste in place on the last issue.

CQ/RTTY JOURNAL W/W RTTY CONTEST

I hope propagation is good to us this year for the contest. From what I have been hearing, we can expect a great turnout with lots of DX stations participating. I'm sure the contest will be over by the time this issue reaches many of you but hopefully you marked your calendar last month.

Roy Gould, KT1N tells me that all the certificates and plaques from last year's contest have been mailed. It always takes about one year from close of the contest to process all the logs, declare the winners, and then issue all the awards. If are expecting an award, it is on it's way to you.

YOUR THOUGHTS PLEASE

Last month I wrote of the MSO controversy but column space limited me in my coverage, so this month I'll try to finish what I had intended to write about in that last issue.

Really our problem is not just the MSO's (BBS's) which have sprung up in different portions of the bands, the real problem is also manifested by the infringement in the RTTY section of both Packet and AMTOR. We need to address this situation immediately my digital friends. Internationally we must face this issue and once again make our long standing gentlemen's agreement work.

In this issue you will find the debate is red hot with two staff members writing directly about the problem. Tom, OD5NG from Lebanon has also voiced his opinion through a letter to John Troost, TG9VT (see page 19). It is time for you to express your opinions too!

My friends we have moved mountains before and we can do it again but we must be united in our efforts. Please take pen in hand and express your opinion. Send them to me or to your League representative. I'm hoping my mail will increase significantly this next month. So whether you are into Packet, RTTY, or AMTOR let me hear from you and thanks for getting involved.

SAME OLD STORY

This month we are missing our AMTOR column because Eddie has run out of things to write about. I know he has asked for questions from the readership but apparently he not getting any. I can't believe there are no questions to be asked about AMTOR. Eddie would like to hear from you; write to him and encourage him with your comments and questions.

Keep the mail moving to our other columnists as well. They thrive on your comments, questions and suggestions. The Journal has a fine staff of writers (my opinion) willing to give a helping hand where needed. But all writers, need food for thought - write to them - you'll be glad you did.

Not much more this month, I hope you enjoy all the pictures in this issue. I have been wanting to publish some of these for some time now but space has been at a premium in the last two issues. Until next month, 73's. **de Dale, W6IWO**

BEACONS

ARE FOR THE BIRDS!

CONNECTIONS

Cole Ellsworth, W6OXP
10461 Dewey Dr
Garden Grove, CA
92640

Labor Day is here and that is exactly what I am doing - Laboring on this column. Attended HAMCON 89 at the Los Angeles Airport Hilton and it was a lot of fun. Even got a few feet of video tape. Seeing more and more Ham computer software and applications.

NEW PRODUCT ANNOUNCEMENT

AEA (Advanced Electronic Applications, Inc.) has announced a new computer program for the MacIntosh with 512K Enhanced, 512e, Plus, SE and MAC II and is not copy protected. This new product is named "MacRATT with FAX" and is for running the PK-232 with the Mac. The announcement highlights the following features:

* Includes cable.

* Windows for entering text, displaying the receive buffer, and logging transmitted text. All windows employ features unique to the Mac such as scrolling and copying to the clipboard.

* Window display of the status of file transfers and the link between the PK-232 and the Mac.

* FAX is an integral part of the program, and FAX images can be sent to the printer without changing cables.

* MacRATT runs the PK-232 in host mode for fast efficient operation and will run under Multifinder.

* Text uploading, downloading, and printing are simple and easy. There are 20 macro keys that can be used to speed text entry.

* Character at a time sending for RTTY, AMTOR, and Morse.

Price class is $60, AEA, (206)775-7373.

CONSTRUCTION ARTICLE OF THE MONTH

This month is a submission to the RTTY Journal by KD2XN and should be of interest to ST-6 owners and anyone with an AFSK tone generator.

"ACTIVE FILTER FOR THE HAL ST-6 AFSK OSCILLATOR CIRCUIT by KD2XN[:DXN], Phil M. Stanley, 6894 Stevens Rd., RD 1, Box 194A, Jordan, New York 13080.

"One of the biggest concerns with generating an RF signal is the presence of *"unwanted harmonics"*, so is the case for *RTTY* and *AFSK* tones. The *Hal* ST-6 Terminal Unit, manufactured by the *Hal* Communications Corp., Urbana, Ill., employs a 5-pole Butterworth lowpass filter to attenuate those unwanted signals, in particular, the 2nd and 3rd harmonics of the **MARK** and **SPACE** tones. The Hal passive filter, Figure 1, uses two 88 mH toroids-L1,L2, somtimes not the most commond items in the "junk box." This article will describe some of the more important aspects of the filter and the design steps used.

Filter"s Purpose

"The filter serves two purposes. The first is the filter's ability to "smooth" the square wave generated by the BSMV (bistle multivibrator) resulting in a sine wave and its fundamental frequencies-2125Hz for **MARK** and 2295Hz for **SPACE**. The second purpose, and most important, is the attenuation of any harmonics of the AFSK tones being generated. (i.e. 2X2125HZ, 3x2125Hz, 2X2295Hz and 3X2295Hz). There should always be a lowpass filter following every AFSK oscillator design!

The Passive Design

"Figure 1 is the schematic of the passive 5-pole filter and the frequency response (computer generated) is shown in Figure 2. Table 1 shows the frequency versus VOUTPUT. The *break*, cut-off or -3dB, *frequency is 3760 Hz.* The 2nd and 3rd harmonics, of the **MARK** frequency, are down *14.12 Db* and *34.73 dB*, respectively. GREAT!, so the worry of a "W-I-D-E signal" is no longer a concern! For those of you interested in filter design and would like to walk through a design of your own, I have listed the poles in Table 2, in both *Hertz* and radians per second (RPS).

The Active Design

"Once the *poles* were determined I set about designing the three stage active version. Table 3 shows the cut-off frequency, circuit *Q* and the gain for each stage. The first two stages are both 2-pole lowpass filters with the 3rd stage providing the 5th pole to complete the design. Figure 3 shows the completed 5-pole active filter. Initially, stage 3 was designed for a gain of 1 or 0dB, which set R7 equal to 7.6K ohms. However, due to the large input signal, 5 V_{PEAK} or 3.535 V rms, I attenuated the signal through stage 3 by 20.2 dB, and with the voltage divider (R9 and R10) at the output. This provided a convenient method of achieving the low level AFSK output voltage. I have included several values in the table that should fit most requirements, but if the output needs to be adjusted for one reason or another the following formula can be used to easily calculate the AFSK output voltage at NODE #11;

Given V_{in} = $5V_{PEAK}$ = 3.535 Vrms,

V_{AFSK} = V_{in} X[1370.5/R7(K-ohm)] = mVrms.

Example: 3.535Vrms X [1370.5/220] = 22 mVrms.

"It should be noted that the filter's frequency response is not affected by the change in resistor R7. I have found that 10mV-20mV rms is sufficient input voltage for most modern transceivers. This range will allow reasonable **MIC GAIN** settings for adjusting your *RF output.*

"The frequency response of the active filter, computer generated, appears in Figure 4. It should be noted that the response in Figure 4 is measured at NODE **9** with **R7** equal to 7.6K ohms.

CONNECTIONS Continued on page 4

CONNECTIONS Continued from pg. 3

Frequency versus output voltage in dB apperars in Table **1, f** vs VOUTPUT. The break frequncy is *3807 Hz.* As a note, the - *3dB frequency* is within **47**Hz of it's passive counterpart; so far so good!

"The attenuation of the harmonics with this filter is quite good. The main reason being the change in the gain of the third stage. From the input of the active filter to the AFSK Hi-Z output, the attenuation is -44dB!! In the passband the -44dB provides the necessary 20mVrms with a $5V_{PEAK}$ input signal. An additional 15dB of attenuation is acquired in the third stage as follows:

$V_{OUT(NODE\ 9)}$ = 20log[R8/R7] = 20log[7.6k/220k ohm] = -29.2dB

"And the voltage divider at the output of U3 will provide an additional 15dB of attentuation as follows:

$V_{AFSK(NODE\ 11)}$ = 20log[R10/R9] = 20 log[220/1220 ohm] = -14.88dB.

"Therefore, the magnitude of the output signal at NODE 11(V_{AFSK}) of the 2nd and 3rd harmonics for the **MARK** frequency would be:

at NODE 11, $V_{4250\ Hz}$ = -8.686 + -29.2 + -14.88 = -52.77dB!

And,

at NODE 11, $V_{6375\ Hz}$ = -29.215 + -29.2 + -14.88 = -73.30 dB.

Parts List

"The 5-pole active version utilizes 3 operational amplifiers - U741. These amplifiers are available from Motorola as an MC4741 (quad op-amp). Unlike the toroids in the passive design, the active version does not require any tuning! The filter can be layed out using either 3 individual I.C.s or the quad 741 in a 14-pin dual-in-line package. Standard vaue capacitors were chosen to simplify the construction of the filter and should be, at minimum, +/- 2% with 1% being the best choice. A ceramic dipped capacitor (radial leads) with a type "X7R" dielectric material would be adquate for this design. In order to maintain as close a response as possible to the actual design, the resistors and capaciotors must be chosen so as to match as closely as possible, to those values shown in the schematic to acheive the desired frequency response. The operational amplifiers' V- and V+ are connected directly to the *ST-6*'s +/- 12V power supplies. Power supply "decoupling" at the I.C. should be implemented as shown in Figure 5.

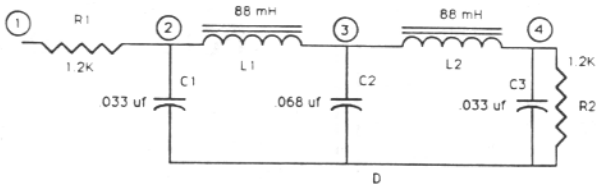


Figure 1
Hal ST-6 PASSIVE 5-POLE LOWPASS FILTER

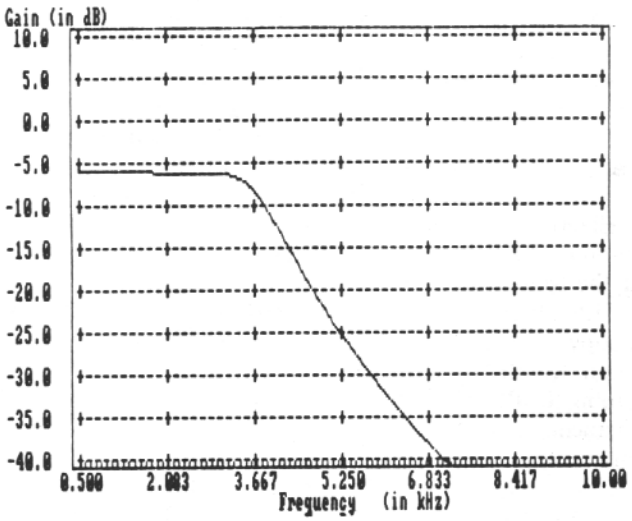


FIGURE 2

Frequency Response
of
Passive 5-Pole
Butterworth Filter

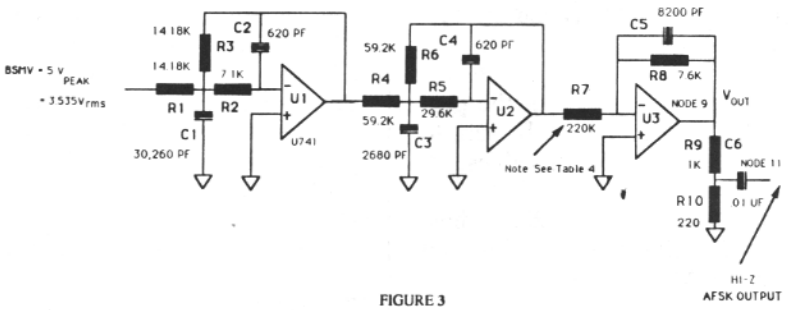


FIGURE 3

ACTIVE 5-POLE LOWPASS BUTTERWORTH

de KD2XN

CONNECTIONS Continued on next page

CONNECTIONS Continued from page 4

Frequency Response vs V_{OUT}

Passive Filter Freq	Node 4 dB	Active Filter[1] Freq	Node 9 dB
500 Hz	-6.037	500 Hz	0.002
700 Hz	-6.044	700 Hz	0.008
800 Hz	-6.047	800 Hz	0.013
1000 Hz	-6.053	1000 Hz	0.024
1200 Hz	-6.059	1200 Hz	0.038
1500 Hz	-6.071	1500 Hz	0.061
2000 Hz	-6.108	2000 Hz	0.097
2200 Hz	-6.125	2200 Hz	0.116
2400 Hz	-6.136	2400 Hz	0.146
2600 Hz	-6.138	2600 Hz	0.189
2800 Hz	-6.141	2800 Hz	0.231
3000 Hz	-6.181	3000 Hz	0.221
3200 Hz	-6.356	3200 Hz	0.033
3400 Hz	-6.836	3400 Hz	-0.544
3600 Hz	-7.820	3600 Hz	-1.716
3700 Hz	-8.534	3700 Hz	-2.541
3750 Hz	-8.944	3760 Hz	-2.640
3755 Hz	-8.977	3765 Hz	-2.663
3760 Hz	**-9.030**	3780 Hz	-2.758
4250 Hz	-14.123	3795 Hz	-2.903
4590 Hz	-18.095	**3807 Hz**	**-3.003**
6375 Hz	-34.731	4250 Hz	-8.686
6885 Hz	-38.426	4590 Hz	-12.682
8000 Hz	-45.496	6375 Hz	-29.215
9000 Hz	-50.915	6885 Hz	-47.770
10,000 Hz	-55.704	9000 Hz	-45.807
		10,000 Hz	-50.097

NOTE 1: R7 = 7.6KΩ.

TABLE 1

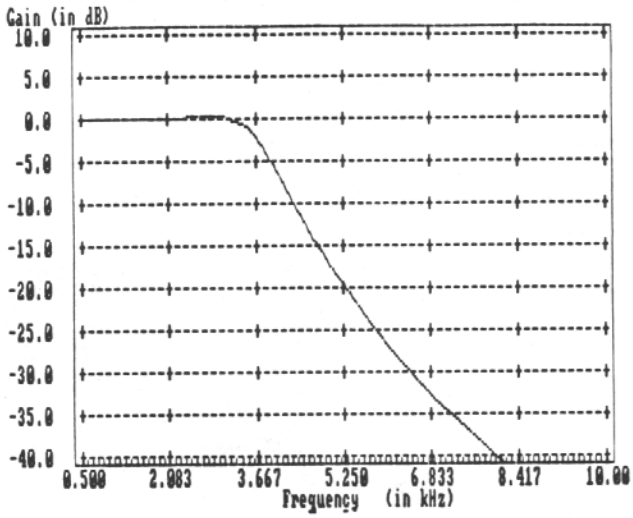


FIGURE 4

Frequency Response
of
Active 5-Pole Butterworth
Filter

ACTIVE FILTER

STAGE	fc	Q	GAIN
1	3.664 kHz	2.47	0dB
2	2.950 kHz	.735	0dB
3	2.534 kHz		29.2dB

TABLE 3

POLES

POLE	Real(RPS)	Real(Hz)	Imag(RPS)	Imag(Hz)
1	-4.66644E+03	-7.42363E+02	-2.25449E+04	-3.58813E+03
2	-4.66440E+03	-7.42363E+02	+2.25449E+04	+3.58813E+03
3	-1.26263E+04	-2.00953E+03	-1.35989E+04	-2.16433E+03
4	-1.26263E+04	-2.00953E+03	+1.35989E+04	+2.16433E+03
5	-1.59237E+04	-2.53434E+03	0.0	0.0

TABLE 2

AFSK Output

R7 CALCULATED	R7 STANDARD VALUE	Node 11 V_{AFSK}	Node 9 V_{OUT}
488K	470K	10mV	60mV
220K	220K	20mV (RMS)	122mV
162K	180K	30mV	150mV
121K	120K	40mV	224mV

TABLE 4

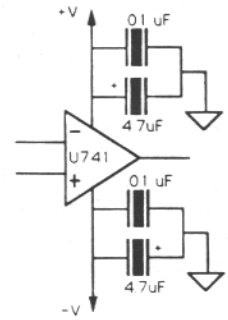


Figure 5

"Decoupling"

Summary

"This design is entirely "on paper" (**aha! I knew there was a catch - W6OXP**) and is intended to replace a missing passive filter in my spare *ST-6* and provide "food for thought" regarding passive and active filters and a *CLEAN* RTTY signal! This design can be readily adapted to most any AFSK oscillator circuit. My busy schedule (2 harmonics and a kitchen remodeling project) has limited me to only a paper design at the moment.

"Portions of the design were accomplished using several software packages for filter and circuit/nodal analysis. One of the software packages that was used in the design, as well as for the graphical analyses, was *Nova*[1]. I would be glad to entertain any questions concerning this design, your results or just your thoughts regarding this project. Drop me a line or leave a message on the *National Autostart Frequency*.....be listening for those CLEAN RTTY signals! 73."

"Notes:

1. *Nova,* RF Engineering, Inc. Ithaca, NY (software).
RD 1 Box 587, Chenango Lake Road, Ithaca, NY (607)334-8911.

2. *Motorola,* Linear/Interface Devices, pp 3-186.

3. *Union Carbide*/KEMET Electronics Div., capacitor catalog pp 131."

Thank you Phil, for a most interesting article. Hope you will let us and our readers know what your "after construction and test" response curves look like, and where you found the 1% capacitors. We will be looking for another paper from you soon.

That is all for this month, gentle readers, Very 73 **de Cole W6OXP**

INTERNATIONAL

Digital Modes in "EI" Land

by Line: Liam O Currain, EI3GC

In Ireland the first step in becoming an amateur radio operator is to pass a written exam on Basic Radio and electrical theory. Having successfully passed the theory exam a license is issued for operation on VHF/UHF using all modes including RTTY, CW, etc. This is Class B license.

To operate on HF a Class B licensee must pass a CW test of receiving and sending at 12 WPM. Once passed, the licensee is issued a Class A license which then limits the operator to HF CW for one year using only 25 watts PEP and confined to only 40 and 20 Meters. After one year of this operation, the operator is then allowed all band, all mode operation.

There are slight differences in frequencies, modes, and rules compared to other countries because in EI land all Class licensees are considered Radio Experimenters, not Radio Amateurs. However, the Class A HF license is equivalent to the highest grade license issued in most countries.

Over the past ten years the interest in Amateur radio in Ireland has reached an all time high with some 1500 licenses currently issued. This interest is "I feel", due to the many op's like myself coming up from the CB ranks and then finally getting their ticket. Not the purist's way of getting people into the hobby, but if this route gets good ops on the air, why not. Also, Amateur radio has received much media attention over the past few years thanks to the IRTS (Irish Radio Transmitters Society).

The main digital mode in use at the moment is Packet, with over 200 operators active which have come from the large ranks of Class B operators. The Packet network includes four digipeaters which cover the whole of Ireland with several PBBS's. The digi's use NET/netrom while all but one of the PBBS's use MBL, the exception being the Dublin PBBS which uses "BOX". It is quite easy to work direct to the UK on VHF and since the digi's went into operation in 1986/87, Packet has surpassed FM operation at least in Dublin (where I live).

Alas this interest in Packet is not reflected on HF digital modes. I took a small survey before writing this article and came up with the following results about RTTY operators which are part time operators (by part time, I mean these operators also operate SSB/CW etc.). Jim, EI8GS, Pat, EI5DA, Tom, EI9BG, and Brendan, EI0CZ can be found from time to time operating RTTY. Only Pat, EI9CB and myself use no other modes but digital on HF. Pat can be found "haunting" 14 090 Mhz while I tend to hop from band to band but 21 090 is my favorite listening spot. So as you can see, with only a handfull of operators on the digital modes, interest is very low. I have been trying to stir up interest in AMTOR/RTTY over the past few months by including the DX1 RTTY DX NEWS bulletins into the IRTS News Bulletins thereby letting the SSB/CW boys know what they are missing on the digital modes.

The IRTS is the National Society for radio experimenters (amateurs) in Ireland. The Society was founded in 1932 but has its' roots in the Dublin Wireless Club which was founded in 1913. Included among the society's news bulletins is a RTTY News Bulletin each Sunday at 0915Z on 3 600 Mhz 45 baud FSK. The society also issues a WEIC certificate for working 20 or more of the 26 counties in Ireland and the certificate can be endorsed for RTTY.

I have used RTTY/AMTOR for the last three years on HF. My station is comprised of PK-232/C-64, FT747GX outputting about 80 watts up the spout. The antennas are a homebrew tribander for 10,15 and 20 Meters and a multi/band dipole which is 108 feet long each leg and center fed with 30 feet of ribbon feeder then balumed to 50 ohm coax (it beats the pants off of a G5RV). The local MB's I use are LA9OK, OD5NG, or SK7CS and my own PBBS is EI5CI, so if anyone wants a sked let me know via either the MBS or CBA.

If you planning to come over for a holiday to EI land, reciprocal licensing is as follows: up to 30 days is free, one month to three months is IR 8.00 (12 dollars) and over three months re-application must be made. Do not forget to bring current license and proper ID.

I hope this short article has been of interest to you and if you wish further information please contact me at PO BOX 462, Dublin 9, Rep of Ireland.
CUL 73 **de Liam, EI3GC**

Liam O Currain, EI3GC in his shack surrounded by lots of fine equipment and being a dedicated RTTYer his RTTY Journal is close at hand.

PACKET

Richard Polivka, N6NKO
7052 S. Freinds Ave. Apt. J
Whittier, CA
90602

WELL

Let's see.... I mentioned several items in the last article and left them hanging so I guess I will continue with the tradition and start by leaving a few more hangers on. I mentioned something about a Phoenix to happen out of the NetRom vs TheNet scrap, well, how about the Rose Switch as a replacement. I also want to cover the BBS program MSYS. Both are on their way to me on disk so I can get to their DOCs and start digesting them (sounds like my 20mb hard drive is going to have to go on a diet....). So we shall cover one item, KA9Q's TCP/IP package. This issue will cover the documentation involved with the package and then we will get into the operation of it next. And, away we go.....but first this commercial message.....

--- start commercial here ---

Do you want to have POWER over communication? Do you want to let other people know that YOU exist and in a GRAND way? Well, then set the beacon from your mailbox to pop off every 10 minutes and announce to the whole world that you are now set up to do mail forwarding. This will show everyone that you EXIST and make sure that it takes up one whole line and so it can be seen in a GRAND way and that you have POWER over the whole channel. This advertisement has been brought to you by POOP, Poor Operators On Packet.

--- end of commercial insertion ---

TCP/IP

Oh no, not this again, I hear you say. Why does he have to get technical on us again. Well, all of youn'z out in the ether, it isn't technical. Just because it takes a computer to operate it doesn't make it hard to understand. Actually, in the case of TCP/IP, the computer does the dirty work and the TNC is in KISS mode. Well, onto the DOCs and enough of the trivial talk.

The DOCs for TCP/IP are about 300k in length and that is just the manual. I have gathered up another 200k of DOCs from previous releases of the software which, by the way, is referred to as the "bits" by people who use the package.

Another nice thing about the documentation with this package is that the configuration files really need to be a few lines in length but the files as written have enough documentation within them to help you get them set up and running with a little help from the manual. The configuration files are used to tell the software what to do, like the host name of the computer and the amateur call of the station.

Now comes the manual. It is 104 pages in length not including the Table of Contents and was written by Bdale Garbee, N3EUA. The manual starts out explaining what TCP/IP is and how it works. From there, he covers how to set up your equipment and what needs to be done to the TNC. There is also coverage as to how to load the software on to your hard disk and get that up and running. This is a little weak in the explanation on how to set up your file system and its many directories. From that, he covers how to, as he puts it, take TCP/IP for a test drive. For the people who want to get into the meat of the thing, the various commands are covered. I wish that the details for each command would have been more in depth but that could lead to another problem, making it too technical to understand. The technical part is covered in the back of the manual using skeleton structures to explain what is going on within the program.

For a package that is as complex as this one is, Bdale did a good job. Admittedly, it gets a bit technical for the rank novice to this kind of programming but that can't be avoided because of the naturally technical subject that it is trying to cover. I guess that is why in this world of Amateur radio we have the "Elmer" system, which should be used more often. We all can use a bit of help now and then. The rest of the documentation that I picked up off of other bbs's about TCP/IP is the older documentation to previous releases. I grabbed it because in them, there are subjects that are covered in them that are not covered in the new documentation.

HAMCON

Well, Hamcon (The ARRL Southwestern Division Convention) is here and gone. It appeared to this observer and participant that the turnout was lower both in attendance and exhibitors. I only was able to attend one day due to scheduling conflicts. So, here goes.....

First off, do you have a spare $90,000 lying around that is burning a hole in your pocket? Well if you do, the talk to Tektronix. They have a great little piece of test equipment that they would love to sell you. It is a real-time spectrum analyzer. I can hear you say that all analyzers are real time. Well, they are not! The vast majority do a serial analysis of the spectrum by looking at the amplitude at one frequency, displaying it, and then sweeping across to the next frequency. Well, this one does it in a 300ms snapshot and then displays the whole thing. They were demonstrating how BROADBANDED HT's are when they are unkeyed. As an example, yours truely has an ICOM 02AT HT that based on their frequency counters is only 71.9 HZ off frequency at 146.000 MHz. Well, when the HT is keyed and unkeyed on that frequency, the splatter generated from the HT covers about 10 MHz or so. It really looked ugly on the screen to see. The slop was just about all gone when I let the radio unkey itself after releasing a touchtone key. I guess that the PTT switch is the culprit in this case with DIRTY contacts and sloppy buffering. That display was gathering a big crowd with every one wanting to see how bad their HT's really were.There was even a factory rep for one of the radio companies watching intently.

Kantronics was showing a new product at the show called the DVR 2-2 Data/voice radio. It is a ROCKBOUND radio that is designed for Packet from the top down. It uses PIN diode T/R switching at the antenna end and with this coupled to 2 watt transmitter, is up to full power in 5 ms. after key down. The radio has in it a built-in Carrier Detect circuit that reacts in about 10

PACKET Continued on page 15

PC BIRDIES

by Bill Henry, K9GWT
President HAL Communications Corp.
Urbana, Il 61801

BIRDIES? - Yes, birdies - the RFI kind. The Personal Computer (PC) is a wonderful gadget. It can do most anything for us - maybe even wash the dishes. It is a really neat toy for us RTTY-types. However, it can be a "royal pain" when we also want to use our HF radios.

Actually, please credit Hal Blegen., WA7EGA and his column in the July/August issue of RTTY Journal for the "birdy" idea - and inspiration for this short article. Whatever happens from here on -- it's your fault, Hal!

Reading Hal's comments, it occurs to me that we all go though RFI problems with computers and some of our experiences at HAL Communications might be interesting and useful to others.

WHY DO PC's HAVE RFI?

RFI comes with - it's free! We all want our computer to be the biggest and fastest - and have all the latest color graphics, a zillion I/O connections, and do everything. Unfortunately, for the computer to do all these things, it has to include fast logic IC's and very high frequency clocks. To get fast processing speed, the logic IC's have to have very sharp pulses - very fast rise and fall times. Every time one of those computer pulses goes up or down, a whole spectrum of radio frequency energy is also generated. The faster your computer, the wider the spectrum, and the stronger the noise components. Fast pulses are required to make the computer work. The challenge is to keep the fast pulses (and their RFI) inside the computer cabinet.

The same fast pulse responses required to make the computer work also makes it very susceptible to our HF transmitter RF. Logic IC's are pretty stupid. They don't care if their pulses come from a computer clock - or from our 20M RF signal. Get enough RF into a computer and it really jumps - right out of our program and into it's own world! So, we must keep the transmitter RF out of the computer as well.

AREN'T THERE SOME FCC RULES ABOUT COMPUTER RFI?

There sure are and they cost manufacturers a bunch of time and money. Each device with a "clock" (oscillator) frequency greater than 9 kHz (was 10 kHz) must undergo test and certification to FCC Part 15, Subpart J specifications. There are two FCC categories, "A" and "B". Category "B" is the tightest and applies to consumer products, including amateur radio equipment. Category "A" is for "commercial use" and is about 20 dB less stringent. Each manufacturer spends of the order of $5,000 to $10,000 per new product to get it tested and certified. Fail the test and you get to change the circuit and try again - with another bill for testing. We soon learn to do it right the first time!

However, the FCC RFI limits are not set up with HF radio equipment in mind. Rather, the primary goal is to protect consumer radio and television reception. Prior to Subpart J rules, some early personal computers would take out Channel 3 - a block away in some cases. Equipment meeting Category "B" no longer does that. But -- a completely qualified Category "B" computer may still put out quite a spectrum of RFI birdies on 20 meters! So, having the FCC sticker on the back of your computer helps but is no guarantee for amateur use. In amateur use, we need much better RFI suppression than the FCC requires.

OK, WHAT DO I DO ABOUT IT?

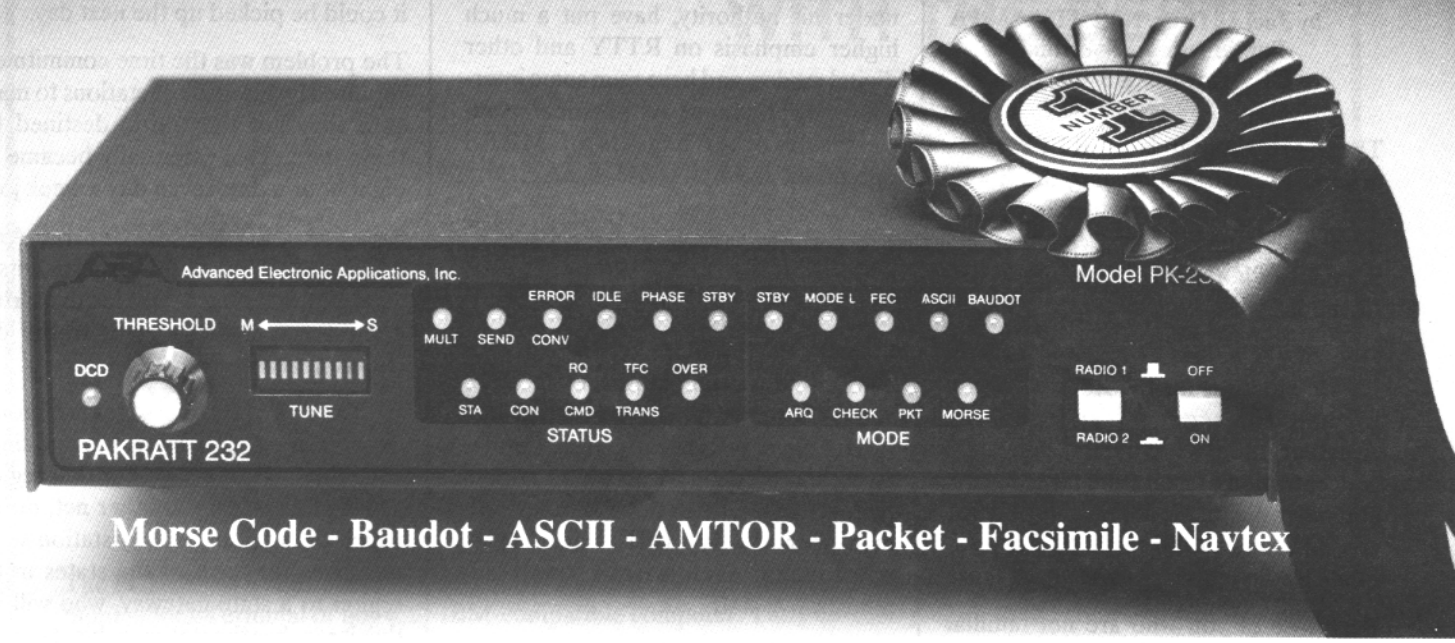
Glad you asked. There are a number of things we can do about PC RFI, some simple and some not so simple. Here's my list:

1. Forget color video for ham use. CGA, EGA, and VGA look great. Their video cards also have about 20 dB more RFI output than the "Hercules-compatible" monochrome cards. Color monitors are also more likely to radiate RFI than a monochrome CRT. Again, it's the fast pulses required for good crisp color video that does us in.
2. Inspect the cabinet, especially where the top and bottom halves mate. There should not be any paint on the mating surfaces. The better cabinets hav e special tinned mating surfaces. If you have a choice, choose a metal rather than a plastic cabinet, even if "conductive plastic" is advertised. PUT THE SCREWS IN THE CABINET! It's easy to forget, especially if we have been trying different boards in the PC.
3. GROUND THE PC! Connect an RF ground to the computer cabinet. Also, run a ground wire to the keyboard bottom plate. Run a ground wire between the CRT and the computer cabinet.
4. Use shielded I/O cables. Pre-made cables are now very cheap. Some are very well shielded, some have little or no shielding. It's worth a few bucks more to buy a good cable with a braid shield.
5. Look at your video and serial I/O cards closely. Is there a ground connection between the little metal rear-panel plate and the circuit board ground? Very few PC I/O cards have this ground. It can make a BIG difference in RFI output.
6. Are there any by-pass capacitors on the serial and parallel I/O connectors ? Very very few PC cards include by-pass capacitors. Soldering a 0.001 uF ceramic between each connector pin and ground can do wonders for RFI suppression. This may take some "playing" as you might end up by-passing your data signal to ground as well! I have found very few places where a 0.001 uF capacitor affected a serial or parallel I/O output of a PC. Be careful about video, however - you cannot put a 0.001 capacitor across the video and expect to see much on the CRT. 50 or 100 pF may be as large a value as you can use.
7. The coiled-cord keyboard cable makes a great antenna. You can even "change the band" by stretching it! Get a big toroid at a hamfest and wrap several turns of the keyboard cable through it - at the end that plugs into the PC.
8. If you are going to just use the PC for ham use, buy the "old-style" PC-XT rather than a faster PC-AT or PC-386. The RFI from the slower PC-XT (4.88 MHz clock) is usually a lot less than from the faster computers. Beware the

PC BIRDIES Continued on page15

Others May Try to Imitate, But...

Only One Can Be The Best



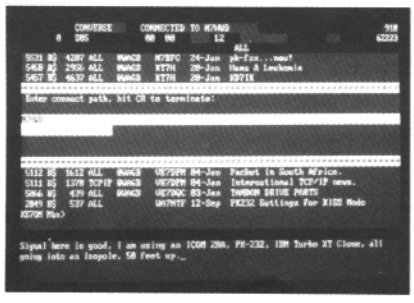
Morse Code - Baudot - ASCII - AMTOR - Packet - Facsimile - Navtex

It's a lesson you learn very early in life. Many can be good, some may be better, but only one can be the best. The PK-232 is the best multi-mode data controller you can buy.

1 Versatility

The PK-232 should be listed in the amateur radio dictionary under the word Versatile. One data controller that can receive seven digital modes, and can be used with almost every computer or data terminal. You can even monitor Navtex, the new marine weather and navigational system. Don't forget two radio ports for both VHF and HF, and a no compromise VHF/HF/CW internal modem with an eight pole bandpass filter followed by a limiter discriminator with automatic threshold control.

The internal decoding program (SIAM[tm]) feature can even identify different types of signals for you, including some simple types of RTTY encryption. The only software your computer needs is a terminal program.



PC Pakratt Packet TX/RX Display

Facsimile Screen Display

2 Software Support

While you can use most modem or communications programs with the PK-232, AEA has two very special packages available exclusively for the PK-232....PC Pakratt with Fax for IBM PC and compatible computers, and Com Pakratt with Fax for the Commodore 64 and 128.

Each package includes a terminal program with split screen display, QSO buffer, disk storage of received data, and printer operation, and a second program for transmission/reception and screen display of facsimile signals. The IBM programs are on 5 1/4" disk and the Commodore programs are plug-in ROM cartridges.

3 Proven Winner

No matter what computer or terminal you plan to use, the PK-232 is the best choice for a multi-mode data controller. Over 20,000 amateurs around the world have on-air tested the PK-232 for you. They, along with most major U.S. amateur magazines, have reviewed the PK-232 and found it to be a good value and excellent addition to the ham station.

No other multi-mode controller offers the features and performance of the PK-232. Don't be fooled by imitations. Ask your friends, or call the local amateur radio store. We're confident the PK-232 reputation will convince you that it's time to order your very own PK-232.

Call an authorized AEA dealer today. You deserve the best you can buy, you deserve the PK- 232.

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P.O. Box C-2160
Lynnwood, WA 98036
206-775-7373

AEA Retail $415.95

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THE NEW WORLD OF ARMY MARS

by **Joel L. Dyer, N0GHT/AAA9PA**
Public Affairs Coordinator
US Army MARS Worldwide

There are thousands of RTTY users around the world, pursuing the hobby and enjoying the unique thrills offered by experimenting with and communicating via RTTY and the various other digital modes.

One of the oldest traditional uses of RTTY modes is for the transmission of formal, for-record traffic. In the Amateur radio community, one large concentration of operators using RTTY and other digital modes for this purpose can be found in the three Military Affiliate Radio Systems - MARS, for short.

For those of you who are not familiar with MARS, each of the three major branches of this country's military service, the Army, Air Force, and Navy/Marine Corps, has an affiliated group of Amateur radio operators who volunteer their time and the facilities of their stations on behalf of the military services, their members and dependents are scattered around the world.

The primary goal of these auxiliary organizations is, of course, the handling of formal, for-record traffic. In this respect, operations are similar to the National Traffic System familiar to many Amateur operators. However, MARS operators are separately licensed by the military, and conduct their operations on military assigned frequencies outside the Amateur bands - usually near the edges of the Amateur bands. Operators are governed by the respective military branches, and differ only slightly from those found on good Amateur radio traffic nets.

RTTY, of course, has long been used by the Army and other services in handling message traffic, so it is logical that MARS operations also make use of this mode to move messages. However, recent innovations sparked by *Mr. Robert L. Warren,* Chief of Army MARS, and those who serve as area directors under his authority, have put a much higher emphasis on RTTY and other digital modes, and have seen some interesting applications of personal computers in other aspects of MARS operation.

To get the full sense of these changes, one must know a little bit about how Army MARS is organized. In the Army MARS system, the continental United States is divided into ten REGIONS, usually consisting of three or more states. These regions are grouped into three areas - the Eastern Area, Central Area, and Western Area. Under normal circumstances, these three areas are administered by full-time Army employees, each with a small administrative staff.

Traffic flows between the continental United States and MARS stations abroad thorough gateway stations. There are gateway stations, operated by the Army using it's personnel, for each of the major military theaters of operation, and for each of the three continental US areas. Message traffic is then sorted by the state, and distributed to civilian MARS operators, called "affiliate members" in each of the several states for ultimate delivery. This is a logical system, and continues to serve Army MARS well. It combines the operation both of regular military stations under Army control and the affiliate member stations at the ultimate delivery level. (Navy and Air Force MARS systems are organized on somewhat different lines.)

When I joined Army MARS five years ago, the system had developed a bottleneck at the level where the messages from overseas were to be distributed by the state-side gateway stations to affiliate stations in each of the states. The operating system was essentially a day-long network, operated in the single sideband voice mode. An affiliate station checked into the net and stayed as long as he could. If there was traffic for his state during that time, it was sent to that station. If he checked out at, say, noon, and traffic came in after that time, it could be picked up the next day.

The problem was the time commitment required by the affiliate stations to make sure they got the traffic destined for their state. This essentially became an eight hour a day, seven day a week job.

Mr. Leon Ritter, the Central Area MARS Director, began experiments in 1984 and 1985 which have led to a virtual complete restructuring of traffic distribution at the area level.

In the new system, messages are broken down to the regional level in one single net, which is quite short for that region. This is followed by another net, during which the region gateway station sends messages for each of the states in the region to a state gateway, who will see that it reaches the station in his state best able to make final delivery. It takes about 30 minutes, maximum to distribute traffic to each state from the region to the state level.

Now, the cynic would say that this system must be slower, because an extra distribution level has been inserted. However, the single facet of the new system that actually makes it faster is the reliance on digital communication at each level.

It was formerly the case that Army MARS nets were not only assigned to certain time and frequency, but also assigned to a specific mode. This is no longer the case on Central Area 75 meter nets. All nets are now considered assigned as "multi-mode". More important, the mode of operation can change within any single net session. On the area and gateway nets, message traffic can now be sent in the FASTEST mode available to both stations and supported by band conditions. This is a major improvement, of course, over reading messages aloud. While a lot of 100 WPM RTTY is still heard, AMTOR and Packet are now being heard more and more.

The experience with multi-mode opera-

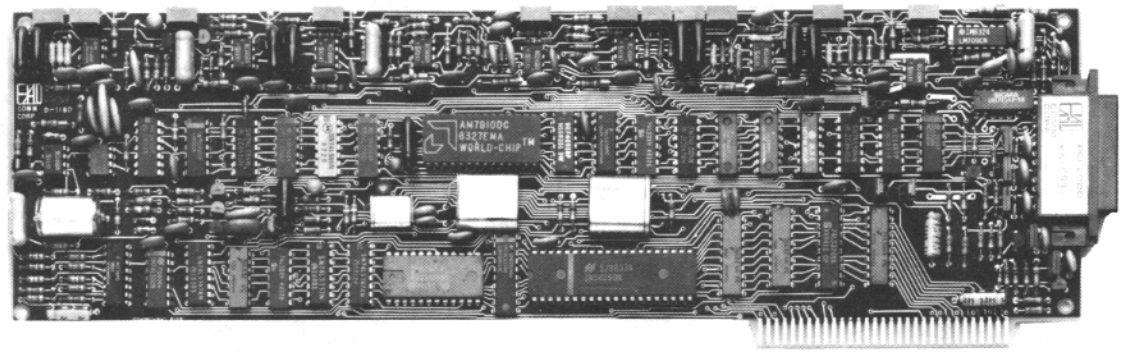
MARS Continued on page 22

COMPLIMENT YOUR PC . . .

WITH THE BEST!

PCI-2000

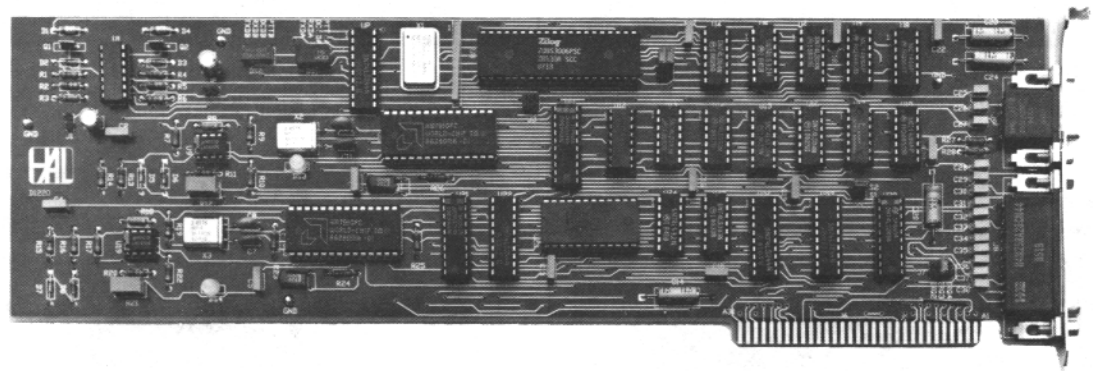
PERSONAL COMPUTER INTERFACE



The PCI-2000 is a high-performance radio communications modem card for the HAL DS-3200 Radio Data Communications Terminal or any fully IBM-compatible computer. The PCI-2000 plugs into the computer just like any full size expansion card and will transmit and receive both RTTY and Morse code. Included on the card is a high-performance RTTY demodulator which includes separate active filters for mark and space, wide dynamic range limiter and detector, and autoprint noise suppression circuits. The PCI-2000 operates at all standard shifts and data rates for ASCII and Baudot and utilizes automatic speed tracking on Morse receive. The software provided offers a high degree of operator flexibility for normal communications as well as for extensive traffic handling operations.

RPC-2000

TWO-CHANNEL RADIO PACKET CONTROLLER



The RPC-2000 is a TWO-CHANNEL radio packet controller that adds fast, error free data communications to radio links. It plugs into an expansion slot of the HAL DS-3200 Radio Data Communications Terminal or any fully IBM-compatible computer.The RPC-2000 uses Packet Radio protocol based on AX.25 to provide data communications at rates from 45 to 4800 Baud.With its built-in modem and RS-232C I/O (for an external HF modem such as the HAL ST-7000 or ST-8000), the RPC-2000 is ready to work on VHF or HF. The software provided is entirely menu driven eliminating the need to memorize complicated commands and procedures.

CALL US FOR MORE INFORMATION AND PRICING ON THE PCI-2000 AND RPC-2000

HAL Communications Corp.
Post Office Box 365
Urbana, Illinois 61801
Phone (217) 367-7373
FAX (217) 367-1701

STEP UP TO THE BEST, STEP UP TO HAL!

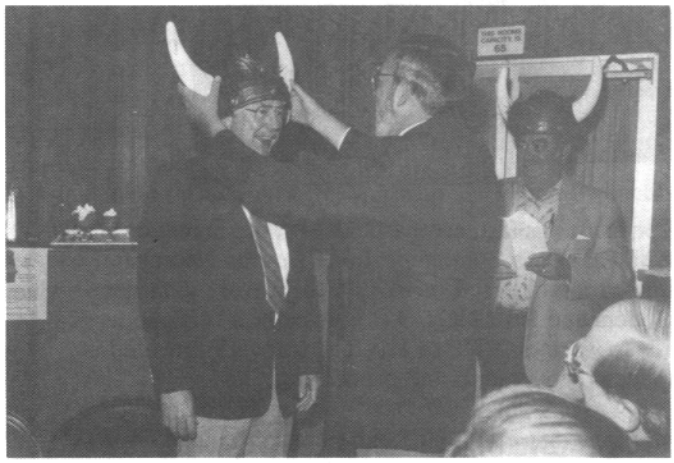
DAYTON HAMVENTION 1989

Digital Digest forum, Dayton 1989. L. to R. Dr Alan Chandler, K6RFK, Bill Henry, K9GWT, Mark Allen, WJ7X, myself (W6IWO), Bob, WA6ERB, John, TG9VT, Vic, W5SMM, Bob, WB7QWG

Dale, W6IWO now performing the initiation rights as administered by able assistant Jerry, WA1IUF. Don't miss this event next year, when some else will replace Dale and represent those in attendance.

Dale, W6IWO taking the oath of the Oh-Wa-Tah Society for all who attended the RTTY Dinner. Adminstered by Jerry, WA1IUF and the Most Noble Bob, WB7QWG. Dayton 1989

Vic Poor, W5SMM featured speaker at the RTTY Dinner. Vic authored the APLINK program and gave all in attendance an outline of how it works. Observing at the right is Bob, WB7QWG and Dale, W6IWO. Dayton 1989



Dale, W6IWO receiving installation of proper Oh-Wa-Tah Society head gear. Installation performed by the Most Noble Bob, WB7QWG with his assistant Jerry, WA1IUF looking on.

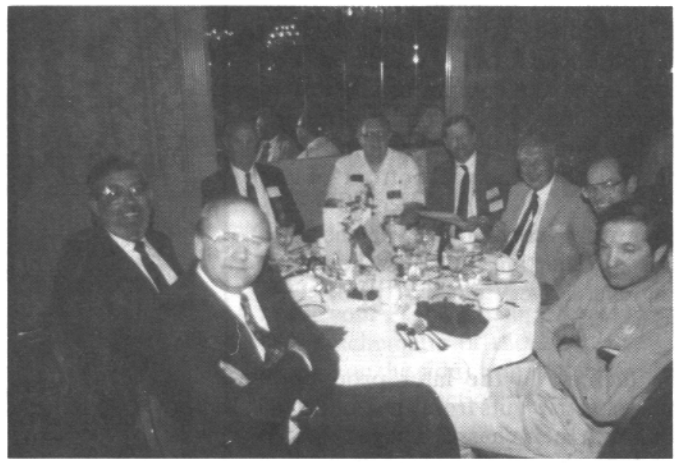
A visit to Bill Henry's (K9GWT) shack. Bill invited Cole, W6OXP and myself back to Urbana for a tour of the HAL facilities. Very interesting side trip after Dayton and an excellent host was Bill and his lovely wife Kathy.

DAYTON HAMVENTION 1989

RTTY Dinner 1989 - Starting left front. John TG9VT, Bob, KC9UU, Bob, WA9AKT, Al, W8PBX, Louise, WB8JIB, Ruth, XYL of Don, Gaylord, WB8ICL, Don, K8WZX, Clark, W9CD

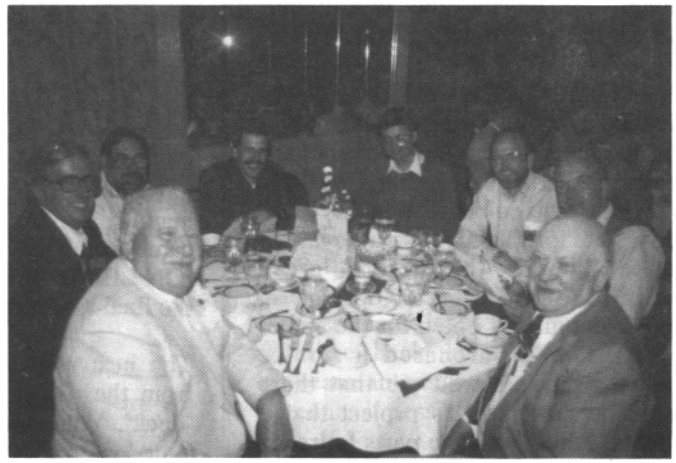
RTTY Dinner 1989. Starting left front. Ron, KP2N, Dave, KP2W, Ted, W2FG, Henry, DJ6JC, Harry, NA2K, Frank, N2FF, Jules, WA2JGR, Ted, HC5K, George, KB2VO

RTTY Dinner 1989. Starting left front. Dick, K0VKH, Rich, KC0KT, Jerry, WA1IUF, Bob, K1UOL, Jim, KS0PT, Bill, K9GWT, Drew, K9CW, Jay, KB0ATQ, Jay, WB8ZTY



RTTY Dinner 1989. Starting left front. Frank, WA1URA, Bob, WB7QWG, Vic, W5SMM, Cole, W6OXP, Mark, WJ7X, Arthur, XE1LL, Mel, K0PFX, Curt, W0SN.

RTTY Dinner 1989. Starting left front. Ken, KS9I, Don, N9ALK, Tom, WA8RWQ, Bill, K2PEQ, Tom, WA8DXD, Tad, KT7H, Luis, XE1L, Joe, W3HNK



RTTY Dinner 1989. Starting left front. Bob, VE3JAN, John, N7BTI, Tom, KJ4D, Alan, KA1MTQ, David, KB1PJ, Mike, KJ4LN, Ed, AA4TH, Ray, VE3UR.

REWORKING THE HAL DVK-3100 MONITOR

by Al Kaiser, N1API

After many years of fine service and being unable to find someone who could repair my monitor locally, I found it necessary to replace the display on my HAL ASR-3100 terminal. The CRT was getting dim and attempts to repair a blown power supply a year ago left me with a wavy fluttery screen which lost sync anytime the power or data was lost then restored before the unit had a chance to cool down.

Normally the best thing to do would be to send the DVK-3100 Monitor back to the factory for repair and have it fixed there, but this monitor was the older "Electrohome" monitor and has not been produced for a few years now. You could hook any composite monitor to the system but because of the monitor's masking you will probably lose 2 to 3 lines off the top and bottom of the screen. The HAL sales and service people were very helpful giving me some leads in getting an assembly which fits in their chassis very nicely, (thanks Don and Mark).

The factory, in the later production units, used the "guts from an Amdek 300 monitor in their chassis. They suggested that I purchase a new Amdek 300 and build it into the HAL chassis like they did. Unfortunately the 300 has been out of production for about a year. My next choice was to buy the "guts" of a monitor and put the thing together myself.

I soon found out this would be a wrong choice. First of all, being out of production, the parts for this unit are very hard and expensive to get together. I was able to procure a video board, new CRT and also a yoke for the CRT. You do have a choice of either the original "green screen" CRT or you can opt for an "amber" monitor. I opted for the amber screen. I also purchased a service manual which showed me that there would be more to this project than I thought. Along with the parts I already had I still didn't have a power supply, switches and wiring harness to put all this together. The parts were available, with some delay but the price for all this would put the complete assembly at about three times the price of a finished unit.

So I did what I should have done in the first place. A short "help" message on my Packet PBBS found a used monitor at a very reasonable price close by, (thanks Dana). I decided to use the parts from the replacement as the display looked bright and new.

The following procedure will show you how to rebuild your own monitor:

DISASSEMBLE THE DVK-3100 MONITOR

1. Unplug the DVK-3100 monitor from the DS-3100 ASR terminal
2. remove the four cover screws and DVK cover
3. Remove the monitor from the terminal

4. Remove the "mask" from in front of the monitor
5. Unplug the connector from the power plug and unscrew the brightness control from the back panel
6. Unplug the "data" plug from the video board
7. Unscrew the monitor deck from the HAL case so you have the sub-chassis free
8. Remove the video board, CRT and power supply from the deck. Make sure you save the power supply as you will need the power plug later

DISASSEMBLE THE AMDEK MONITOR

1. Remove the back cover (6 screws)
2. Remove the video board and power supply in one assembly by unplugging the CRT and unscrewing both the "ON LED" and switch bracket assemblies. I do not recommend unplugging any of the plugs except the ones going to he CRT and power transistor unless you have either a schematic or service manual. You may wonder where they all came from later! You can unplug the "ON LED" board, it will not be used in the final assembly.

The next step is to mount everything from the power supply onto the HAL "deck". You should get a fuse block at your local parts store for either 115 or 230 volts. For 115 volts tie the red and orange wires of the primary together. If you prefer 230 volts tie the red and yellow wires together.

Now remove all the parts from the Amdek power supply. Don't cut any wires just leave everything together. You will still be attached to the video board so be careful while working with the assemblies.

Start to mount the power supply parts on the HAL deck. Mount the power transformer. There should be plenty of room to mount it on the left side of the board looking at the assembly from behind. Mount it far enough forward to leave room for the fuse block, power transistor and the HAL power plug. Next find a place for the fuse block and mount it.

Finally mount the power transistor. You should place it in back of the transformer for ease of service.

Mount the video board. This part is a little tricky. There are five controls on the board but they are seldom used. You can punch holes in the back cover later if you wish to have access to them or take the top off if necessary to adjust them. I used 5 X 32 threaded standoffs 1/2 inch high. Be careful here as you need to mount the board as far back and as low to the chassis as you can for the CRT to clear the large plug for the controls on the front of the board. If you position the board correctly you will need to drill only two holes as there are two large square holes in the chassis that you can block up with flat washers.

You now have all the components on the sub deck and it's time to put the CRT in. This is the easiest part. In installing the CRT you can scrap the mesh glare screen from the Amdek. It is not needed and makes cleaning of the screen hard. there is also a 3 "finger" static ground for the CRT that you can use if you wish. You will have to do some bending and drilling to mount it though. Do make sure you mount the CRT as high as possible on the support brackets to clear all the high components, it is tight under the CRT.

The next step requires some cutting and filing on the back of the HAL case so for this step remove the panel from the case. You will have to mount the brightness and Contrast controls there. Unplug the controls from the video board and remove the two pots from the bracket

Continued on page 16

PACKET Continued from page 7

ms. The connections on the back of the radio allow one to send a signal direct to the modulator and extract a signal right off the discriminator (Foster-Seeley or ratio detector, I have no idea). They claim that the radio will directly support 9600 baud operation because of this. With the external mic jack on the back, the radio can be used as a voice radio also. The radio has so far not received approval from the FCC but when it does, the suggested retail price is around $200.00.

It apparently looked like there was not much new at the convention. Evidently there is a lull in original product offerings this year. Maybe something will come out of it for next year. I would like to see the radio manufacturers bring out a low cost, SIMPLE radio like the above mentioned radio by Kantronics except with a synthesized tuner.

Personally, I think the big hit of the convention for me was being asked by Spud, K6KN, concerning a DXpedition for a contest coming up soon. I told him that if I had the money and the time I would love to go and bring the XYL and Harmonic but it was not in the cards on my end. Shucks. I would like to tell where they are going but I am not going to let the cat out of the bag as to where they will be, those lucy devils!

HODGEPODGE and LEFTOVERS

WA7EGA evidently needs some #1 bird shot to get rid of his infestation of birds. I think he has lots of company in this respect. This system here generates a whole flock of the little beasties in my HF radio and I can honestly say that there are too many birds on my antenna. 10 meters is practially useless half of the time with them and the way the sunspots have been, I have been pulling out my hair. My best DX lately has been Georgia and Florida on voice, not digital. Enough about my troubles with short skip DX. As the computers get faster and faster, the problem of birdies will not go away. The best way to help combat the menace is to use a good grade of components, boards rated FCC class B, a metal case, shielded cables and a GOOD GROUND. The video cable is quite guilty here because it is digital and not analog and in the case of this hodgepodge, it is unshielded and twisted to boot. So, good shielding and grounding will always pay off and help on the problem.

SOMETHING NEW

There is a new program that is making its way around for the Apple's. It is YAPP for the Apple. The name of the program is APR and it is currently at version 2.0. It is available from:
Paolo Viviani C.So Bruelleschi 36
I-10141 Torino (ITALY)

Paolo is requesting $5.00 U.S. for a 5 1/4" or $6.00 U.S. for a 3 1/2" disk. They will be recorded using the Apple ProDOS format. After using the program, he is also requesting user feedback on the program so he can improve it.

MAIL

I received a letter from Bud, W6RUX, in the Los Angeles area. He was telling me about a problem that he has noticed and I did some checking into it myself and I have to agree. Admittedly, people like to go where they please and that is true of the ham bands as well. What he is saying the subbands do not mean much when it comes to operating on 20 meters. He was on RTTY below 14.090 MHz in QSO with someone and was interfered with by Packet on the frequency that he was on. I thought that Packet was to be above 14.100 MHz but I guess not. I have a feeling that what we as hams have abided by when it came to subbands to keep the disciplines separate and followed by gentleman's agreement does not hold water with people who use Packet on HF. SAD, REAL SAD. At least I honor subbands and I have no complaint with them. They are there to spread the wealth around and keep everyone happy. Why did everything seem to go fine until Packet came on the scene? Think about it.....**de Richard, N6NKO**. Mail to: N6NKO@WB6YMH-2; [44.16.0.114]

PC BIRDIES Continued from page 8

"Turbo-XT" models, at least in "Turbo" mode. They run a faster clock - you guessed it - more RFI!

9. If you have a choice, buy a PC-XT that has a 4-layer "mother board". The standard PC-XT has a double-sided (2-layer) circuit board. The 4-layer board uses the inner two layers for ground and power supply traces. The whole circuit board then acts as a large distributed capacitor and the fast logic signals are much better contained. The 4-layer board is much quieter than a 2 - layer board. The difference can be as much as 20 dB!

10. If you still have RFI after trying the above, consider rebuilding the computer into a cabinet that is well shielded. This is not an easy task, but it can give some very gratifying results.

11. Don't neglect the PC power supply. All PC's use switching power supplies . They have to. We could not stand the heat or physical size required for a "linear" power supply. "Switchers" are notoriously noisy, usually shown by noise conducted or radiated via the power cord. Practically all PC power supplies now have AC line filters - they have to to meet FCC RFI spec's. However, these included filters are also "bare minimum" gadgets. There are some very good RFI filters to be found in hamfest surplus bins. What you want to look for is a medium current job (less than 5 amps) that is also large - at least larger than the little bitty thing you will find inside your PC power supply. If you can find a schematic of the filter (may be printed on the side), you want a two-section or three-section job. A better power line filter can go a long way towards quieting your PC.

Well, that's my list for things to do to the PC. Those are the guidelines HAL followed when we designed our DS-3200. It is not cheap to do, but some or all of the above steps may be essential if you really want to use your PC around HF radio equipment.

There are also a number of "commonsense" things that make the RFI problem a lot less. These include using a good RF ground system in your shack, using coax cable rather than open-line or twin-lead feedlines, locate the antenna away from the shack, and use horizontal wire or beam antennas rather than vertical antennas if possible.

I hope the above ideas help. This is the "computer revolution". Somehow, we have got to make computers "friendly" to our RF gadgets. Otherwise, we might as well turn off the radios and play "Space Invaders"! **de Bill, K9GWT**

The recent focus on contesting ethics has fueled the imaginations (and the consciences) of a few of our well-known RTTY competitors. Of course, since RTTY operators are by nature too shy to come forward, I have excercised a bit of poetic license by anticipating their concerns. With a little reader support, I am sure that we can obtain answers to the ethical questions posed by the following survey:

The call signs of the stations who might have submitted the questions were omitted (to protect the innocent). Naturally, any resemblance to actual RTTY contest operators is coincidental.

RTTY CONTEST OPERATING ETHICS SURVEY

Do you have a license?_____.
(Signify NO by entering a string of RY's.)

Do you operate hi-power?_____.
(If YES, list the burned out parts. Extra space on reverse side.)

Years of contest experience?_____.
(Count from the earliest date of threatening phone calls.)

1. Is it unethical to coerce a language teacher into helping to improve my South American QSO rate? --Don in LA

2. In mid-January, is it ethical to require a co-operator to assist in antenna repair when it was the stupid main-op who forgot to install vibration dampening ropes in the elements? --Pat in WA.

3. Is it unethical to attempt to inflict damage to the body of a civic- minded operator simply because he awakened the main op to inform him that the vital-to-contesting, pastrami supply had been exhausted? --Jay in WA.

4. It is ethical (isn't it?) to wear white shoes to an antenna party? --Roy in MA.

5. Do parasitic oscillations caused by nails in my wooden tower constitute a violation of the ONE-SIGNAL-ON-THE-BAND rule? -- Carl in KS.

6. It should be unethical for the DX to work JA1ACB before he works me since Gin wasn't even in the contest! --John in Central America

7. Is it unethical to arbitrarily send twice the received QSO number to demoralize big-gun, showoffs (like WA7EGA) who are a 100 QSOs ahead of everyone else in the contest? --Wipped in LA.

8. When you are winning the contest, it surely must be ethical to use a Walther P-38 to intimidate loud-mouthed neighbors who complain about TVI. --Earl in WA.

9. Can you exceed the 30-hour operation limit in the BARTG as long as you don't have an official copy of the rules? --Ted in South America

10. During a multi-single operation, if the amp is considered part of the antenna and the computer can switch the VFO memory and the antenna six times per second, is it ethical to multiplex the buffers so you can call CQ on five bands at once? --Hal in WA.

11. If you are forced to load your 40 meter dipole on 80 meters, can you count any 80 meter QSOs on both bands? --Vance in LA.

12. If a Chinese dinner in a particular DX country is more than two times as expensive as the same meal in the USA, can multipliers worked from that location be counted twice? --Eddie in CA.

13. Nobody should ever be allowed to run that much power! --Ron from Down-Under.

14. Giving 599 reports should be unethical. Any station who has to ask for three repeats to confirm his 358 RST, probably deserves it. --Bob in Okinawa

15. Is it ethical to add amplifier repair time to the operating time at the end of the contest? --Bill in AK.

EXTRA CREDIT QUESTIONS

16. In the middle of a two-hour European run on 14095, a well-known W1 begins sending a bulletin on top of you. You would: (a) Slowly QSY while sending a steady CQ in the hope of dragging the pile-up along with you (the famous Moscow-drift maneuver.) (b) Turn the beam farther north, add fuel to your water-cooled finals and push on regardless. (c) Add 4 oz. of lutefisk to an envelope containing your ARRL membership certificate and mail it to Connecticut.

17. During the last 10 minutes of the CQ WW, a familiar Cuban station calls you for double muliplier credit. You have been trying to get his QSL for six years. Along with the exchange you ask him about all the green stamps you sent him and inquire about the hole in the bottom of his mailbox. When he doesn't come back, do you put him in the log anyway?

18. Would you knowingly take over K6WZ/0's frequency if WZ was S2 and the BY4 he was working was 20 over S9 or would you apologize first.

19. If you were calling CQ and W6PJR dropped by to tell you that ZA1ZA was on 21085, you would: (a) Remind him that you are single-op and not allowed to accept help from spotters. (b) Thank him for his help and go on calling CQ (c) Enter a note in the log saying that ZA1ZA would not count since you had received the information in an unethical manner. (d) dislocate your wrist on the VFO knob.

20. Have you ever been a whole week late for a contest and contemplated back-dating your log a little? (It could happen to anybody.)

Good luck in the CQWW. The gang from Spokane is back to El Junco on San Cristobal Island (HC8). See you on the bands! **de Hal, WA7EGA**

DVK3100 Continued from page 14

remove the two pots from the bracket they are attached to. Use the bracket as a template to transfer the location of the holes from the outside of the panel. Mount them in a suitable location.

The final two parts to connect are the BNC connector and the power plug, do the BNC connector before you put the back panel in position again. Clip the old wires from the HAL BNC connector and prepare it for new wires. Unplug the data line from the Amdek board and clip the wires at the phone connector. Prepare the wires and re-attach to the BNC connector on the back panel. Re-attach the panel to the HAL case.

Salvage the 3 pin power supply plug from the old HAL power supply. This will be connected at three places as follows. Solder the black wire to one side of the fuse. Clip the power cord wire from the Amdek fuse strip and solder it to the new fuse block on the HAL. Next solder the wire from the plug to the switch post that still has the other side of the Amdek power cord attached to the chassis.

This finishes the wiring of the monitor and all you have to do is to plug everything back in and put it all back together. Before you place the top on, check your work to make sure that everything is correct and that all plugs have ben re-connected at the proper places. Also make sure there are no stray pieces of hardware left in there to cause a short circuit. Once you are sure of this you can button everything up and enjoy your nice bright crisp display. Remember you now have a switch to turn the monitor on and off and I found this to be the biggest advantage of this monitor. **de Al, N1API**

ED: Thank you Al for this nice article. Those interested in more info from Al, may contact him at 194 Glen Hills Road, Meriden, CT 06450 or via Packet.

DON'T BE A BEACONITE!

DON'T BE A BEACONITE

DX NEWS

John Troost, TG9VT
POB 296C Vista Hermosa
Guatemala City, Guatemala

OFF TRAVELING AGAIN

Here it is 3 September and I am trying to get the DX Column together, but have to rush, as I am off to New York and Boston tomorrow; thought it was time to get my head examined. Sure plan to be back before the CQ WW RTTY Contest; have to hold up my honor; will try Single Operator All Bands this year; seems I will have plenty competition, amongst others, from my old partner, Jules, W2JGR, who will operate from the station of HC5K, while HC5K and his gang is going to try and set a new record from the Galapagos. But they will have serious competition this year from UP, Lithuania and from UQ, Latvia (see letter from UA9FBV this issue pg. 19).

George Wesley, KB2VO was here with Maj-Britt for a week in early August, and he operated from TG9 and TG4, then off he went to Ecuador and the Galapagos Islands and had all kinds of hair-raising adventures, such as loosing power on the boat in the middle of the ocean, and finally ending up in Quito, in the belly of a Hercules military transport.

MAIL

Had a few letters during the month, one from Bill Henry, K9GWT, the pioneer of digital Modulators/Demodulators. Bill re-emphasizes the need for the use of a **Synchronous Idle (Diddle)** on RTTY to keep the digital gear in rhythm; it is just as essential now, as in former years of Mechanical Machines. Also Bill says that he made his RTTY gear now incapable of transmitting RYRY, and why should it be? After all everyone gets sick of RYRY on the screen, **most people know their own call**, so why not send **YOUR CALL** instead of RYRY! It does just as good a job of synchronizing without getting everyone upset..

Also Bill refers to a very important point in digital communications; **frequency read-out**, especially now that we all have digital dials, which read differently on each make of radio. In the RTTY position, on FSK, some transceivers will read Space tone, some Mark tone, and some the LSB frequency for high tones of 2125/2295 Hertz. The frequency standard for Digital modes is the **MARK Frequency**. Know your gear and know what the read-out should be, to land you on a certain Mark Frequency, because if you made a sched for 14,090, that is the Mark Frequency, even though it might read 14,092.1 on your transceiver. The best way is to have a frequency-counter handy (calibrated against WWV) to check what your readout really means. That will give you the Mark Frequency, regardless of what the "zillion digit display" shows. Get to know that offset for your particular gear and it will then mean something to you when someone tells you he will meet you on 14,090.00 Mark, or that the new TG9VT Aplink Mailbox is on 14,074.00.

And a lot of mail has come to the Publisher, requesting QSL information. If you need a QSL route, there are two good ways of getting your answer. First is the **INDEXA** Net on 14,236, every day but Wednesday, at 23:30Z. That is what they are there for, to help needy DXers with info, and they are good. The second way is to subscribe to the incomparable **"GO-LIST"**, the "W6GO/K6HHD QSL MANAGER LIST", published by Electronic Enterprises, POB 700, Rio Linda, CA 95673-0700 and it is only $20 for 12 monthly issues; I pay $30. - for overseas airmail.

RECENT HAPPENINGS

The month of August proved to be pretty fluky propagation, and even in the SARTG contest not a lot of great DX was seen (sorry George), but all in all, during the month, there were some fine stations up from rather rare places, such as HV3SJ, practically every weekend, YI1BGD, HH2BZ, C31LHK on AMTOR and Baudot, KB2VO from TG9, TG4, HC8, HC5 and as HD6S, HB9DCQ from ZB2 and A3, DF9GR from HB0 on all bands (at least I worked him on 40 and 80), HZ1AB with new gear, N2HNQ/KH8, SU1EE, TJ1DL (mainly AMTOR), TJ1MW, 9J2AL, V85GA, 5V7DP, 6W6JX, JT1KAI, FR5ZD on AMTOR and Baudot, RM8MA/RM5Q, 9Q5XX, UA3TT/RF1F, ZS3GB, JY9IU, RL8PYL, J52US, Z21FB (on prearranged sched), P40MA. And every day more and more stations from the USSR are on RTTY, from zone 16, 17, 18 and 19, a great pleasure to see them!

DX COMINGS

There is a strong and persistent rumor that **LIBYA, 5A**, no call-sign known yet, will be up in early September; hope he waits till I get back on the 14th.. Hi!

5Z4BH, Rod, has now Tono and will travel, and plans to be up in the CQ WW RTTY Contest from **RWANDA**, as **9X5AA**. He is still fighting for a **BURUNDI, 9U5** license, but as yet no luck. Also, he still hopes to be up from **T5, SOMALIA** one of these days. Pray for Rod!

As I am writing this, **ZS1IS, WALVIS BAY**, has not arrived on RTTY yet. But that should be a sure one for a new country, with the recent independence of Namimbia. He is expected up on RTTY at any moment during the current DXpedition of KC1AG and his group.

J52US, after a bang-up job from **GUINEA-BISSAU** is now packing up. But don't worry, by year-end he will be back from **SIERRA LEONE, 9L**, no call-sign yet.

W6/G0AZT, Eddie, and AA5AU, Don, hope to be up from the **BAHAMAS, C6A**, during the CQ WW Contest, if their license finally comes thru, now requested over a month ago. They too need your prayers.

And looks like we will have quite a few interesting stations during the Contest: W2JGR will be **HD5Z** from the QTH of HC5K. And HC5K and a group of US and Ecuadorian operators will work Multi from the **GALAPAGOS**, to make use of the gear so recently tested and burned in (out) by HD5S, George, KB2VO. Also, we will have a Multi-OP stations from **LATVIA, UQ**, by the UZ9FWA group, as well as

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LITHUANIA, UP, by the group from UA3PW. (See letter of UA9FBV in this issue) And then there is **Tom, OD5NG** from **LEBANON.**

The **CAMAROONS** continue to be pretty active on RTTY and will be very visible for at least a year **TJ1MW** tells me, but **TJ1DL** will QRT from there in November of this year. TJ1MW is very active indeed, normally around 2300Z, just before he goes to bed: good job Mike; Mike is N4MUJ, which is also his QSL address and he uses a 5 element beam and PK232, latest version, which gives him the "diddle".

Luis, S92LB, now has all his gear, and Tom, PY2FR has been trying to reach him to give him final instructions, so that he will go on the air, but Luis has been hard to find by Ham radio, FAX or phone. Should you see him on SSB or CW, please tell him that PY2FR is waiting for him to give him all the instructions he needs to go on RTTY with the gear Gin San, JA1ACB and Luciano, I5FLN donated to him. **SA0 TOME** will be an **All Time New One**.

And we are still hoping that Raimo, OH3BGD will come up from **ZK3, TOKELAUS** in October or November.

As to **OSASAWARA**, seems that all plans have come to naught. 7J1ADJ has mysteriously disappeared, but I hope Joe is well. And Toru-San, JG1RVN is completely tied up with making a living for him and his family and is not liable to go anywhere for a while: pity, a great DXpeditioner. Hope he makes a lot of money quickly and gets back to what he is best at. Hi!

VE3JPC reports that it does not look like he will be able to operate from **SENEGAL**, but hopefully the other planned countries he intends to work in Africa will come off, like **MUARITANIA, GABON**, the **GAMBIA** and possibly **LESOTHO.**

Of course we still look forwards for the gang at RL8PYL to activate **XU, KAMPUCHEA (Cambodia)** and/or S2, BANGLADESH later this year: excellent Christmas present, Alex: do both of them and you will win any popularity contest!

And the gang at UA3TT still has the DXpedition spirit, they are now talking about another trip to **UG, ARMENIA** and **UH, TURKOMAN** very soon. Hope they will get to their QSL chores also, those are a "bit" delayed.

And, finally, there is now a Packet BBS at the Moscow University Technical Club, and they transmit a bulletin that an Award is available for a QSO with five of their members.

ST. PETER AND PAUL ROCKS

I received a very long letter from **Karl, PS7KM**, regarding the **NATAL DX Group's** recent expedition to **ZY0SY.** It is some 12 pages, so I can just give you an extract.

The "ROCKS", and that is what they are, are located about half way between Brazil and Africa. From 10 Miles or so they become visible and look like one small Island. But from 3 Miles away one can see that they are a group of volcanic rocks sticking up above the water, with a total circumference of no more than half a mile. This is surely one of the most difficult and hazardous places in the world to set up a Radio Operation. Temperatures run about 45 Centigrade during the day and rain and wind storms are frequent. No vegetation or drinking water. No place for a vacation.

But three intrepid Brazilian Operators set out to conquer this place and work all modes, all bands and were successful in making 6,325 QSO's from 14 to 20 May '89, of which 46% were with North America. The gear consisted of 5 transceivers, and a tri-band beam and various other antennas for 10 thru 160 Meters. Plus a 1400 Watt generator and for RTTY there was a Commodore 64 and MID-1000 interface.

RTTY operation started late on 17 May, but after 37 QSOs, during the last one (with JA1ACB), at 0016Z on 18 May, the computer failed. It was impossible to get it going again and is still not repaired, neither is the modem, which gave up the ghost at the same time. Anyway, 11 countries on RTTY, and 26 of the 37 QSOs with North America.

Also a few of the transceivers and the RTTY gear were badly damaged by rain and by sea water. Expenses of this little venture were staggering, the boat charter alone was $3000, not including cost of skipper and crew, food and drinking water, fuel and so forth and so on. Plus the loss of much of the gear, which, in the first place, is not easy to come by in Brazil. Fortunately the only personal injury was that Karl fractured his toe. Well, even though the Rocks are small, they had to move the operating location many times to minimize the effect of wind and water.

One would think that these guys should be tired of these "little" ventures, specially after doing such a very fine job the year before from **TRINIDADE**, but no, they are planning a return to **TRINIDADE,** with 2 ops, for 8 weeks in June 1990, and after that, another trip to the **"ROCKS"** with 5 operators in May 1991, for 10 days. They plan to make up for the lost RTTY time, but they need the loan of decent gear for that, preferably a TONO 5000 EXL (are you listening Gin-San).

There are many of us who did not make it on RTTY, and no-one is more disappointed by that than the NATAL Group. They want to make up for that, but help is needed. Maybe the Telereader of the West Coast RTTY DX Association would do?? But sure that JA1ACB can come up with a Tono, on loan, subject to the hazards of seawater and rain. **MUITO OBRIGADO!**

BANDPLAN

The extract from the ARRL Packet newsletter, "GATEWAY" on which I commented last month, has set off quite a storm of comments. (See letter by OD5NG in this issue). There is no doubt that there is insufficient space available under the "gentlemen's agreement" for digital mode frequency allocations. HF Packet is hard enough and sensitive to QRM and not enough space is available in the .100 - .110 portion of the band. But the answer is not "appropriation" of a segment of the Baudot portion of the band, like now is happening on 14,095 and even as low as 14,091. There is even a "closed" net on 21,096.2 Mark, where you cannot break in to tell them to go up to the portion above 21,100, where, after all, there is plenty of space available. Basically, the upshot of comments I have

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received, is that the CW portion needs to be decreased by 20 Kc, i.e. from .000 to .050, 50 Kc on each band, and that AMTOR should be expanded to 20 Kc, and RTTY to 30 Kc and that Packet should be permitted to occupy 20 Kc above .100.

I am sure the last word has not been said on this, but your comments would be highly appreciated, not just to the Journal, but to your National Radio Societies, who are the arbitrators in that important field.

But I would say that the vast strides in digital communications technology and usage during the last few years, have made such re-allocation of the amateur spectrum a necessity.

CIAO

The Fall Season is upon us, and with that better propagation. Hope that each of you catches the Countries you have so long been looking for, plus complete your WAZ on RTTY.

I also hope that I have given you some food for thought, as regards the needs for BANDPLAN regulation for Digital Modes and as regards supporting the next operations of the NATAL DX Group.

Thanks for much of the input this month go to K9GWT, I5FLN, VK2SG, W2JGR, KB2VO, OD5NG, W6/G0AZT, W9CD and of course PS7KM (ZY0SY). Could not write the column without you, nor without my M. S. Word and Spelling Checker as many of you who work me regularly on digital modes will have noticed..

If you want to pick up the weekly up-to-date DX news, edited by VK2SG, lift it from my new APLINK BBS: link TGVT on 14,074.00 Mark, it will be up 24 hours a day from early October on, when our thunderstorms season is over. Till then only from 0000Z to 1300Z

God Bless you all and stay clear of the Beacon Mailboxes if you want to make any DX contacts, as I am sure you do, otherwise you would not have gotten thru this column this far.

73 and Good DX **de John, TG9VT** (sometimes TG4VT)

Letter from Alex, UA9FBV to John, TG9VT (See DX Column)

HELLO FROM PERM-CITY USSR!

Dear John, We have printed UL0P QSL cards at last. Excuse me for a long time of printing. It was some problems here. Hi! Now the QSLs have been sent for all who requested via RV9FQ our QSL manager. Each Ham, who need it, can sent SASE to us via the same address of RV9FQ in Callbook, or via my POB 0093, Perm-city, 614000, USSR. We will answer with pleasure, it is not a problem now. And, like a warning; we can say that QSL via Box 89, Moscow is a very long way in time, and all IRC's can be confiscated.

For information we are planning to work in 1989 WW RTTY contest from UQ-land. It will be very nice of you to publish this information in RTTY Journal. The QSL must be sent via RV9FQ (Box 577, PERM, 614022, USSR) or to me (POB 0093). Maybe we will be more lucky on results this year, than in last one. Hi!

As we know there are not any RTTY stations in this region and maybe after our journey, they will begin RTTY, like RL8PYL (and therefore- 3W0A) did after our UL0P DXpedition. And by the way, if it is interesting, we can send you a little videofilm (on VHS, European standard) about our UL0P DXpedition (without color of course). Our friends: RA3PW, UA3PW, RW3PW (PW-Group) are also planning to take part in this contest, but from UP-land.

As you can see, we are trying to increase the RTTY activity in the USSR and for the same purpose we, together with friends from Barnaul-City (RA9YD) UA9VE, e.s.) have organized the ACDXA (Advanced Communication DX Association) that is intended for development of RTTY and digital modes in USSR and support the Amateur Communication around the world. (Address for information about ACDPC is: POB 1, Barnaul-City, 656057, USSR.

That's all now.. we wish you best of luck and prosperity.. good bye, dear John. Thank you.

de UA9FBV, Alex Tuev and friends:

This recent letter to John Troost, TG9VT from Tom, OD5NG clearly emphasizes that our current band plan problem is also an International problem. Please take a minute and read Tom's letter.

BANDPLAN (LACK OF)

We do badly need a better band plan, but not one arbitrarily arrived at by a small selection of users. It must be an Internationally agreed one by all parties, in the meantime, RTTY Baudot has only 20 Khz of the band, and even this is often blocked with commercial traffic, then below that we have AMTOR with even less (10 Khz), followed by CW with 70 Khz.

One adverse effect I have noticed is that Packet is coming lower and lower into the Baudot segment and consequently the RTTY DX stations particularly are also having to move lower into the very small segment used by AMTOR. I do feel rather strongly about the encroachment of Packet into the Baudot segment and personally feel that until some agreement is reached Packet should remain in the slot just above the RTTY section.

Packet is not the only growing mode short of space as AMTOR is very much in a similar position and my own personal opinion is that Baudot/AMTOR/SSTV/FAX should all have a reasonable amount of space. With Baudot/AMTOR/ Packet having 20 Khc each, I also do think that CW could be moved down by say 20 Khz to make space for Packet combined with FAX and that AMTOR occupy the next 20 Khz and Baudot the next 20 Khz.

I stress that this is a personal opinion and I know there will be many in disagreement as well as in agreement, but time is running out, we must sort ourselves out in an orderly manner.

73's de Tom, OD5NG

DON'T BE A BEACONITE!

MSO'S

Dick Uhrmacher, K0VKH
212 48th ST
Rapid City, SD
57702

HI Gang! Having just returned from two weeks in the wilds of Northwestern Montana I feel revitalized a bit! Much has been going on in the world of RTTY, and I hope that you are having a nice Summer. It won't be long now an Ol' Man Winter will be making his presence felt, so now's the time to spruce up those antennas and other outside projects.

17 METER BAND AMTOR MSO

I received a very nice letter from Russ Tower, K1DOW/4, of Arcadia, Florida. Russ would like everyone to know that Henry, K4CZ, in Lexington, Kentucky, is now running a AMTOR MSO on the relatively new 17 Meter band. Henry's system can be found on 18.089 MHz, (Mark frequency). His access code is KKCZ, and he's using the popular HAL Radio Communications format. Once the link is established, typing "CZZW +?" (without the quote marks), will provide user with a Help Menu. Good luck to Henry with his MSO, and let's hear from others about systems on the new bands.

Russ also ran into ex-MSO SYSOP Dick Schulte, WD4MTC, recently, and reports that Dick and Sandy are alive and well, enjoying travelling around in their motorhome. Evidently Dick is maintaining the state of the art, even having a cellular phone in the "palace on wheels"!

Russ tells that he's pleased with the addition of TG9VT as the "DX Editor" for the "RTTY Journal", and really enjoys his style of writing. I agree with him fully. Keep up the good work John!

MSO/APLINK SOFTWARE

Clark, W9CD tells me that his MSO software package has now been updated so that is will run on the AEA AMT-1 equipment, (as well as on most IBM PC's and clones). Clark states that the AMT-1 is the preferred converter for use with Vic Poor's APLINK BBS software. He also found that Burghardt's Amateur Center in Watertown, South Dakota, has (or had) a supply of reconditioned AMT-1's, for a reasonable price for this RTTY/AMTOR converter.

MSO MAILBAG

Along with Russ Tower's nice letter this month, I also received a nice letter from Mr. Wen Pei Lin, from Changhwa, Taiwan, Republic of China. In his letter, he poses several questions, which I hope to provide an adequate answer for. Wen Pei Lin is 26 years old, and a newly licensed Amateur Radio Operator, whose interest lies in the RTTY/Digital area. He feels like he is a little green on RTTY matters, but from the questions he poses, I think he already has a good background.

First of all, he asks, "What do the letters 'MSO' stand for'? They are an abbreviation for "Message Storage Operation", a term that the HAL Communications Corporation has applied to their very popular DS-3100 RTTY system. The "MSO" portion of the DS-3100 is an electronic mailbox, where remote users read, write and delete files.

Tuning to your favorite MSO !

Secondly he asks, "Is the National Autostart Frequency" (MSO Group) always on the same frequency"? And the answer is, "most of the time"! Although we advertise that the MARK frequency is 14 085 625 Hertz, we attempt to keep our equipment within five (5) Hertz of that frequency. Most of the newer transceivers, particularly the Kenwood TS-940S, seem to stay within that parameter. Some of the older equipment does drift a bit, and requires a bit of "fishing", but generally speaking if you are able to send the MSO access code within thirty to forty Hertz of 14 085 625 Hertz, then you'll activate the system.

Wen Pei Lin asks several questions relative to Mark and Space frequency readouts on different transceivers, and hopefully I can provide a little insight concerning the matter. First of all, RTTY'ers have traditionally used the "MARK" frequency over the years to describe where they were transmitting or receiving in the spectrum. When using "high" RTTY tones, the Mark tone is 2125 Hertz lower than the Carrier frequency, and the Space tone is another 170 Hertz lower than the Mark Tone, (or 2295 Hertz lower than the carrier frequency). Now comes the confusing part! Almost each and every transceiver, both within brand names, and certainly between brand names, uses some different method of displaying what frequency you are receiving on the transceiver digital display unit. For example, here are some specifics concerning the National Autostart Frequency, that I will apply to the Kenwood TS- 940S, and the TS-440S.

The NAF "carrier frequency" is 14 087 750 Hertz. Located 2125 Hertz lower than that is the "Mark" tone, at 14 085 625 Hertz. And finally, another 170 Hertz lower than the Mark tone is the "Space" tone, at 14 085 455 Hertz.

If you want to receive the National Autostart Frequency with the Kenwood TS-440S, in either the "FSK" or "Lower sideband: modes, you must make the digital readout read 14 087 75. In other words, the TS-440S digital readout reads the "carrier frequency" when properly tuned to the National Autostart Frequency. If another MSO system advertises their frequency by describing where the Mark tone is, then you must add 2125 Hertz to it, to determine what to make the digital readout to read on the TS-440S in order to find their frequency. In the case of the National Autostart Frequency, adding 2125 Hertz to the advertised Mark frequency of 14 085 625, provides 14 087 750 Hertz, which is the correct carrier frequency, and the correct frequency to dial in on your TS-440S to find the NAF.

With respect to the Kenwood TS-940S, when in the "FSK" mode, the digital readout always reads the "Space" fre-

MSO's Continued on page 22

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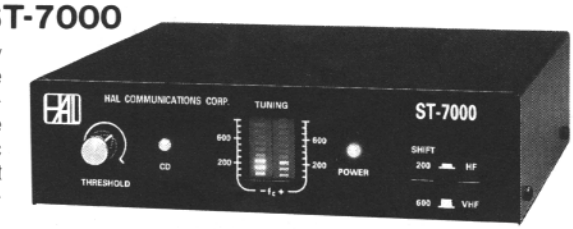

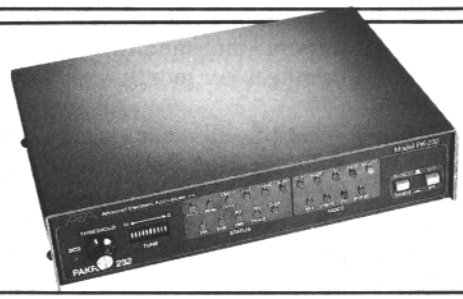

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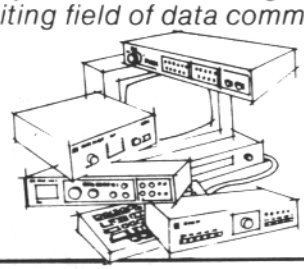

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quency. Again with respect to the National Autostart Frequency, the TS-940S digital readout will read 14 085 45 Hz when properly tuned to the NAF. If another MSO group advertises their frequency by describing where the Mark tone is, then you SUBTRACT 170 Hertz from that reading, in order to calculate the correct frequency to tune your TS-940S to. For example, the National Autostart Frequency is described as being on 14 085 625 Hertz Mark frequency. If you subtract 170 Hertz from that you end up with 14 085 455, which is the reading that must be on your TS-940S digital display, in order to properly receive the NAF.

Here's about the most simple way to determine what information your digital display is providing. Tune from 14 085 000 Hertz to 14 088 000 Hertz until you find one of the MSO's on the National Autostart Frequency. Place your receiver in either "FSK" or "Lower Sideband" mode, whichever you find the most useable. If your digital display reads 14 087 750 Hertz, then your digital display is outputting the carrier frequency. If it reads 14 085 625 Hertz, then it is outputting the Mark frequency, and if it reads 14 085 455 Hertz, then it is showing the Space frequency. Confusing, to say the least, but the lack of standardization between brand names and between models within brand names, causes this problem. A final reminder is that proper and routine calibration of your receiver and digital display is necessary to accurately find RTTY systems. Good hunting!

MSO RAMBLINGS

SYSOP Larry Workman, KA0JRQ, has returned to the National Autostart Frequency after a short absence. Good to see you back up and running Larry!

SYSOP Ernie Johnson, W6ZRR, San Luis Obispo, Ca, reports that his MSO will be off the air for a short spell, due to equipment repair problems. Ernie is making very good progress back to good health after two major surgeries in the past year. That sure is good news Ernie, and we'll look for your MSO back soon!

SAD NEWS DEPARTMENT

Our deepest sympathy goes to Jay and Joan Dyer, WB8ZTY, and their family, in the recent passing of their son Joel. Joel fought a valiant battle over the years with various health problems, but the Dyer family always found ways and means to enrich and preserve Joel's life. Even short as his stay was, his presence enriched the Dyer family life, for which they are forever thankful.

INFORMATION INPUT NEEDED

As always, in order to make the MSO Column as interesting and informative as possible, I need input from YOU! Please don't hesitate to drop me a line with any information relative to MSO's or RTTY, or to ask a question that I might be able to answer. The MSO Column is YOUR column and your input is needed!

That's it for this month Gang. Have a terrific Summer, and I hope to see you on the MSO's. **de Dick, K0VKH**

DON'T BE A BEACONITE!

MARS Continued from page 10

ion has been so successful that the Army has substantially altered it's operating rules to accommodate more use of various digital modes, and to encourage more experimentation. Several states are now handling traffic within their borders using RTTY and Packet message switches on HF and VHF bands. Even at the area level, the Central Area Director is experimenting with an MSO operating in the 10 MHz region.

The Army recently refurbished it's three state-side gateway stations, which are located at Fort Deitrich, Fort Sam Houston and Fort Lewis. Gone are the ugly old green and grey military radios, the old Model 15 and 30 teletypes, the tape distributor heads. Instead, you will find modern computers, commercial interface units, and Kenwood 940 radios - just like you would expect to find in a modern well equipped home Ham station.

The net result of all these changes is traffic around the country and overseas is actually moving faster. I recently got a call from a lady who wished to get a message to her son stationed with the Army in Germany. She said her experience with MARS indicated that it is now much faster than mail. Surface mail apparently takes a couple of weeks to reach her son; MARS takes, at worst, a couple of days. It also is cost- free to both the sender and recipient.

The affiliate membership is doing it's own experimentation and development, too. Mr. George Ellis, the State MARS Director for Oklahoma, has developed a computer program for IBM -compatible computers that takes the pain out of the record-keeping required for any station that handles formal message traffic. His system can sort traffic by its destination, serial number messages, log them, list traffic on hand, search by individual message elements ... all the tedious tasks that make some people turn their backs on handling messages. The program is specifically designed to meet all Army MARS requirements for formatting and logging messages, and is available at no charge to MARS members from Mr. Ellis. Mr. Ellis says the program was nearly a necessity at his station - he handles from 300 to 700 messages per month.

What this all means is a MARS system different from the system of ten or even five years ago - a system keeping pace with the times. Under solid leadership provided from the Chief on down, when existing rules got in the way of progress, the rules were rewritten to allow progress to continue. As a result, my state is seeing more applications for membership, and from younger people too. Our newest member is only 14 years old, and becoming a regular on our nets.

It is hard to tell what the future holds for the Army MARS system - but you can read about it here.

If you are interested in exploring the potential of Army MARS, contact your state Army MARS director. If you have difficulty locating him of her, contact me through this magazine.

de Joel, N0GHT

CLASSIFIED ADS DEPARTMENT

First 30 words $5.00, additional words 5 cents each. Cash with ad. Deadline for ads is 1st of month of publication. (Example - Ad arrives by 1st of Septmeber will be run in the september issue)

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BACK ISSUES -- A duplicate of any back issue of the RTTY Journal may be obtained from Red Wilson, WB0ESF 4011 Clearview Dr, Cedar Falls, IA 50613, $1.50 PPD & SASE. Reprints of both UART articles $2.00 PPD.

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