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ALL DIGITAL DXPEDITION TO AVES ISLAND "YV0AA"

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DIGITAL MODES ARE FUN! Get on the air today!

"Thank You"

Venezuelan Radio Club

This picture depicts the catamaran sailboat and crew used to reach Aves Island. In the distance can be seen the island and it's Marine Biology module. Story starting page 8.

RTTY JOURNAL

Dale S. Sinner, W6IWO
Owner, Publisher, Editor

ALL CORRESPONSENCE:
9085 La Casita Avenue
Fountain Valley, CA 92708

Phone: (714) 847-5058
FAX: (714) 892-2720

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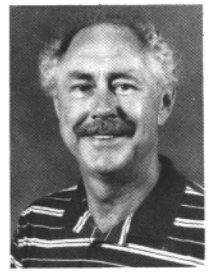


HITS & MISSES

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

MAIL

I have been publishing the RTTY Journal now for over 4 years and each month somehow it all comes together and we end up with the right number of pages. But sometimes it is a problem scratching to find enough information to keep the Journal interesting. Consequently, here I am pleading with you the readership again to pitch in. Somewhere out there many of you have ideas that are worthy of sharing with all of us. I would like to put them in print for you and as long as they are reasonable and cover subjects concerning the Digital modes they will be used.

In bringing up this subject again, I know I also speak for all the Journal Columnists. They sometimes run dry too! Try to put yourself in their shoes, writing a column each month that remains interesting. It is not an easy task but their endeavors could be made easier if only you would write to them. Tell what you like to read about or tell them what you would not like to read about. The main thing is to write and help them find the right topics to cover in their columns. As I mentioned last month, the Reader Survey has helped but there is still more room for suggestions.

How about all the new subscribers to the Journal, what would you like to read about? You are an important part of the Journal too! If I don't publish the articles you want to read then you don't renew. At the rate the Digital modes of our hobby are moving, we should be running a back log of material for publication but unfortunately, that is not the case at present. You can help to change that, so please write and share your thoughts, ideas, suggestions, fixes, mods, etc.

COVER CHANGE

I have made a slight change in the looks of the cover to keep pace with the movement of the Digital arena. This is not going to change the Journal into some different kind of publication. It is designed to make the Journal more appealing to those who operate the Digital modes but believe the Journal covers only RTTY. As an example if you have been listening on the bands lately, you probably noticed a great deal of AMTOR QSO's taking place. In fact there has been such a tremendous increase in this mode that I dare say it has overtaken RTTY at times. This is a credit to the manufacturers of Digital equipment who have made it all possible by including many modes of communication in their terminals (now called Controllers). It has always been my policy to publish articles on all these different modes and so I felt it was time to make this slight cover change. What do you think?

ARRL Committee on Amateur Radio Digital Communications

I was recently appointed to this Committee by ARRL President Larry Price. The committee asked me to help in relaying the thoughts of the Digital comunity, specifically RTTY, and AMTOR. However, I will also be representing those interests who were a part of the Special Committee formed last year which worked to have RM-7248 rescended.

In accepting this appointment, I hope to be able to better represent all our favorite phases of the Digital modes. This will be a heavy task and I will do my very best to represent you. To do this I ask for your support. Let me know what your feelings are about the Digital modes.

Since this is intirely new to me and I do not have any background obout the Committee, I ask your indolgence while I catch up. It is my understanding, the Committee meets but twice a year, so it does take some planning on the part of all members to be prepared for this type of schedule. Hopefully, I'm up to the task. I will keep you informed.

ABOUT THE COVER

I can't say enough about the Dxpedition we are featuring this month. The members of the Venezulelan Radio Club and in particular Pasquale, YV5KAJ, must be very proud of their acheivement. To put together an all Digital Dxpedition is highly unusual to say the least, particularly in light of the fact that special transportation had to be secured for this endeavor.

So, hats "OFF" for this special effort.

73 de **Dale, W6IWO** ■

MSO'S

Dick Uhrmacher, K0VKH
212 W. 48th St.
Rapid City, SD 57702

Hi Gang! Gee, can Summer be almost over already? Seems like the time flies these days. MSO activity has increased quite dramatically in the past 30 to 60 days, and the National Autostart Frequency has been busy. My XYL and I are off for two weeks of well deserved vacation up in northwest Montana, and I hope the fish are biting.

APLINK SOFTWARE NOW AVAILABLE

Vic Poor, W5SMM, announced on July 2, 1990, that Version 4.0, of his popular APLINK software was now available for delivery. This software is being distributed without cost by Paul Newland, AD7I, P.O. Box 205, Holmdel, NJ, 07733. In order to come as close to breaking even on this project as possible, Vic and Paul request that you send a formatted 5 1/4 inch floppy diskette, a return floppy mailer, and sufficient return postage, with your order for this software.

Version 4.0 of Vic's software is system specific. It is designed to work utilizing the PK-232, AMT-1 or HAL "PC- AMTOR" systems, and you must specify with which system you intend to use it , at the time of ordering. This software has been written to work through the computer bus with the HAL "PC-AMTOR" system (without use of the PCI-3000 "host port"). If you are thinking about firing up an AMTOR/PACKET automated system, this is the software to have. Vic has poured a lot of development and testing time into this sophisticated software, and you can see many of these systems now operating on the various bands.

WHAT'S HAPPENING WITH "UNATTENDED DIGITAL OPERATIONS?"

It sure has been quiet on this front since the Dayton HAMVENTION, and the ARRL's withdrawal of RM-7248. I'm not so sure that the Federal Communications Commission will indefinitely extend the Special Temporary Authorization for the HF packet guys, to operate unattended. Will the ARRL solicit user input to be used in formulating another request for rule making, including input from RTTY, AMTOR and CW users? I don't think that the packet guys are going to roll over and play dead, just because RM-7248 was overwhelmingly disapproved by all who knew anything about it.

I received a very nice letter from the St. Louis Amateur Teleprinters Society (SLATS!!) expressing some of their misgivings about unattended packet stations. They state that they felt that unattended computer based packet systems remove the "human" element, and that is not to their liking. They asked that our hobby not be allowed to have commercial traffic handling systems like HF Packet, where computer to computer contacts were the normal way of doing things. Thanks for your input guys, and let your ARRL Section Manager know of your feelings!

WEARIN' OF THE GREEN!

Gee, it's really too bad that the RTTY Journal isn't printed in color. The best part of the photo below is Clark Constant's (W9CD) bright green PGA Master's jacket! He's the handsome devil in the middle. Well known to the world as the author of the popular computer based "MSO Program," he seems to be saying....."You need another copy of my MSO program???"

Flanking him on his right is Frank Moore, WA1URA, who read to folks attending the RTTY Dinner (held during the Dayton HAMVENTION weekend) a wonderful letter from Jerry Trichter's (WA1IUF) daughter Robin. I don't presently have any updated information about Jerry, but I hope to hear more in the near future.

And, on Clark's left is the Imperious Leader, Grand Dragon, and High Potentate of the Oh-Wha-Tah Society, none other than Bob Foster, WA7QWG. It is through Bob's expertise and fellowship that we enjoyed another outstanding RTTY Dinner. As sponsor, moderator, chief cook and bottle washer, Bob again provided us with an evening of entertainment hard to forget. And not only that, but his selection of cuisine for the buffet was outstanding. I can't wait until next year!

NATIONAL AUTOSTART FREQUENCY GROWS

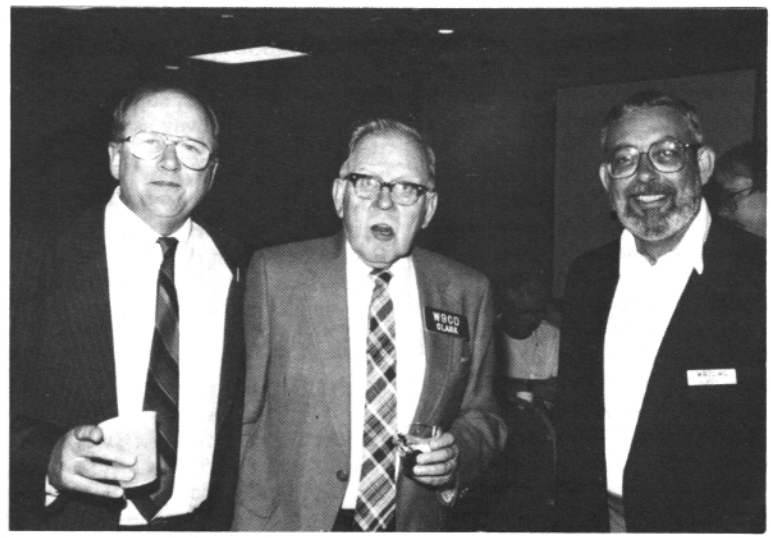
Two new MSO's are now available for use on the National Autostart Frequency, (Mark frequency is 14.085 625 Hz), and I'd like to take this opportunity to welcome both of them.

Jay Roman, KB0ATQ, of Rapid City, SD, started operations about six weeks ago. He presently uses the HAL MPT3100 MSO system, an ICOM IC-725, and a KLM-34XA beam at about 60 feet. Being that Jay and I can tie our antennas to the same telephone pole, I can guarantee you that he has a whopping signal! If you scout around on 10 meters, you'll probably also run into Jay's son John, (KB0FTH), who also enjoys the RTTY mode. Jay intends to place a second MSO on ten meters in the near future.

John Chiuchiolo (W2LWB) of Brooklyn, NY, also has his system up and running on the National Autostart Frequency. I presently do not have all of the specifics on John's equipment, but I do know that he's running a Kenwood TS-940S, and the popular W9CD MSO software. John's signal is very good here in the western South Dakota area, and I'm sure his MSO will be a popular one.

That's it for this month Gang. I hope you all are enjoying the Summer activities, and getting in a little RTTY to boot. See you on the MSO's! --73--

de **Dick, K0VKH** ■



L. to R. Frank, WA1URA/7, Clark, W9CD, Bob, WA7QWG. RTTY Dinner. Dayton 1990

CONNECTIONS

Cole Ellsworth, W6OXP
10461 Dewey St.
Garden Grove, CA 92640

Hi everyone. Hope you had a nice Summer. We did, but it was too dry and hot to suit me. California has drought conditions, but I guess I should not complain. TV news shows severe flooding in some states. Hope your gear did not get wet.

MACINTOSH SOFTWARE

ZCo Corporation, P.O. Box 3720, Nashua, NH 03061, (603) 888-7200 claims to have the largest collection of commercial (non PD) ham radio software in the world for the MACINTOSH. They say they have programs for Packet, RTTY, FAX, satellite, Morse, theory training, gray-line, MUF maps, logging, contest, cw keyer, etc. You readers who have written looking for Macintosh programs, here is your chance!

Being non PD (non-Public Domain) programs, these will cost you $$ but they might (I say might) have better support.

NEWCOMER'S CORNER

DICTIONARIES AND GLOSSARIES

Numerous readers have written regarding digital radio and computer terms and what they mean. I believe that most of our columnists try to explain new terms but because the hobby is so technical and changes so much, it is not an easy task. Book stores and sometimes radio stores have dictionaries of electrical and electronic terms and they may also have computer term dictionaries. I would strongly recommend that the newcomer to digital radio drop by the bookstore and glance through these books. It might be worth your while to purchase one or two, especially if you can find them in softcover editions. Meanwhile, I will attempt to explain all "new" and/or uncommon terms, acronyms, and abbreviations as I use them.

FSK and AFSK - A Tutorial

FSK (Frequency Shift Keying) means to shift the transmit carrier frequency back and forth between defined limits at a rate determined by the digital mode in use. This is normally the method of keying used on HF bands. The defined limits of shift for RTTY and AMTOR is usually 170 Hz of carrier frequency shift, where the idle (no data being transmitted) frequency is called the MARK frequency and the SPACE frequency is 170 Hz lower. It is the timing of the back & forth shift of the carrier frequency between MARK and SPACE that determines the information being transmitted. The carrier shift is acomplished by applying the keying voltage to one the transmit oscillators. Usually it is a carrier oscillator that is shifted rather than the VFO.

AFSK (Audio Frequency Shift Keying) means to modulate a transmitter carrier with an audio tone that shifts back and forth between two given frequencies. Again, as in FSK, the limits of the audio tone shift is normally 170 Hz for RTTY on HF bands, and can be 170 Hz or 850 Hz on VHF bands. The important difference from FSK is that the carrier frequency is not shifted or, at least not directly. On VHF the tones are normally applied to the mike input of the FM transceiver. Thus, the transmitted signal is an FM modulated signal. Now on HF bands, if we use AFSK, the tones must be applied to a SSB transceiver audio input. The tones modulate the carrier and creates sidebands. However, the SSB transmit filters attenuate the upper side band and carrier to at least 40 dB (we hope), so that the output spectrum appears to look like the output from a FSK transmitter. While this works quite well in most situations, good engineering practice demands good filtering of the unwanted sideband and carrier. The most serious problem with AFSK driving SSB transmitters is proper setting of the audio input level to prevent overdriving the SSB circuits and causing splatter all over the band. Another problem with AFSK and SSB, is that some SSB transceivers are not designed for long periods of continuous signal operation or duty cycle. SSB in normal voice use is only fifty percent duty cycle, at most. This does not load the transceiver power supply and transmit devices nearly as heavily as does RTTY operation. So if you have a 100 watt output transceiver on SSB, then you should run only 50 watts output on AFSK RTTY, unless you know the transceiver is rated for 100 watt continuous key-down operation. In all fairness, I should mention that the above power limitation also applies to SSB transceivers using FSK RTTY.

WE HAVE MAIL

Gyorgy Osvath, HA5CP (Gyuri) in Budapest, has a Yaesu FT 757 GX that he would like to convert to FSK mode. Before he digs into the radio's inner workings, he would like to hear from anyone, anywhere, who has modified the FT757 for FSK. Please write to Gyuri or to me if you can help. OSVATH GYORGY, BUDAPEST 1142, CSAKTORNYA PARK 4. 11.15. HUNGARY. It seems the FT-757GX has SSB, CW, AM, and optional FM modes, but not a FSK mode. Therefore you have two choices: run AFSK in the LSB mode or run the rig in CW mode and find a way to FSK one of the oscillators for direct FSK. Gyuri wants to modify his rig for direct FSK. If the rig has a narrow CW filter, then the direct FSK is the best way to go. Something else that may cause a problem in FSK is that I do not see a RIT/XIT control on this rig, so there may be a problem of keeping the rx frequency and the xmit frequency exactly the same. One has to look at the circuit diagram and the oscillators involved and do some calculations to arrive at the actual relationship between xmit and rx frequencies.

MORE INFO ON TONO

The mail brought a card from Dean, WA6PJR, who says he is informed by Gin JA1ACB, that the Tono Corporation no longer makes any Ham RTTY gear. Gin is having great difficulties scaring up used ones for expeditions. Dean says Drake also marketed these integrated RTTY boxes at one time. How sad that these units were to become unprofitable with the advent of computer-driven equipment. Thank you, Dean, for passing along this information. Anyone desiring to promote rare RTTY DX could do worse than making their no longer used, Tono/Theta all-in-one RTTY box available.

Speaking of Tono, I noticed that the latest QST classified (Sept., 1990 page 172) had an ad for an IBM computer program "TCOM-777". This appears to be a terminal program for the Tono Theta-777. If you have a Theta-777 and are interested, write R. Lewis, PO Box 522, Garrisonville, VA 22463. I am passing this along as information only.

MORE MAIL

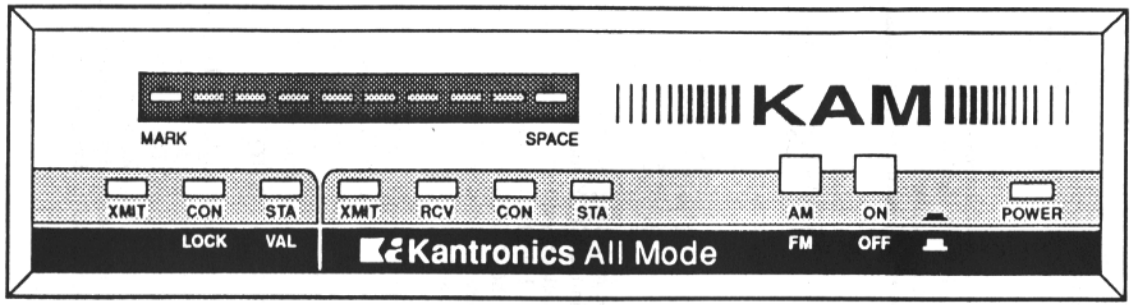
Jim Humphrey, RT 5, Box 207, Eau Clair, WI 54703 has a Teletype Corp. Model 40 CRT terminal/Keyboard, but has no data or manuals on the machine. This machine is an ASCII terminal, as I recall, so should be compatible with TNCs, Multi-mode Controllers, etc. Jim is looking for someone who has a similar unit in use to help him get started. Or I imagine he would be very appreciative to receive any information or manuals on the unit. He wants to use the terminal for RTTY and AMTOR. Can anyone out there help him?

SOFTWARE UPDATES

Kantronics announced the release of firmware update 3.0 for the KAM, KPC-2,KPC-4,KPC-2400, and KPC-1. The firmware upgrade includes several major features:

1. Reverse forwarding of personal mailbox messages.

2. The addition of a software carrier detect



KAM
Kantronics All Mode

Packet/RTTY/ASCII/AMTOR/NAVTEX/CW/PBBS/Host/Gateway/KA-NODE/Wefax/KISS

- **Packet** – 2 radio ports: simultaneous VHF and HF Packet. When doing other modes on HF, PBBS, KA-NODE, and digipeater are still available on VHF
- **RTTY/ASCII** – MYAUTOST command allows MARS calls for unattended RTTY/ASCII operation
- **AMTOR** – Preprogrammed 170, 425, and 850 Hz shifts, plus user definable shift (mark and space tones). AMTOR 625 provides for 7 character or 9 digit selcals, relinking, and compatibility with 4 character operation (476)
- **NAVTEX / AMTEX** – Using NAVTEX mode you can copy the ARRL bulletins of your choice, using the AMTEX format.
- **CW** – Selectable CW bandwidth and center frequency
- **Personal Packet Mailbox (PBBS)** features: programmable size, reverse forwarding, capability of rerouting connects to PBBS, optional Battery Backup will store messages when unit is turned off, optional SmartWatch will store messages, and keep date and time when unit is turned off.
- **Host Mode** – Allows special terminal programs access to all TNC features in the packet mode.
- **Gateway** – Unique MYGATE callsign allows packets received on one port to be digipeated onto the other port.
- **KA-NODE** – Provides a relay station that handles acknowledgments between it and an end user, or another node.
- **KISS Mode** – for TCP/IP
- **Weather Facsimile (WEFAX)** Reception (optional special computer program needed.)
- **Software Carrier Detect**, when selected, will only detect carrier when packet signals are present allowing you to run open squelch and detect weaker signals.
- **Full duplex** capability
- Compatible with any computer having an asynchronous serial I/O port using standard ASCII, RS-232 or TTL voltage levels jumper selectable (can be used with RS-422). Computer must be running a terminal program.
- AC/DC transformer, cables, and connectors for unit included
- Bar graph tuning indicator
- 12 pole switched capacitance filter
- 32K RAM
- Indexed manual set, pre-punched for 3-ring binder – allows easy updates
- Reliable, fast acting AGC eliminates the need for a manual threshhold adjustment
- Size: 1-3/4" x 6" x 9", 2-1/2 lbs.
- Requires 12 VDC at < 300 ma
- Made in U.S.A.

Kantronics – RF Data Communications Specialists

1202 E. 23rd St., Lawrence, KS 66046, 913.842.7745, FAX 913.842.2021, BBS 913.842.4678

feature.

3. The addition of several new modes of operation: Host Mode, AMTOR-625 (KAM only, and NAVTEX/AMTEX (KAM only).

4. The addition of several new commands such as RESTORE and RESTORE D, allowing flexible use of command parameters.

For more information, call or write the factory for a detailed specification sheet. Kantronics, Inc., 1202 E 23rd St., Lawrence, KS 66046, (913) 842-7745, FAX 913-842-2021, landline BBS 913-842-4678.

REPRINTS AVAILABLE

Dale now has a booklet containing much of my discourse on RS-232, Computer parallel and serial ports, and the peculiarities of COM 1 and COM 2 for a reasonable fee. If you have missed the columns in the Journal on these subjects, starting about 3 years ago, then this booklet will cost less than ordering all the associated back issues. I would like to add that Dale also has a Journal index for the past 5 or 6 years that should help you to determine if a back issue has covered a problem that you might have. Details

PACKET

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

SARTG

Basically put, and rather bluntly, the band conditions wreaked. I get better propagation shouting across a dung heap, while downwind of it. Needless to say, the bands were dead. So, I guess the collective ego's of me and Danny, N6IHQ, were deflated. Here we had put up the beam and got it working and used my radio for the contest and had three computers running, one for communicating, one for logging, and the third for propagation and beam headings with the third one not being needed because there was no propagation.

I will say this, despite the trifle number of stations that we worked, Murphy did hit us in the form of Danny's son Dennis and his feet. Dennis managed to trip over a cord and knock the logging computer off line. Courtesy of that, I found a rather big bug in the logging system. Whenever the logging program was to write an update to the disk file, I thought that it was supposed to go directly to the disk file. Well, it wasn't. It was evidently going to a buffer of some kind and was going to be written to the disk file when the buffer was full. So, when the computer dumped, the file was still in the buffer. So, I modified the program immediately to close the file after an update to cause the system to write the information to the disk file. This does not dig into the timing of the program because, as soon as it is closed, it is opened up again. That fixed the bugs.

This past weekend, one week after the contest, we ran the station again and we enjoyed great contacts. We were getting into DX pileups with the best of them. There was a Colombian station on and he would have been a good one to snag but he was answering the last call in the pileup. Oh well! I managed to snag a Brazilian station who was coming in at +15 over. After him, I had a ragchew with a Ham in Austin, TX for about 30 minutes. He wants to get into packet and the digital modes. Another one for us. Yea! So, we will be ready for the CQ/RTTY Journal RTTY contest at the end of September. Time to update the software for the exchange.

By the way, the CQ/RTTY Journal contest is open to all digital modes, and that includes packet. So, get in there. The rules are in the July/Aug issue of RTTY Journal for your perusal.

BBS'S AND FORWARDING

My sympathies go out to the packet BBS operators in this country. Their boxes are constantly inundated with the ham equivalent of "junk mail" all of the time. As an example, and I will not use the real names involved here, person A wrote a scathing rebuttal to a review that person B wrote and it almost ended up being a character assasination on person B. Now persons C, D, and E jump on the wagon against person A and what he did. I do not see this on RTTY MSO's or AMTOR MSO's, just on packet BBS's. What a waste of air time and storage on the BBS's with such nonsense. I guess packet has attracted a bunch of "children" who do not believe in courtesy and caring for other's equipment. It does not surprise me one bit.

If you want to read something that is quite good and straight to the point and shows how STUPID the current BBS forwarding system really is, read Bill Snyder's, W0LHS, article in the current issue of "Worldradio." He talked about the current system and it explains how stupid it is laid out. The funny thing is that the BBS software pointed this out. Good going there Bill. I enjoyed reading the article.

It looks likes a hodgepodge at best. There is no thought to how the forwarding system is laid out and how BBS's are positioned at all. I have a feeling that the packet sysop's are going to have to sit down and figure out the forwarding mess and fix it themselves. I can propose one solution using network theory, but then you run into the "not invented here" syndrome. Also, when they do the revamp, get rid of the "ALLUS" forwarding designator and clean up the airwaves of "junk mail."

UPDATES

I received a FAX (via the Journal) from Kantronics and I thought that I would let you in on it. On August 20th, they released the 3.0 update PROMS for the KAM, KPC-2, KPC-4, KPC-2400, and the KPC-1. They now support reverse forwarding of personal BBS messages, software carrier detect, a binary "host mode." and a few others that are machine specific, like AMTOR-625 and NAVTEX/AMTEX for the KAM.

They also announced the release of their line of 9600 baud equipment. And probably the best arrangement of the available equipment is their 9600 Station combo. The Station comb consists of the Kantronics Data Engine, the plug-in DE1200 and DE9600 modules, which provide 1220 baud and 9600 baud operation, respectively, and a Kantronics DVR2-2 tranceiver. The 9600 Station combo retails for $695.00.

With that setup, you can operate as a gateway between a 1200 baud packet frequency and a 9600 baud packet frequency.

Also, I will be reviewing the above mentioned system here in the RTTY Journal. The review will be quite detailed and will cover all aspects of the system. I want to thank Kantronics now for the use of the equipment for the review and hopefully, there wii be more of their products reviewed here soon.

If a manufacturer wants me to review their product or products in the RTTY Journal, either contact me or Dale Sinner, W6IWO, and we can set something up.

WHO'S JAMMING WHO

Tidbit first and food for thought: What is going to happen to the retry rate for packet on HF when the sunspots drop off? Die like CB radio? Think about it. Also, there are some wags out there saying that the sunspot peak has gone by us and we are now heading down the other side.

Here is a question for you to think about.... What would be the outcome of a situation such as this? An RTTY station keys up on 14.095 MHz mark and asks if the freq is busy. Hearing no replies, he starts sending CQ (Hopefully no RYRYRY's, which triggers a LID-ALERT.) After he keys up, one of the unattended packet stations on 14.097 MHz carrier, working LSB, keys up. This then trashes the two transmissions. Well, of course, the packet transmission is no good because more than one bit of information is corrupted while the RTTY signal just has a few hits in a small area. Now comes the ziggy...Who is the jamming station? My answer to this next month.

BEGINNER'S CORNER

Last month, I included a chart on how to do basic connects to a station either directly or indirectly. This month, I want to start covering some of the settings in the TNC that you should be thinking about.

The first one that I want to cover is called TXDELAY. All this one does is tell your TNC to send "throw-out" characters for the indicated amount of time when the unit keys up. What this allows for is the amount of time that it takes for your radio to key up and settle on the TX frequency and the amount of time that it takes for the destination station's squelch to open up. As an example, a radio takes 35 milliseconds to stabilize on the transmit frequency and the destination station takes 15 milliseconds to unsquelch after hearing a signal on the channel. That adds up to 50 milliseconds right there and you should pad the value by a small amount, say 5 milliseconds, so now the total value is 55 milliseconds and that is the value that should be put in for TXDELAY. Remember, there are some radios that key up fast and there are some that are real dogs at keyup time, as well as ones that are unsquelched and some that take a long time to unsquelch. The setting has to be for the worst combination with which you will be dealing. If you set the value to a larger value than needed, you will slow down your throughput, the channel's throughput, and make people mad at you.

The next thing I want to cover this month is FRACK. This is the amount of time that your TNC waits before sending an acknowedgement back to the sending station. This value is usually set to 3 seconds and in some circles of thought, 5 seconds. This is one that is usually best left at the factory setting for most users of the TNCs. This value needs to be increased only if you are working through digipeaters (yuck) but if you are working through nodes, the value does not need to be changed.

KAM

Last month, James Sladek, WB4UBD, presented a modification for the Kantronics KAM filtering system. I thought that I would cover a point that may make things a little ticklish when it comes to the MF10 or MF5 filter chips. It has to deal with a bugaboo called offset. This offset becomes more critical as the filter Q is increased. In order to make the filter work best, you have to play with a resistor that controls the amount of offset. What happens is that if you design the filter to work at frequency F at a certain Q, you will find that the output of the filter will peak off to the side of the designed center frequency. By adjusting the offset resistor, you can make the peak occur at the design frequency. The resistor of concern is mentioned in the documentation for the chip.

For the low Q's that are involved with the KAM filters, the offset should not play that much of a role. But if you deal in high Q's, like 500(!) or 700(!!), then the offset resistor plays a big part. As an example, I have an RDF unit that uses an MF5 chip, set for a Q of 700. The adjustment of the offset resistor meant an output boost of 4.5 db. So, it can make a difference.

NEXT MONTH

We will cover some more in the Beginner's Corner of the timings involved with packet. Hopefully, I can start the first installment of the Kantronics 9600 station combo. If the system lives up to the advertising, and I'm sure it will, then this will be a fun unit to review.

Parting thought for RTTY'ers. Operate between 14.090 Mhz and 14.100 Mhz. You won't bother the packet stations. The packet stations TNC's are too stupid to recognize RTTY anyway. You will see me there when I am working N6IHQ/N6NKO. I still believe that packet belongs above xx.100 Mhz.

Peace can exist..... de **Richard, N6NKO** at the Owl's Nest ■

CONTESTING PHENONMENON

byline: **Hal Blegen, WA7EGA**

A strange phenomenon of contesting is the attitude changes. The pre-contest planning is filled with enthusiasm and optimism. Day one at Zero-zero GMT is colored with nervous anticipation. The frenzied activity for the first few hours of the contest brings an all-too-brief period of euphoric excitement. As the QSO numbers indicate that you're losing ground to the leaders, a sort of quiet desperation sets in. At 4 am on day two, just dragging yourself out of bed requires a state of committed determination. The last few hours are a study in momentum-driven apathy. Although an on- the-air post mortem with fellow contestants gives you a sense of camaraderie and accomplishment, sending in your log is sometimes an act of humility. Finally, months later, newly-delivered certificate in hand, comes pride in a job well done.

CONTEST SEASON is upon us and sun cycle 22 is showing a double peak similar to cycle 21 with the promise of one more shot at bands that, after this fall, may not open to some areas of the world for another 10 years. For digital operators, the gem of the season is the CQWW RTTY contest.

We have new classifications, this year. The SINGLE-OP ASSISTED category addresses all the missed DX that an honest single operator in previous years only found out about after the fact. The use of packet spotting nets will certainly improve the odds of working new countries.

The addition of a 10-minute rule for MULTI-SINGLE may put to rest some of the questions about two-transmitter, electronic switching but remember that the restriction does NOT apply to a multipliers. This makes it is absolutely essential for any multi- single effort to maintain an up-to-the-minute list of multipliers on each band. If you violate the 10 minute rule for anything other than a multiplier, you will have just joined the new MULTI-MULTI class.

Keeping track of multiplies is no easy task. Many QSOs count double multipliers and the first US or Canadian station worked on each band will probably be a triple (ZONE, STATE and COUNTRY). Working your neighbor on all five bands is 15 multipliers!

The big multi stations have not been active to a full extent in the RTTY contests (W3LPL has been running single op only with Ed, W3EKT at the helm). The MULTI-MULTI class may change this but I don't look for a lot of competition in this category, at least this year. This is a chance to run what used to be a multi-single using extra transmitters which should make for faster action and a more exciting operation. Group operations are always more fun and less fatiguing than single op efforts.

The thirty-hour limitation for singles can be tricky. Running later on Friday and taking added rest time on Saturday night will maximize the QSO rate and multipliers. Asia and the South Pacific are a day ahead which makes Friday night a better chance for those multipliers. Don't be over-anxious on Saturday or Sunday morning and jump on the earliest band opening. Giving it an extra hour to allow signals to build will allow you to make up for lost time with the faster rates in better conditions.

Working the packet clusters should keep you from missing rare multipliers. In terms of multiplier advantage, there is very little difference, now, between multi's and an assisted single. The whole area of what constitutes spotting assistance is not closely defined. You can use as many stations and operators as you want to support you with spotting, multiplier tracking. WS7IWA7EGA --"TG9VT going to 3595 NOW!" Operating independently, they can even try to move DX to your trap if they want, all within the framework of a spotting net. With no ten minute rule for single operators, you shouldn't miss much. There are more than 1800 possible multipliers! Check TG9VT's DX column for some eye-opening possibilities. No matter which category you select, this year's CQWW will mean fast action and probably the best DX you are likely to see for years to come. Don't miss it!

de **Hal, WA7EGA** ■

AVES ISLAND DXPEDITION 1990

Venezulelan Radio Club

byline:
Pasquale Casale, YV5KAJ

Ed: *Not many Dxpeditions go out as all Digital, as this one did. Therefore the RTTY JOURNAL salutes the Venezulelan Radio Club on this outstanding effort . It is a pleasure to feature this exciting story. Since it is quite long, the story will be presented in two parts.*

In this historic note, I would like to express how the Expedition to Aves Island was achieved in digital mode. I regret very much that on, the last expedition to the Island in 1987, this mode was not included. At that opportunity, the RTTY radio amateurs of the world asked me: "why wasn't there an RTTY operation?" There was no answer to the endless questions they asked.

Some time later, I found the reason, and all was because, for some of them, the system was too slow to be taken on an expedition of that type. This is what some of them said:

This was when I started worrying. On July 1988, an expedition to "Isla de los Monjes" (YY5M) was taking place and valid for IOTA.

I proposed to the organization to which I belong, that it was necessary to try an expedition with the three modes, and this became a reality, because for the first time, we were able to prove that a digital mode could be included in expeditions; but a small radical and traditionalist group maintained that RTTY was obsolete and slow, including, when we got back from "Isla de los Monjes," they called the system "The Infernal Machine" but this did not affect me, as the expedition was a success.

That same year, I unofficially proposed to the Venezuelan Radio Club (RVC0 to make an expedition to Isla Aves. It was agreed to consider the possibility of how it could it be done and they assigned me to organize it. While this was being planned in February '89, again another expedition to "Isla de los Roques" (WYSLR), took place and, to my surprise, I was invited as the RTTY operator.

On July of that same year, the Venezuelan Navy was celebrating its anniversary, and, in view of the success that Los Monjes had, it was proposed that the RVC activate another island. At this opportunity we chose Isla de la Blanquilla (YV5LB). The organization, together with the Navy, elected me as general coordinator of the expedition. Therefore my favorite mode, RTTY, could not be missing. The results of this expedition were fantastic from all points of view.

Coming back from Blanquilla, I was even more motivated to make an expedition to Aves Island. Being the QSL Manager of the VRC, in August 1989 I proposed, as a director, an expedition to Aves Island between the months of March and May of 1990, as I had already obtained several things for that expedition, the first being that I had met with an old friend from childhood who could take us to the Island on a Catamaran.

The Board of Directors saw this as an adventure, very original, and with a great enthusiasm, my colleagues of the Board and Pedro Jose Fajardo (YV5EC), President, accepted and I was officially authorized to plan the expedition to Isla Aves in "Only Digital Modes."

How did the Catamaran appear as a true reality? One day God sent someone anxious to do something useful for the world of Ham Radio in RTTY and I met with my friend, Victor Mercader, who told me that he was interested in becoming a radio amateur, since he had always thought of this and since most of the time he is sailing through the Venezuelan Islands and wanted to communicate through Ham Radio, considering that they are always the best help in any emergency or QTC.

It was then that I asked him about his sailboat "Realidad," and he told me that he had sold it and that they were building him a Catamaran and it would soon be launched. He explained to me that his new sailboat was safer, and sinkable, since it is made out of fiber and, due to it's particular design, it makes it a rigid and stable sailboat.

While I started to tell him of my experiences, which I had in the different Venezuelan Island, which my friend Victor knew, I also asked him if he ever had been to Aves Island. His reply was that it was his greatest wish to sail there, since it is the farthest and most important because of the type of navigation, since, to go there, you have to be professional. Therefore, I proposed to him if he would take us, I would get the landing permit. He agreed with this, warning me that it would be a very difficult experience to go to the Island by sailboat, but my colleagues and I decided that it was our only goal to put the RTTY signal on the air. This is how we found the transportation to go there.

All this started to become reality when the VRC sent an application to the Commander-in-Chief of the Army, and some days later we had a conversation with Vice Admiral, Hector Jurado Toro, who, after reading the application, agreed with our expedition, because of the way were planning it and that, for the first time, the group was not going to be taken by the Navy, which was very important. Because of the economical situation of the County, it would have been difficult for the Army to take a group of Radio Hams and wait for them for several days, since it costs a lot of money and that is why they approved the application.

As you know, the Venezuelan Army is the one who maintains and looks after the Island, since it is one of the most important scientific basins of the world, because of its birds, sea turtles and a lot of sea species that live there. It is a natural source of high potential sea animals that the conservationalists consider of great importance. After our talks with the Commander, he told us that he would help us in any way possible.

As the days went by, we received the permit to go and the second step was to send the request for the Amateur Radio Operation from Aves Island to the Minister of Transportation and Communications. We also took the opportunity to request a formal interview with the Director of Communications, Engineer Julio C. Alvarez.

The day that he interviewed us, he already knew of the YV0AA application. He approved the expedition and, without any problem, he gave us the permit.

I want to point out that, during the time when we were waiting for the permit, the VRC was in its election process for their new Board. That is why the permission had the names of the ex-president, Pedro Jose Fajardo and Xiomara Davila, the name of the new President. Once we had the permits in hand, we published officially through the national and international media: "THE FIRST DIGITAL EXPEDITION TO AVES ISLAND 90."

But our big surprised was that in two different bulletins, QRZ DX and the Long Island DX bulletin, announced an expedition of another group of radio amateurs of our Country.

But not just that. On 16.2.90, ARRL DX 7 announced an expedition to YV0 with TG9VT and OH2BH participating. This news shocked us and we went again to the Commander's office and to the Ministry of Transportation and Communications, who guaranteed us that they had not authorized any other permit but ours. With this assurance we were reassured and we continued with our preparations for the trip.

We informed all the world that between April 11 and 15, 1990 YV0AA would be on the air. On March 23rd, the Army, offered to transport

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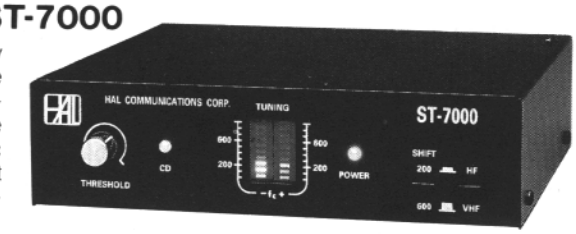

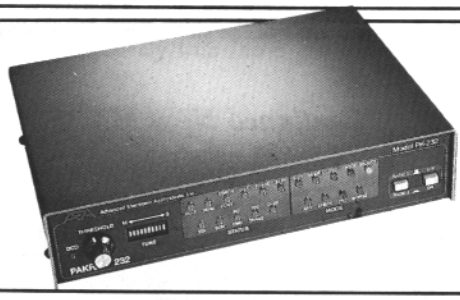

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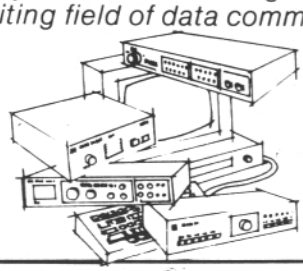

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all the equipment that we were going to use on the Island, since one of their fleet had to go there and relieve personnel and to take food.

This would help us a lot, since it would take much of the weight off the sailboat, we could take more equipment and it was going to be taken back the same way.

The following are the operators that went to the island: YV5HKD Elias Cofino, YV5IZE Domingo Hernandez, YV5LMG Luis Marquez the ship's captain (my friend) Victor Mercader YV5MVP (who by this time was already a radio amateur) and me YV5KAJ or 4M5RY (as I am known in the world of the RTTY).

Everything is ready for departure (6/4/90) from Puerto La Cruz to Pampatar, Margarita Island, This first leg was going to be our first training on the sailboat. We departed at 04:00 hours local time and go to Pampatar on the 7th at 09:00 hours YV. This first leg of the trip was a real odyssey.We even lost count of the times the sail went to the opposite side, but accepted it with pleasure: our adventure.

We arrivesd at Pampatar where we rested and got together with the Radio Amateurs of the Island. The Regional House of VRC (Porlamar) threw us a party that night, which was very important to us.

On our way to Pampatar, our VHF Marine gear was damaged and our thanks to YV7YM, Cesar Avellaneda, who lent us a IC-28H ICOM with general coverage

With a great optimism, on April 8th we departed to Aves Island, The captain gave an estimated time of arrival after 50 hours of sailing, if the winds were in our favor. We departed at 06:00 YV time. Our last sight of land was at 10:45 YV which were little islands "Los Frailes" and, from then on, we could only see sea and sky and every now and then there was a seagull or another type of sea bird.

The wind was not always in our favor. We were sure that we had to tack, each time we took a position, each hour we noticed that we were knocked about. We could not do anything and, when were close to the Island, we could do the first proper navigation, the waves were always on starboard.

The next day, after almost 30 hours of sailing, we had our major disappointment: "The Satellite Navigator" got damaged. This was a very vital instrument for us to get to the Island.

Being well aware of this problem, we decided to continue, since at night it could be possible to sight the island. We were awake all night and all my friends were on deck to celebrate in case we could see the Island's lighthouse during the night. We saw a light but not a very constant one and were confused. We had HF communication with the Island but not on VHF, which made us believe we were still quite far from the Island.

As the night went on, we had a bit of bad weather. At times the waves covered the boat, thanks to God we did not have any major problems. At daybreak we were still without finding the Island. That morning the sea was very rough. We could not see any ships near by and were tired from not having rested all night and not having an exact position of where we were.

Before daylight the captain used the sextant but due to the bad weather, he could not take his measurements correctly, also because of the movement of the boat. Because of this situation we all had a meeting with the captain at 11:00 YV hours and, since all was getting complicated and not finding the island, we decided to head back regretting above all our Radio Operation.

The captain, being well aware of the situation, agreed with us to turn due-south but deviated a bit to the east, as, according to his navigation instinct, the island was below us at about 4O° to the east and because of his estimation we might see it. The idea was to sail until 14:00 hours YV in that direction, we all agreed.

Our friend, Domingo, said that we were near the island because of the kind of waves we were having at that moment; he had once read about it, it is a typical characteristic of the sea around the Island. At about 13:00 YV hours we heard on the VHF emergency channel (Channel 16) a ship who identified as AMUAI MAR calling the island but without getting a reply.

Domingo called them to see if they heard us. The AMUAI MAR replied and we identified and explained to him that we were heading to Aves Island and told them about our problems and they told us that they too, were heading to Aves Island.

At this moment we were all happy, since there was a hope that we could get to the Island. Victor, our captain, gave an estimate of our position to "Jorge," the other Ship's Captain, in this way we found out that we were at just 3 miles from them and 16 miles from the Island.

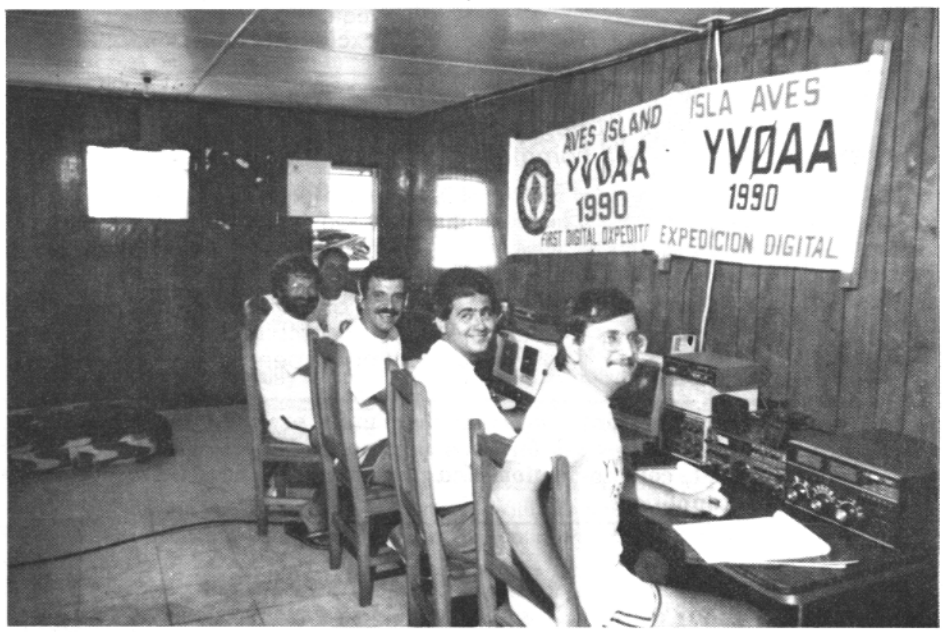
Using our portable equipment, we could confirm that we were near the other ship (which was a fishing boat of the area) since he was copying us with low power.

"Jorge" requested our position by the nearest cloud we could see. Between the clouds appeared one shaped like "sleigh" and, by this cloud, we were able to confirm and have an exact position and, minutes later, Captain "Jorge" informed us that he had already seen us.But 30 minutes went by before we got to see them.

After this sighting, AMAUAI MAR, the fishing boat, approached us. We waited the appearance of a new satellite. The fishing boat had its satellite navigator. Having this information, we were at barely 11 miles from Aves Island.

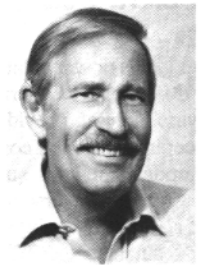
Victor, our captain, now having the exact position and being so close, decided to start the little motor and in five hours we got to Aves Island where we celebrated with champagne that we had on board, with the people of the Island and the crew of the ship who helped us to achieve our goal.

Continued Ne xt Month.



AVES ISLAND operators. Front to Rear. Domingo, YV5IZE, Pasquale, YV5KAJ, Luis, YV5LMG, Victor, YV5MVP, Elias, YV5NKD.

DX NEWS



John Troost, TG9VT
444 Brickell Ave, Suite 51-265
Miami, FL 33131-2492

The propagation in August has been nothing to brag about. Although the Flux reached the highest level in years, in the 300's, the A-Index was such that DX was hardly possible. As of this writing, early September, the A-Index and the flux are dropping and good Dx is again possible, even on 10 Meters, where I have not seen but a little RTTY this year. Are better things in store for us? The ARRL Propagation Forecast seems to think so.

Will the CQ WW RTTY Contest once again be with the same wonderful conditions as last year? There will be plenty of DX, so some good propagation will make it fun for all of us. I plan to take part again, after all have to defend my title, and will try and spend a bit of time on 40 and 80, though 80 has not been the greatest thing in the world. Anyway, we'll be looking for the U.S. and Europe about 0500Z on 7,038 and at 0530z on 3,685. Come visit me, I will try to be noisy enough.

Also plan on the same frequencies at 1100Z and 1120Z respectively with Japan and the Pacific.

RTTY BAND SEGMENT

It seems, that in spite of our VICTORY with the withdrawal of the ARRL Petition to allocate the upper portion of our RTTY bands to PACKET Bulletin Boards, our victory has not done us much good. PACKET STATIONS, permanently linked, have taken over the upper portion of each of the 10 through 20 Meters and trying for a QSO in the 14,092 to 14,000 is a practical impossibility.

Now what are we RTTYers going to do about this? Some of the culprits, and by far not all of them, were listed in the previous issue of the Journal. And you would think that these are LIDs, but most of them are skillful and well-known amateurs.

Any thoughtful suggestions to regain our spectrum would be highly appreciated.A well known DXer from Australia wrote me this:

PACKET RACKET-WHY?
Where has the Gentlemen's agreement of Amateur radio gone? I well remember there was a gentlemen's agreement between CW and phone, which we kept happily: Then along came SSB. Sure there was some discussion, but again we reached an agreement and all was well. Then there came RTTY, again we reached an agreement and all was well. Then there came RTTY, again it was agreed that the CW band would be split with CW in the bottom half and RTTY in the top half, with some flexibility between the edges, and this was agreed to by all, after some discussion, then there was AMTOR, again this was discussed in a gentlemanly way and we shared the RTTY segment with those guys.

But then came the black boxes and the packet guys, and they said: "ours is the perfect system, error free and self correcting." But we want every frequency that we can get our hands on, SSB, RTTY or CW, we don't care! We want it, because your QRM is ruining our file transfers.

So maybe it is not error free, and maybe it is not as good as people try to lie to us that it is. Oh come on Chaps, Let a little common sense prevail and let us return to being gentlemen. From what I have seen of some of the Packet operators, that would be the hard part of the act. We were a happy family until those Packet racketeers appeared. Maybe one day they will realize that they are not the end all to be all, and start operating like good amateurs. We hope, maybe in vain, and now even the ARRL has been injected with the Packet stupidity.

DE DX1 (VK2SG)

Any constructive comments??

AUGUST DX

In spite of all my griping about the conditions, some very interesting DX has shown, and those who were either persistent or lucky were able to catch such as: EA9MY, AH9C, FK8BK, FK8FZ, FK8PL, 6W6JX, V21AR, V31AR, V31AO, 9V1JY, TR8JLD, RF6FC, VQ9RB, J2BTY, C31RI, J39BS, YS1RJ, TK5IU, TK/DL7HZ, TL8GM, FP5DX, SV0CR (Crete), TU1UI, TU2BB, TY1PS (Benin), ZD8BOB, VP2V/JH41FF, UQ2HO, C56/6W6JX, BY4AA, V51P, VP8BFH (Falklands), UJ8JCQ, BV4VB, ZD9BV, P43SF, HS1BV, XX9JN, TA3B, BY4AA, CE0ZIG (Easter Island), 9J2AL, JW7SP, JW5WBA, JX9CAA, CN2YL, HV3SJ, LY2WW, PZ1BS, ZK2WL, ZK1XY, A41JW, VS6UW, SU1ER, 9L4BR, 5Z4BH, 5Z4BI, TZ6VV, FO5EM, plus quite a few more, but my Dear Editor is stingy with space.

Anyway, if you need times and frequencies of sighting, or QSL routes, please feel free to access my APLINK Mail Box, scanning 21074, 18102, and 14074: Link with TGVT, Log in and then ask for: "LTO DX". This will give you a listing of current DX bulletins, which you can browse to find what you want. Many rare DX Stations, are pretty regular in operating times and frequencies, depending upon band conditions, and you can find their habits in those bulletins.

So, at the very end of the month, with the drop in A-Index, 10 Meters opened up again, and there were VQ9RB and ZD9BV, both 599, within two Kcs of each other at 1700Z on 10. And the ARRL PFB stated that things are going to get better in the next month or two. The DX season has not started yet, according to them. Wonder why I have been spending all this time on the radio?

DX PRACTICES

Many times I have been trying to tell the newcomers to DX about RYRY, which is a "NO NO'. Use the Letters RY only if they are part of your Call Sign. They surely are not a substitute for "CQ." Nor do they do much good if you use them in a call to a DX station, except to get him mad at you and decide not to reply to you, when your call finally appears on his screen. After three lines of RYRY, a couple of lines of his Callsign and your Call Sign once! Some of you may think that I am exaggerating, but I have seen it (no names or calls) and it does not result in a QSO with that rare one.

At times, when we don't hear the station working the Rare One come back, we are anxious that the "Rare One" will leave; so we throw in our Call a couple of times, say one line of times.. hi! All of us are guilty of that at times (except the Saints) and if I did so, on top of another station, I hereby tender my sincere apologies. On RTTY it is just not possible for the "Rare One' properly to copy more than one station at once.

VQ9RB, Dick, gave me this for you to consider:
"RGR John, misses a bit to QRM.. It constantly amazes me that people think I can copy two stations at once on the terminal.. HI.. I also appreciate the folks who constantly remind me of my own callsign by sending a couple of lines of VQ9RB. That said, I will be on for the CQWW RTTY test if at all humanly possible. TG9VT DE VQ9RB".

Dick, VQ9RB, is an experienced RTTYer, used to pile-ups. He used to be active from S79D in the Seychelles and I worked him there on RTTY and was always pleased to see how well he handled the pile-ups. So, Dick knows what he is talking about.

Moral of the story: the DX Station well knows it's own callsign, use it once if you wish, but generally just give your own Call, a reasonable number of times: no RYRYRY, that is plain QRM.

And finally, do as I say, not as I do. I too get excited about a new one, they are getting scarcer and scarcer, and I do call too long and sometimes on top of someone in the excitement about Country No. 276. Hi! Sorry about that, a "DXer Unlimited" is not supposed to have any human failings.

CHIAO

I am already late this month for the submittal of this DX Column, so will cut it short here. Hope that the readers liked the Editor's idea of putting the "DX COMINGS" separately. That way you can see what is coming at a glance without having to wade thru my verbosity. Comments appreciated.

Go get that DX, it is there alright. And if the ARRL PFB is right, the conditions should be there to get it. Boy (Girl), wish I were retired! Thanks to all of you who have made this DX column and the DX COMINGS possible, including, but not limited to: VK2SG, W2JGR, OD5NG, HA8XX, AA6BB, 15FLN, JG1NBD, W6PQS, HK1DLG, K6WZ, OH2BH, KU9C, W9CD, KE5HE, UT5RP, and lots of others, who helped me with information during the month.

May God Bless you and give you all the goodies to come, and may propagation stay at reasonable (hopefully excellent) levels, as forecast by the ARRL.

Hope to see you all in the CQ WW RTTY Contest on 29 and 30 September.
de **JOHN, TG9VT**, from Guatemala, the Land of Eternal Spring.

KANTRONICS UPDATE V 3.0

A new V. 3.0 EPROM update is now available for the Kantronics KAM, and KPC series TNCs. This latest firmware is being provided at a reasonable cost in keeping with their company policy. The new update includes such changes as: PBBS, now supports reverse forwarding; NAVTEX/AMTEX (KAM only) not only supports NAVTEX but also the NEW AMTEX system being used by the ARRL; AMTOR 625 now supporting 7 character or 9 digit SelCals; RESTORE, a new command that allows you to go back to the permed parameter values; HOST MODE; SOFTWARE CARRIER DETECT, allows for control of the squelch; BEACON; CWID; PREKEY and POSTKEY (KAM only). For further details, contact Kantronics, Co., Inc. 1202 E. 23rd St. Lawrence, KS 66046

DX COMINGS by John Troost, TG9VT

WZ6Z/ST4, SUDAN, has not happened yet: An RTTY Unit was sent to him, but it seems his employer was not very appreciative and thought it might endanger Company operations, so the unit was sent back to Steve, KU9C. But don't give up hope, they will let it cool down for a while and then give it another Big Push.

As of this time, there is a good chance that KU0C will be active on our favorite Mode from **XX9SW, MACAO**, Mid-September. We wish Steve luck.

TAKA SAN, JG1NBD is still all set for the **SYCHELLES, S79** for 12-17 September.

OGASAWARA, JH1QDB/JD1 is still all set for September 23, thru the end of the month, including the CQ WW RTTY Contest.

JH2BNL and J12U1Y will operate separately from **BELAU, KC6CW** and **KC6DX** from 13 to 16 September. After that they will go **YAP ISLAND** in **PALAU** from 16 to 19 September.

SOUTH GEORGIA and **SOUTH SANDWICH, VP8SGI** and **VP8SSI** are still on schedule for 22 November thru 3 December and 25 November thru 5 December respectively. RTTY Gear is furnished by the International RTTY DX association (IRDXA). The price of the trip is very high, near $140,000 and donations would be appreciated to Jerry Branson, 93787 Dorsey Lane, Junction City, Or. 97448, who writes me that if the expedition is cancelled due to lack of funding, all donations will be returned, but that, at this time, all looks good for an All Band/All Mode Operation.

Robert, **3B9FR, RODRIGUEZ ISLAND**, should have received the RTTY gear from IRDXA by the time you read this and he is very excited about it, so you can expect an intensive operation. It was shipped from California on 23 July by air, but part of the trip is by boat, and if the package missed the boat, it will arrive late September instead.

P29BT, PAPUA NEW GUINEA will receive his IRDXA RTTY machine in September, so watch for him to be active on this mode.

ZD9BV, TISTAN DE CUNHA, is now active with the IRDXA RTTY gear. He is getting married in September, so please work him as soon as you can. Influence of XYLs on RTTY is not always positive. (What are you doing there all hours of the night, talking to strangers; come to bed!)

IRDXA has written to **FH8CB, MAYOTTE**, offering RTTY gear; we'll see.

It looks surer and surer that F2JD and CE3BFZ will activate **JUAN FERNANDEZ ISLAND, CEOZZZ**, in Mid November: RTTY gear by IRDXA, with a Hal Telereader borrowed from Jules, W2JGR.

Nothing has been reported about **9X5/GOLLZ, RWANDA**. He is waiting for a permanent callsign and will be in Rwanda for the next 6 years and supposedly has RTTY gear.

The **T19, COCOS ISLAND** digital expedition has been delayed.. We'll keep you posted.

The **HKOTU, MALPELO ISLAND** is still very much scheduled for early November. ICOM has offered to lend 6 ICOM 761 radios to the group, plus some satellite gear. The RTTY operator is the well known RAUL, HK1LDG. IRDXA is shipping a VIC-20 for the operation. They still need many items and the cost is high. Contributions please to: HK3BED, Arturo Afanador, POB 584, Bogota, Colombia. Registered mail please.

HA8XX and HA9RE with a group, will make a D-Expedition of the South Pacific. Operating spots will include CATHAM ISLAND, KERMADEC, plus probably **NORTH** and **SOUTH COOK**. It is scheduled for November and December. They are looking for help on IBM compatible Radio Programs. If you can help, please mail to DR. Milos Danko, POB 127, H-6201 Kiskoros, Hungary.

JOHNSTON ISLAND, AH3C, will be active on RTTY for one month, starting late September.

VP2EBN, ANGUILA, will be operated by KA3DBN from 1 to 8 October, with heavy emphasis on RTTY.

YEMEN, 707AA, the club station, is interested in RTTY. They would like to have someone come to Yemen, bring RTTY gear, show them the tricks of the trade, and leave the gear there. For further information contact 15FLN and F6EXV.

St. Paul Island, CY5 to be activated for 11 days starting October 29. Watch for Callsign of CY9DX. RTTY on 15 and 20 Meters. Donations appreciated. Send donations and QSL to Patrick, FP5DX, P.O BOX 4202, 97500 Saint Pierre et Miquelon, N.A.

GL de John Troost,

...Brings You A Better Experience

Keyers

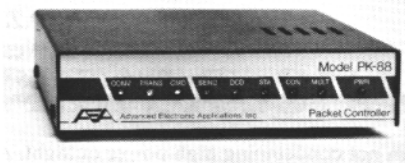
The Morse Machine MM-3 Keyer

The Morse Machine has all the features you need in a memory keyer, including 2 to 99 WPM speed selection and over 8,000 characters of soft-partitioned memory. Twenty memories store your messages...as short or as long as you like. Memory can be expanded to 36,000 characters. All memory is backed up by an internal lithium battery.

Comprehensive Morse training facilities are built-in. **A Proficiency Trainer** for random code group practice. **A Random Word Generator** which generates four-letter words and **A QSO Simulator** which allows you to call stations, answer a CQ or listen to realistic on-the-air QSO's.

The MM-3 also features automatic serial number insertion and incrementing in any memory message. Use the front panel knob to adjust your sending speed or enter a precise speed with the keypad, toggling between the two at any time. Exchanges can be expedited by having parts of your message sent at a higher speed. You can even add remote switches for four of the memories to send your response or call CQ. The MM-3 can also be programmed for automatic beacon use. The RS-232 compatible serial I/O port provides computer control of the MM-3 and monitoring of the Morse training features.

Packet

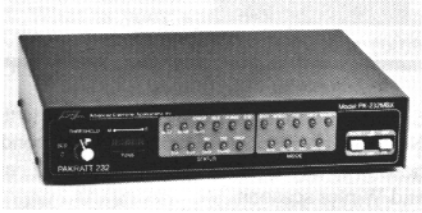


PK-88 Packet Radio TNC

Unique operating features with a proven hardware and software design make AEA's PK-88 your best choice in packet radio--now with MailDrop, an 8KByte efficient personal Mailbox. The PK-88 also allows multiple single frequency QSO's, digipeating and networking. It's a superb value, packed with all the most needed packet radio features such as direct interface capability with NET/ROM and TCP/IP. In addition to all the features of a "standard" TNC, the PK-88 offers features not found in any other TNC:

- WHYNOT command - Shows reasons why some received packets are not displayed.
- "Packet Dump Suppression" - Prevents dumping unsent packets on the radio channel when the link fails.
- CUSTOM Command - Allows limited PK-88 customization for non-standard applications.
- Enhanced MBX command- Permits display of the data in I- and UI-frames, without packet headers and without packet headers or retried frames.
- Enhanced MPROTO command - Suppresses display of non- ASCII packets from Level Three switches and network nodes.

Multi-Mode



PK-232MBX Multi-Mode Data Controller

With over 40,000 units sold worldwide, the PK-232MBX is the world's leading multi-mode data controller. Combining all amateur data communication modes in one comprehensive unit, the PK-232MBX offers Morse Code, Baudot, ASCII, AMTOR/SITOR 476 and 625, HF and VHF Packet, WEFAX receive and transmit, TDM, as well as commercial standard NAVTEX automated marine information services.

All software is on ROM.

- 20 front panel status and mode LED indicators
- RS-232 compatible
- Exclusive SIAM™ Signal Identification and Acquisition Mode
- TDM Time Division Multiplex decoding
- PakMail™ mailbox with selective control of third-party traffic
- FAX printing - supports most printers
- Two radio ports
- Host mode for efficient program control of the PK-232MBX
- KISS mode for TCP/IP networking protocol compatibility
- 32K RAM lithium battery-backed
- Many features for the digital SWL

Antenna Tuners

AT-300 and AT-3000 Antenna Tuners

For tuning perfection, choose AEA's AT-300 (300 watt) or AT-3000 (3 kW) antenna tuners. Quality and exceptional engineering are built-in for maximum performance and long operating life.

The low-pass design provides more harmonic attenuation for lower TVI and allows matching to a much wider range of antenna impedances than common high-pass designs.

The AEA tuners feature a frequency compensated dual-movement SWR meter for ease of tuning with a front panel power range switch. Minimal SWR is achieved by inductors with 18 (AT-300) and 20 (AT-3000) taps. AEA's exclusive patent pending CAM switch design on the AT-3000 provides accurate tuning. The built-in front panel antenna switch allows you to easily select two unbalanced (coax-fed) antennas, a dummy load or a balanced antenna.

Advanced Electronic Applications, Inc. 2006-196th St. SW/P.O. Box 2160 Lynnwood, WA 98036 206-775-7373

AMTOR

Eddie Schneider, W6/G0AZT
1826 Van Ness
San Pablo, CA 94806

Summer is coming to a rapid end, at least in the Northern Hemisphere. Hopefully band conditions will improve during the Autumn (Fall) and Winter seasons.

After last month's marathon listing of APlink mail boxes, I hope that some of you who have not tried or dared to access them, plucked up the courage and had a go. Using these MBOs can be fun and very useful if band conditions do not allow for direct contact with your friends. Why use the telephone or write letters, when we have such a sophisticated method of leaving messages for each other.

QRP or QRO in ARQ

AMTOR ARQ works extremely well with the minimum of power. It has been proved many times in the past that, even with only FIVE watts output from both stations, an ARQ link can be maintained. Traffic may slow down a bit if there is a burst of QRM or QRN, but that is not all bad. It gives the non touch-typists like me, a chance to try and keep ahead of the cursor.

Some years ago, AH6D, Paul, W6WIS, Ken, and KB6FW, Larry, conducted some random tests passing message traffic for the 1983, 1985, and 1987 Trans-Pacific Yacht Races. Although they did increase power to 500 watts in their trails, they concluded that a typical 50 to 100 watts in ARQ was the most efficient method of sending digital data. Incidentally, the group also tried sending the same data in Baudot and HF Packet. Guess which mode won, hands down! It sure wasn't Packet.

I am sure a great many of you have tried reducing power during a contact, and by and large, you were probably extremely surprised at the results. If you have not tried QRP, give it a whirl.

The next time you are tuning around the AMTOR portion of any of the HF bands, take some time off to listen to some of the other signals on the bands. It will not be too difficult to find some of the 500+ watters. Naturally they will be loud, but SOME of these signals can be heard clicking away, with equal strength, one, two or even three Khzs above or below their actual transmit frequency.

I am not condemning high power outright. A lot depends on how one tunes the amplifier, sets the microphone audio input level and so on. Even stations running low power and using AFSK, can cause problems with key-clicks and be transmitting on two or more frequencies at the same time.

KA1AE, Wilson, proved that QRO is possible with a clean signal. He conducted some experiments with a DX station as follows: 1. 50W output, no processor; 2. 200W output, no processor ; 3. 200W output, with processor

In the first two instances, his DX contact could not detect any clicking plus or minus 10Khzs from the transmit frequency. With the processor on, Wilson was taking up 8Khz and would have been very unpopular with the rest of us Amtorites had he continued to chirp away.

No doubt there are many more AMTOR users who have spent good money on getting full QRK capabilities for their KW. If you MUST use an amplifier in ARQ, have YOU checked to see if you are occupying more than your fair share of this narrow band mode? Let's face it, we have only a very small "allocation" for AMTOR in each sub-band. It would be nice to pack as many QSOs as possible within that sub-band, without getting splatter from badly tuned signals.

Remember, when using AFSK, monitor your ALC and keep the audio input (mic gain) down to a minimum. Over-driven audio input in the digital modes can cause more problems than on SSB. FSK is supposed to be as clean as driven snow, however, it would still be wise and courteous to other users, to make sure that your transmissions are not taking up too much spectrum. NEVER use the speech processor in the digital modes.

ARQ-9

What is ARQ-9? At first glimpse it could be the new designator for a Ham Satellite or a new dish on a Chinese restaurant menu. Seriously folks, it appears that someone is not satisfied with the fairly slow block sent by the ISS (Information Sending Station), to the IRS (Internal Revenue Service, oops, I mean, Information Receiving Station). To speed things up a bit, there are plans afoot to make the ISS send a block of 9 characters before waiting for an acknowledgment from the IRS. I am not sure how this extended character block will affect the full ARQ mode data cycle of 450MS, but I am sure that due consideration has been given to any problems that may arise. Watch this space for further developments.

It appears that K4OQ, Bob, has friends in some very high places. In his letter to me requesting mods for his IC740, Bob commented on the rather slow throughput in ARQ and that he could do better with his Vibroplex. If ARQ-9 becomes the "norm" maybe Bob will discard his Vibroplex? Incidentally, what is a Vibroplex?? Hi!

AFSK USERS

Last month, I asked if any of the AFSK users had figured out a way of using their CW filters for receive in LSB. (USB in Europe) Well, Dave, KD2YG, has succeeded in taking advantage of narrow filtering in his TS140S. Here's what he does: First of all, your Modem/TNC and software must be capable of reverse or inverted tone operation, and the parameters have to be set to RX-R and TX-R. The second important requirement is that your rig must have two VFOs.

Select "split" Set VFO "A" in CW and select Narrow Filter Set VFO "B" in USB Set RIT to plus .8Khz (this should overcome the CW offset but some experimentation may be required to resolve the incoming signal). Further "twiddling" with IF shift and so on, may also be required.

Receive will be on CW Narrow ,and transmit on USB. Tune around the band in CW Narrow until you catch a likely target. Push A=B (both VFOs should go to the same frequency). Activate VFO "B" and select USB. Then return to VFO "A" which should still be in CW Narrow and call the station you wish to work.

As Dave says, all this button pushing sounds very complicated, but he claims that it only takes him about one second to do all the necessary.. Dave has worked a few "new" ones using this method of reducing the QRM in a pile-up but I bet he is thankful that the DX station did not run a "split" operation. Hi!

A couple of words of warning. Make sure you are in the split position and your RIT in "ON", otherwise you will probably be typing to "pie in the sky" or QRMing someone up or down the band. Finally, Dave says that using "his" method of narrowing the RX is "non-invasive." If you don't like the results or they do not work on your rig, at least you have not had to climb around in amongst all those wires and components. Thanks for your input Dave.

EDITOR's FAUX-PAS

1. Under last month's DEFINITIONS heading,

our esteemed editor omitted SLAVE. The SLAVE station is the one that responds to an ARQ call initiated by the MASTER, using your Sel-Cal.

2. If you want to leave a message for me in any APlink MBO, you must address your message to: SP G0AZT. APlink does not recognize the "stroke, slash or oblique" in my "alien" callsign.

That's it for this month. Happy and successful chirping to you all. 73 GL and DX

de Eddie, W6/G0AZT ■

DX STOP THE PRESSES!Look for me in the CQWW/RTTY Journal contest, all bands and hopefully with the call ZF1RY from Little Cayman. QSL, with return postage PLEASE, to: PO BOX 5194, Richmond, CA 94805 USA

INTERNATIONAL

byline: **Hiroshi Aihara, JH1BIH**
1-29 Honcho 4 Shiki
Saitama 353, Japan

Hello Friends: I am very glad to have a chance to put a small article in the Journal. JA1JDD, Taka, wrote a history of Japanese RTTY on February issue last year. Therefore, I am going to show you the current Japanese RTTY situation.

About myself:

First of all, I think I should introduce myself. I was born in 1950 and now 40 years old. I have been married fifteen years. I have a daughter who is only 10 years old and am living with my parents.

I started amateur radio in 1966 with a homebrewed CW transmitter and a receiver at the beginning. And I obtained an old Kleinschmidt ASR from one of my local Hams in 1977. Then I started RTTY operation with much fun. Of course, I am a chaser of DXCC. The number of my RTTY DXCC issued by RTTY Journal is #87. Now I am making an application to ARRL DXCC with confirming 255 countries. And I have been an RTTY columnist of Japanese CQ magazine since May 1988.

From the recent to the present: There was very small number of RTTY stations in the age of mechanical machine in Japan and all of RTTY bands were not crowded. There were two reasons about it. One of them was that it was very hard to obtain any of RTTY machine until 1978. Another reason was that Japanese woody house was not suitable for operating a mechanical RTTY machine, whoever have used any of mechanical machine like Teletype M15 can understand how noisy it is. Besides most of Japanese were not familiar with keyboard typing in those days.

In 1978, the situation changed suddenly after TONO 7000 which was an item of electric RTTY equipment was released from TONO Corp. As this is very famous gear, I guess many of you know and have handled it. The 7000 sounds no noise because all characters are shown on the video display. I take it for granted that current RTTY systems do not sound, but the 7000 was an epoch-making system in those days. There was a jump in the Japanese RTTY population after releasing no sound RTTY system like this. At the same time, when these system became popular, the micro-computer come into wide use. And lots of younger people who can handle the keyboard well started to operate RTTY with their micro-computer systems. So there is no day that you cannot hear any of RTTY signals on Japanese RTTY bands. But the absolute number of RTTY population in Japan is rather smaller than the other mode like CW and SSB. I believe that the number of active RTTYers is less than one hundred. Especially, we cannot hear the signals from JAO.

This questionnaire sent to Japanese RTTYers and the results.

I took a survey to 50 Japanese active RTTYers and received 34 answers. Following are a part of the questions and answers.

1. What is your transceiver?
Homebrew-1, TS940 -9, IC780-6, TS930-4, Others(14) (Some stations are using two or three sets).

2. How much is your output power?
Less than 10W (7%), less than 100W (51%), less than 500W(41%)

3. What is your antenna? (for 20 meters)
Mono-band Yagi (20%), Tri-bander (60%), Others (20%)

4 What is your terminal unit?
Homebrew (50%), Others (50%) (Most of homebrewed terminal units are ST-6 type) TONO 5OOO (8) , PK-232 (6), TONO 777 (6)

5 What mode are you operating except Baudot?
AMTOR (58%), Packet (23%) (Most of Packet operating bands are V,UHF).

From this result, I found that lots of Japanese RTTY stations had high-grade transceivers, high-power and beam antennas. (But still IC-720 is running in my shack. hi.) Recently some stations took bad manners when I was monitoring a pile-up to the rare DX stations. It is very pity thing indeed. Then I gave a warning to readers about these bad manners in my column before. I believe that increasing of RTTY population after 3Y(Bouvet) expedition caused this problem. It seems a gentleman's agreement of Japanese RTTYers is going to be destroyed.

DATA BANDPLAN in JAPAN

The RTTY band plan in Japan is not separated for BAUDOT, AMTOR, PACKET. JARL

Hiro, JH1BIH giveing us a look at his very neat station.

(Japan Amateur Radio League) decided it as data communication bands as follows:

3.520- 3.525MHz

7.025-7.030MHz

(7.030-7.040MHz can be used for DX contact.)

10.140-10 150MHz

(Shared with CW.)

14.070-14 100MHz

(14.100-14.110MHz can be used for DX contact.)

18.100-18 110MHz

(Shared with CW)

21.070-21.125MHz

24.920-24.930MHz

(Shared with CW.)

28.070-28.150MHz

Having been deadly heavy QRMM from CW and SSB on 3.5MHz and 7MHz, we cannot use these bands for RTTY operation at all. On the other hand, 70 to 80kHz segment is used for mainly AMTOR, 80 to 100kHz for RTTY, 100 to 110kHz for DX PACKET contact on 14MHz to 28MHz bands. But, most of Japanese stations have used below 90kHz each bands because of QRM from DX PBBS stations especially around 97kHz. Of course we have some PBBS stations on the band, but they are running their stations from 100 to 110kHz. Then we have no QRM from JA PBBS, but sometimes we cause QRM by DX PBBS under the good conditions.

Japanese DX Hunting;

Lots of Japanese RTTYer have been chasing rare DX stations. I guess that they make rather more contacts with DX stations than the domestics. More than 90 percents of my RTTY contacts are made with DX stations. I don't know the reason, but many stations are calling CQ-DX every day. And we would like to gain our DXCC score. (Include me!) hi hi. We are always looking for Caribbean stations and expecting to work with them, but it is very difficult to get a call back from them because of not only the propagation between these two areas but also there is W's extremely high wall. The opening period between JA and Carib is very short. And, there are always lots of North American stations on the band during Caribbean stations being on the air. They are also calling Caribbean so that there is seldom callback to JA from Caribbean and their callbacks are almost given to North American. JA's weak signals exist among the strong W's signals so that sometimes please make a band clear for a while. We eagerly want Caribbean stations listen carefully for JA. Now Gin, JA1ACB, his score is over 300 countries, of course, this score is the top of the world. And, he submitted his QSL cards to ARRL for the DXCC last March. You can find his callsign on the QST this coming December. And, I believe that about ten Hams got over 200 QSLs at this moment.

A little problem:

As I mentioned above, the number of Japanese RTTY stations has increased with the realease of electronic RTTY gear and is still increasing. Although these newcomers who are using their micro-computers have a knowledge about computer systems, they don't know how to operate amateur radio. Thereby causing a bit of confusion on the bands.

This is the story of the current Japanese RTTY situation. I guess that we have a nice condition until next spring. Please call me when you find me on the band. It is the pleasure for me to make contact with you. See you on the band.

73 de **Hiro, JH1BIH** ■

Toyko RTTY DX meeting held February 8, 1990. Standing L. to R. JA3DLE, JA1DXV, JH1QDB, JA1HGY, Mr. Ikegami (Yaesu Co.), JA1JAN, JA1DI, JA1IQV. Seated L. to R. JA1BDF, JH1BIH, JA1BWA, JA1ACB, and JA1BLV. Definitely a distunguished group of RTTY DXers. Tnx Hiro.

WHICH IS A BETTER RECEIVER - YOUR EAR OR YOUR FM RIG?

byline: **Phil Anderson, W0XI**
President, Kantronics Co.

You might be surprised at how sensitive the human ear is, I was. But first, you are probably wondering why in the world is Phil dinking around with such a weird question in the first place? Well, I was looking for some technical information in the Reference Data for Radio Engineers handbook and noticed a chapter entitled Electroacoustics.Well, we had to browse at least!

In the chapter, I noticed a table on intensity levels. The threshold of painful sound is listed as about 1000 microwatts/square centimeter. At the bottom of the table the reference level or "threshold of hearing" is listed as 10 to the minus tenth microwatts/sq.cm. Another way of saying this is that the threshold of hearing, less than a whisper at five feet, is 10 to the minus sixteenth watts/ sq. cm. WOW, what a dynamic range!

Well, how does this compare with our 2 meter FM rigs? My Kenwood has a sensitivity of about .2 microvolts for 12dB SINAD. Guess we can't exactly compare apples to oranges; however, we can roughly compare the "threshold of hearing" to some power level.

To make the numbers easy (sort of make it a Fermi problem), let's assume that my FM rig has a sensitivity of 1 microvolt. Then, the power level would be V>2/50, or .02 X 10>-12, or in other words about 2 times 10 to the minus 14th watts.

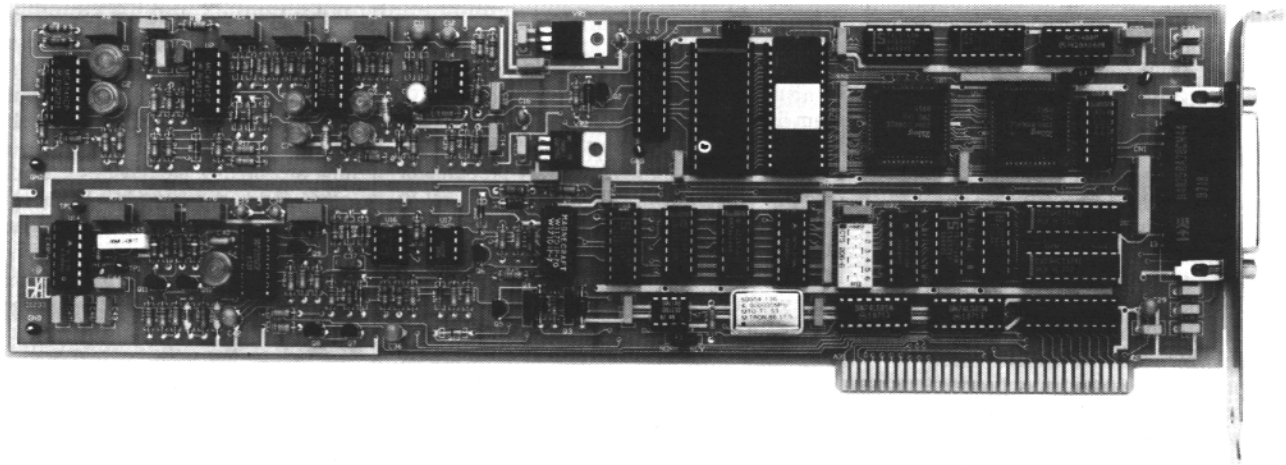
In dBm then:	the ear	FM rig	measure
threshold of hearing	10>-16	2*10>14	watts/sq cm
or	-130 dBm	-107dBm	dBm
or @.06 uv	-130dBm	dBm	

With a super-sensitive FM rig a level just below .1 of a microvolt is reachable. At that level, with our rough apples versus oranges comparison, the answer to our original question is a TIE; the threshold of hearing is about the same.

Of course, weird questions like this lead to other weird questions. For example, does anybody out there have a converter from 2 meters to audio at no gain? Oh, I guess it would have to have an FM converter built in. Don't write me, this article is only a brain teaser. It is meant to stimulate you into thinking about your radio a little more often, about how beautiful it is and how it does such a good job. All to often we take our new devices for granted and don't give the engineers credit for their work in designed us real "State of the Art" gear.

73 de **Phil, W0XI**

A Winning Combination . . .
The PCI-3000 and SPT-2 from HAL!



The HAL PCI-3000/PC-AMTOR system is designed to put your PC on the HF bands with outstanding performance at an affordable price. Amtor allows you to get through when other methods fail. If you've ever been DX-ing with someone on Amtor when 20 meters dies out in the evening, you know what we mean. Things may slow down, but you can usually keep up the QSO!

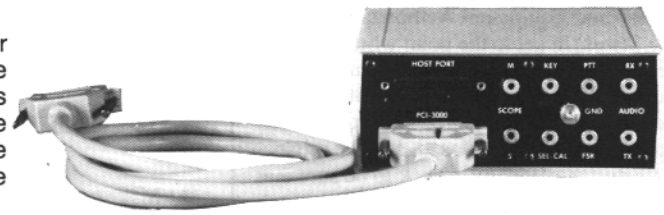
The PCI-3000 doesn't limit you to Amtor. You also get high-performance Baudot and ASCII RTTY, CW, and Search Mode. Search Mode lets you simply tune in the signal—we take it from there. The PCI-3000 automatically finds the correct code, speed, and polarity. No more guessing!

If you want to communicate on HF, do it right with the PCI-3000! Call HAL Communications—your AMTOR source—and put your PC on the air today!

SPT-2 Spectra-Tune:

For ease of tuning your PCI-3000, add the SPT-2 Spectra-Tune. The Spectra-Tune lets you tune in CW and RTTY signals quickly and accurately with a calibrated linear 30-segment bar graph. The bar graph represents a 600 Hz range of the audio spectrum, centered at 2210 Hz for RTTY and AMTOR, and 800 Hz for CW. Calibrated marks indicate the proper frequency for AMTOR, RTTY, and CW tuning.

A cable is included with the SPT-2 for providing power and control from the PCI-3000. The rear panel of the SPT-2 provides convenient "RCA" phono connectors for all radio connections. This avoids having to make radio connections directly to the PCI-3000. Enhance your PCI-3000 system with the SPT-2 Spectra-Tune Today!



HAL Communications Corp.
P.O. Box 365
Urbana, IL 61801
Phone (217) 367-7373
FAX (217) 367-1701

PCI-3000/PC-AMTOR with software **$395.**
SPT-2 Spectra-Tune with cable **$169.**
FIL-1 Amtor/RTTY filter (installs in SPT-2) **$69.**

(Low tone export models available.)

CIRCLE 58 ON READER SERVICE CARD

Computer Generated RFI and Amateur Radio

byline: Philip Graham, KJ6NN

I am sure that we all have received a phone call from a neighbor who complains about our radios interference with some device in his home. If you are a good neighbor you might go over to your neighbor's house with your RFI tool kit and work to solve his problem.

What can you do when your own computer is causing a problem in your radio room? Noise from the computer can wipe out entire bands or sections of bands that you would like to use. If you are using the non-digital modes (SSB,CW) you might just turn the computer off, but for the digital modes you need the computer on. If you have this problem then you know how serious this can be. In this article, I will share with you some of the techniques that I have developed and have applied in my station at home. These techniques can be applied to any digital device, although this article specifically targets the personal computer.

HOW THE FCC HELPS

First of all, if you have not purchased a computer yet, take these words of caution: MAKE SURE IT HAS FCC LEVEL "B" COMPLIANCE. The FCC has two standards for radiated compliance, FCC level "A" and FCC level "B". FCC level "A" is applied to business computers and is the less stringent of the two standards, FCC level "B" is the more stringent (quiet) and is basically the same as level "A" but 10 dB less noisy. FCC level "B" devices are allowed for resale for home use and I would only purchase this type for the Ham shack due to the improved noise reduction. A 10 dB reduction in noise is a significant amount. To be sure that the device does have FCC level "B" compliance you should get the FCC ID number from the computer and call the FCC "PAL" BBS (301-725-1072).

When you call this number with using a 1200 baud Modem you will move through a few menus (Access Equipment Authorization Database and Equipment Authorization Application Status) to get to the point where you can enter the FCC ID for a device. After entering this information you will then be given the application status for the device, what clock rates (frequency) the device runs at, and the original manufacturing company. Check to be sure that the FCC ID number gives clock rates that match the computer that you considering purchasing. If it does not match, notify the FCC and do not buy that computer or anything else from that company (some companies put valid FCC ID numbers on the wrong equipment, which is why checking the clock rates is important). If all seems OK then the computer is probably OK and will cause minimal RFI problems for your station.

A PROGRAM TO HELP

If you think you have a problem with your computer you may want to run the basic program listed here. The program is called "HARMONIC.BAS" and is very useful for finding where noise can be generated by a computer clock or video monitor (if you do not want to type in the Turbo Basic listing), send me a floppy 1.2MB 5", 720KB 3.5", or 1.44MB 3.5" PC formated disk w/proper postage and I will send you a copy of the compiled (.EXE) program.) Run the program, enter the data as requested and then tune up your receiver to hear these clock harmonics. This can help determine where your noise is coming from. This is not a cure-all, but will help give some hints on where the problems may be originating from.

YOU ARE NOW THE DETECTIVE

Now that you have the computer, and you can tell that it is causing some noise, you need to find out where the noise is coming from. Running the program can help a great deal, since it will point you in the right direction, but with devices such as monitors, keyboards, printers hard drives, mice, joysticks, scanners, MODEMs connected to the computer, it can be difficult to determine what is causing the RFI. This is because one device may be acting as the transmitter and another device could be acting as the transmit antenna.

First of all, fill the computer screen with lowercase "m," this is considered one of the worst case patterns for the computer display (some other worse case letters are "@" and "w"). You may also need to send data to your printer, Modem, or copy files on the hard disk to other devices to maximize the noise. Now that the computer is busy making noise, the best way to start is with the following steps:

- Turn on your radio to the frequency that receives the most noise, turn on the computer and all devices connected and verify that the noise is present.
- Turn off and/or disconnect one device.
- Make a note if this had any effect upon the noise level.
- Turn on and/or re-connect the devices. Repeat the above steps for each device

If you notice that a few of the devices add a significant amount of noise, then these devices may be the transmitter or the antenna for the computer that radiates the noise that you hear.

If this approach does not seem to point out the 'trouble' that perform the above steps in reverse. Start with the chassis with nothing plugged in and then one at a time add each device until you locate where the noise is coming from. In some rare situations you may find that a couple of the devices interact with each other. If you suspect this is happening test your theory by trying different combinations of devices connected at the same time.

NOW TO SOLVE THE PROBLEM

To reduce the noise, obtain some Split-Core toroids (available from MFJ and Radio Shack) and apply these to the offending cable. You may need to put these close to the computer and/or close to the device. This will help tell you if the device to the computer is radiating the noise. If the device has a power cable you may also have to put the split toroids on the power cable as close to the device as possible. In some cases, I have had to put 3 sets of 2 toroids on one cable to solve noise problems, so do not give up if one does not do the job.

If the noise did not drop a significant amount when everything was disconnected from the computer, you may have a problem with the computer chassis or power supply. In this case, the noise could be coming out of the openings in the chassis or out of the power cord.

If noise is coming out of the chassis a bit of common sense and good vision is all you need. Remove the cover of your computer and examine the areas where the top housing and bottom housings make contact. There must be no paint or other foreign matter that would prevent them from making solid contact. If you do find areas that have any amount of paint on them, remove that paint with sandpaper, or paint remover to provide a good contact area.

Another area to check is the top and bottom computer chassis for good contact over a large area. If you find long strips that are not connected to large holes where there is no metal, you may want to purchase some conductive copper tape (made by 3M) from the local electronics supply house and seal the "bad" area by applying this tape to the seams that separate the top and bottom housing. The problem with this solution is that the copper tape is very expensive and the tape does allow multiple application and it looks bad. An alternative to the tape is to add more screws to the computer chassis. Although this can become a mechanical problem, since most computers do not have extra space for screws and you will need to be careful not to short out printed circuit boards disk drives, power supply, etc. with the added screws.

One last item to try is to attach a 1 inch wide (or wider) ground braid to the computer and then to your radio ground. Check to be sure that your computer has a chassis that is to common ground. Although I do not know of any computers with a HOT chassis, check to be sure first with a voltmeter. A good RF ground helps your radio as much as it will help the computer to keep quiet. The last place the RFI can escape from is the power cord to the computer (called conducted RFI). If this happens then the power supply probably does not pass FCC level "B". However, this can sometimes be reduced with toroids on the power cord located as close to the computer as possible. The noise might also be reduced by moving the power cord and all of the optional devices to a different AC circuit. If none of these attempts reduces the noise, you may have no choice but to replace the power supply with an FCC level "B" approved supply.

DOES IT WORK?

Computers can coexist with radio equipment if you follow the steps taken above. Staying away from the cheap clone computers that do not have FCC approval and older computers (before 1981) makes it easier to get the RFI under control and have a happy Ham shack. In my radio room at this time I have 4 computers and none give me a problem. The computers include everything from a 20MHz 80386 to a 12.5MHz 80286. Two of the computers are on 24 hours a day to interface with the local spotting network and the other captures data from a weather computer. One computer is for general use and it is most often off, while the last computer is used of computer logging, RTTY, ARQ, and FEC with either a TS-950SD or a TS- 440S/AT. Even with the very quiet receiver of the TS-950SD I can not detect any RF from these computers.

I hope this helps you. If you have specific questions please send me a packet message to KJ6NN @ N6IIU-1 or write to my callbook address (1990 or later). Please include a SASE if you really want an answer.

Best 73 de **Phil, KJ6NN** ■

Biography: *Phil has been an active Ham since 1987, and was first licensed in 1977. He belongs to the URA (Un-Radio Club). He has worked for several computer companies as an engineer, project manager and is an engineering manager for personal computers.*

For further information on the HARMONIC program or to obtain a disk copy, write direct to:

Philip Graham, KJ6NN

723 Berkshire Pl.

Milpitas, CA 95035

HARMONIC PROGRAM

```
'
'Copyright (c) 1990 by Phil Graham
'   All Rights Reserved
CLS  SCREEN 0:COLOR 12,0,0
LOCATE 3,22:PRINT"* * * *  H A R M O N I C  * * * *
COLOR 11:LOCATE 6,39:PRINT"by
LOCATE 8,34:PRINT"Phil Graham
LOCATE 11,18:PRINT"Permission to copy for personal use granted,
PRINT TAB (18);"or for use by Hams approved.  Use for profit
PRINT TAB (18);"or for business not allowed without written
PRINT TAB (26);"permission from the author.
PRINT:PRINT TAB (26);"Version 1.2 -- 30 April 1990
LOCATE 19,23:PRINT"Copyright (c) 1990 by Phil Graham
PRINT TAB (30);"All Rights Reserved
LOCATE 23,29:PRINT"Press any key to start
FIRST:
Q$ = INKEY$:IF Q$ = "" THEN FIRST
KEY OFF
START:
CLS
COLOR 11:LOCATE 4,9
INPUT"How many Harmonics would you like? (Type '0' to end program) ",C%
IF C% = 0 THEN SYSTEM
IF C%2 THEN SELECT1
COLOR 28:LOCATE 8,5
PRINT C%;"is a lot of harmonics.  Are you sure you want all of these? [Y/N] ";
START1:
Q$ = INKEY$:IF Q$ = "" THEN START1
IF Q$ = "Y" OR Q$ = "y" THEN SELECT1 ELSE COLOR 11:GOTO START
SELECT1:
COLOR 11:LOCATE 8,5:PRINT SPACE$ (73)
SELECT2:
LOCATE 8,11:PRINT"Do you wish Harmonics from the [M]onitor or the [S]ystem? ",Q$
SELECT3:
Q$ = INKEY$:IF Q$ = "" THEN SELECT3
IF Q$ = "M" OR Q$ = "m" THEN MONITOR
IF Q$ = "S" OR Q$ = "s" THEN BASE1 ELSE SELECT2
MONITOR:
CLS:PRINT:COLOR 12
PRINT TAB (15);"* * *  M O N I T O R  R E S O L U T I O N  * * *
COLOR 11:PRINT:PRINT
PRINT TAB (8);"You need to look at the worst-case pattern for your monitor.
PRINT TAB (8);"This is an alternating pattern of dot-on / dot-off.  In order
PRINT TAB (8);"to calculate the frequency of the harmonics that your monitor
PRINT TAB (8);"produces, you need to look at a worst-case pattern for a display.
PRINT TAB (8);"This is also an alternating pattern of dots-on / dots-off and
PRINT TAB (8);"is a function of the horizontal resolution of your video card.
PRINT:PRINT TAB (16);"Here are some examples:
PRINT TAB (16);"Monochrome    (MDA) enter: 720
PRINT TAB (16);"Standard Color (CGA) enter: 640
PRINT TAB (16);"Low-Res Color  (CGA) enter: 320
PRINT TAB (16);"Standard VGA   (VGA) enter: 640
PRINT TAB (16);"Low-Res VGA    (VGA) enter: 320
PRINT
PRINT TAB (7);"Other displays/cards will have different horizontal resolutions.
PRINT TAB (7);"Enter the correct value. (You should be able to get this information
PRINT TAB (7);"from the video board documentation.)
LOCATE 23,20
INPUT"What is your horizontal resolution? ",D%
CLS
LOCATE 5,7:COLOR 12
PRINT TAB (13);"* * *  M O N I T O R  D I S P L A Y  T I M E  * * *
COLOR 11:PRINT:PRINT
PRINT TAB (8);"Active display time is the time that it takes for your monitor
PRINT TAB (8);"to write one line of it's display.  All values are in microseconds.
PRINT:PRINT TAB (16);"Here are some examples:
PRINT TAB (16);"Monochrome    (MDA) enter: 43.21
PRINT TAB (16);"Color         (CGA) enter: 44.5
PRINT TAB (16);"VGA           (VGA) enter: xx
```

Continued next page

```
PRINT
PRINT TAB (8);"Other monitors will have different display times.  Enter the correct
PRINT TAB (8);"value. (You may need to call the video board/video monitor vendor(s),
PRINT TAB (8);"or measure horizontal sync [xx] with a scope.)
LOCATE 21,19
INPUT"What is your active display time (us)? ",T
F=D%/T/2
DEVICE:
CLS:LOCATE 8,22
PRINT"To what device do you wish to print?
LOCATE 10,10
INPUT"(Type [C] for CRT, [P] for PRINTER, or enter a filename.) ",Q$
IF Q$="C" OR Q$="c" THEN Q$="CON"
IF Q$="P" OR Q$="p" THEN Q$="PRN"
OPEN Q$ FOR OUTPUT AS #1
PRINT
PRINT TAB (20);"Please enter any short note you may wish.
PRINT TAB (28);"(Press ENTER if no note)
PRINT:PRINT TAB (20)
INPUT,NOTE$
CLS
PRINT#1,""
PRINT#1,TAB (26) USING "Base Frequency: ###.#### ";F;
PRINT#1,"MHz.
PRINT#1,TAB (26) NOTE$
PRINT#1,""
PRINT#1,TAB (24) "Harmonic","  Frequency
PRINT#1,""
FOR X%=1 TO C%
IF X%=18 OR X%=36 OR X%=54 OR X%=72 OR X%=90 THEN GOSUB PAUSE
PRINT#1,TAB (26) USING "###";X%,
PRINT#1,USING "          ######.## ";X%*F;
PRINT#1,"MHz.
NEXT
GOSUB PAUSE:GOSUB PAGE
CLOSE:Q$="":GOTO START
BASE1:
CLS
COLOR 12:LOCATE 5,8
PRINT TAB (18);"* * *  B A S E   F R E Q U E N C Y  * * *
COLOR 11:PRINT:PRINT
PRINT TAB (8);"The base frequency is easy to find.  Look into your computer and
PRINT TAB (8);"locate all of the crystals in the computer.  A 20 MHz. 80386 will
PRINT TAB (8);"usually have a 40 MHz. crystal.  A 4.77 MHz. 8088 will usually have
PRINT TAB (8);"a 9.54 MHz. crystal.  Crystals are in small metal boxes, printed
PRINT TAB (8);"with the frequency, in black ink, on the outside.
LOCATE 17,20
INPUT"What is your base frequency (in MHz.)? ",F
GOTO DEVICE
PAUSE:
IF Q$="CON" THEN PAUSE1 ELSE RETURN
PAUSE1:
PRINT#1,""
PRINT#1,TAB (28) "Press any key to continue...
PAUSE2:
A$=INKEY$:IF A$="" THEN PAUSE2
CLS
RETURN
PAGE:
IF Q$="CON" THEN PAGE1 ELSE PAGE2
PAGE1:
RETURN
PAGE2:
PRINT#1,CHR$(12);
RETURN
END
```

SAN DIEGO SW DIV ARRL CONVENTION

August 1990 saw Southern U.S. Hams invade San Diego for the SW Division ARRL Convention held at the Town and Country Hotel. As usual there was a big turnout but I have no official count at this date of how many. I would venture a guess at about 4,000.

The RTTY Journal hosted a "Digital Digest" forum again this year which had two outstanding speakers. First Bill Henry, K9GWT, President of HAL Communications, Urbana, IL spoke on RFI as it applies to Amateur radio and what can be done about this problem. Bill had a very nice viewgraph presentation and a couple of handouts for the those in attendance. The second speaker was Cole Ellsworth, W6OXP, who writes our "Connections" column each month. Cole's topic was RS-232C and COM ports 1,2,3 and 4 as they relate to Amateur radio. Cole also had a viewgraph presentation and the program followed the format he used in writing many articles for the Journal on the subject of RS-232 and COM ports. Both of these topics were well received and from the questions asked during both sessions, many Hams were starving for this information.

Many thanks to Bill and Cole for these fine presentations. (See pictures below)

Bill Henry, K9GWT, San Diego, Aug 1990

Cole Ellsworth, W6OXP, SAn Diego, Aug 1990

Qsl Routes for DX heard, Worked, and gleaned.

Submitted by Betsy , WV7Y with thanks to the Eastern Washington Amateur Radio Group and the VK2 Packet list.

3W1A Via Alex Lebedev, Box 43, Temirtau-10, Kazah Rep., 472310 USSR
4U1UN was NA2K Qsl home address
5N0ETP Qsl UA9QCQ, or Qsl N6QLQ
5V7DP Qsl KA1DE
5W1HK Qsl SM7PKK
5Z4BI Qsl Bill Hesbitt, BOX 147, Thika, Kenya
6Y5KW Qsl Box 841, Thant Pl, Bridgetown, St. Catherine, Jamiaca, WI
7S4RY Qsl SM4CMG
8P9AT, Wolf Wagner, 12230 St James Road, Potomac, MD 20854, or DL8KY
9L1US will Qsl WA8JOC
9L4BR, Richard, Qsl G4GGN
9Y4SF Qsl WA4JTG
A41JW is Aboulaziz Alla Baksh Al Balushi, Box 7421, Motrah, Oman
A41KB Qsl ON6BY.
C6A/AB4ES Qsl home address
EA6MQ Qsl Callbook address
EA9BH Qsl DL7FT
EA9MY Box 368 Melilla, Spain.
ED5IPE Qsl Via EA5GEO
ED9CI Qsl EA9KQ
EO3AQW Qsl Box 44, Voronezh, USSR
EO5O Qsl UO5OO
FM5FA Qsl AJ3H
FP5DX Qsl Box 4204, F-97500 St Pierre and Miquelon
FY4FR has the home call of FD1MXK
FY5DG Qsl Via at Box 450, Kouru, French Guyana
GJ4YMX Qsl 10 St. Lukes Cres, St. Clements, Jersey, JE2 6QH U.K.
HH2PK Qsl N1DRS
HI8BG Qsl Via Bienvenido Guzman, POB 163-9, Santo Domingo, Dominican Republic
HK0BKX Qsl WB9NUL
HP1XBH Qsl Box 912, APO Miami, FL, 34002 USA
IZ0MR/90 Qsl I0IA
J39BS Qsl WB2LCH
J42DIO Qsl SV2XYT, Box 10728, Tesaloniki, 54110 Greece

J73WA, Wayne, 40 Rodney Street, Portsmouth, Commonwealth Of Dominica, Caribbean
JW7SP Qsl LA3T
JX9CAA Qsl LA5NM
KP6N/KP4 is KP4USA
PY0FF says to Qsl W9VA.
PZ1BS Qsl to Box 813, Paramaribo, Surinam
R0L/UA6XGL Qsl RW3AH
RB5QV Qsl Box 3, Melitovol 332301 USSR
RC8O/UB4MZG goes to Box 22, Schastie, 348913, Ukaraine

RC8P/UB4MZG Qsl to Box 22, Schastie, 348903 Ukraine USSR
RF1F/UA3TT will look for his cards at Box 18 Gorkey 603000, USSR
RO5OO Qsl Via Vadim V Rusvik, Box 26, Kishinev 277012, USSR
RV4F/RT4UY Qsl Box 73 Kiev, 2522909 USSR
RW8T/UZ9OWD, IVAN, Qsl Box 4, Novosibisk-9
SU1HN Qsl Box 1578, Alf Maskan, Cairo
T5RM Qsl HB9RTR, 134 Saules, 1233 Bernex, Switzerland

TA3D Qsl Box 963, Izmir, Turkey
TF/KE0YG is LT. J.G. Randall Jacques, Box 27, U.S. Naval Air Station, FPO NY, NY 09571 USA
TK/DL7HZ Qsl his home call
TK5IU Qsl Box 223, Ajacc 10, Corsica Island
TL8TM Qsl F6FNU
TR8JLD Qsl AK1E
TU1UI Qsl WA8ZWR
TU2BB Qsl N2HOS
TY1PS is Peter Schultz, BP 06-2535, Cotonou, Benin
UA1OJ/UA9Q Qsl Box 27, Severodvinsk, 164500 USSR
UA2WJ Qsl Box 535, Kaliningrad 236041, USSR
UA4FDS Qsl Box 555, Penza 440061 USSR.
UA4WGW Qsl Box 3113, Izhevsk 426006 USSR
UG7GWY Armenia Verevan Indeks 5, Padio Club, 375007 Armenia, Verevan, USSR
UH8AAB Qsl Box 555, Ashkhabad, 744020 Turkmenistan, USSR
UJ8JCQ Qsl callbook address
UY5CJ Qsl Box 55, Melitopol, 332304 USSR
UZ4FWD Qsl Box 144, Penza 440600, USSR
V44KW Qsl WB2LCH
V51P Qsl Box 9080, Windhoek, Namibia
VK9LI Qsl VK2SG
VK0DS Qsl bureau when he returns home
VP2V/JH4IFF Qsl home Call
VQ9RB Qsl WA4DPU,or Dick Barnes, c/o Ford Aerospace Corp, NAV SUPPFAC, Box 55 FPO San Francisco, CA 96685-2000
VU2SJV Qsl N2HOS
YL1IHF Qsl YL1ZW callbook address
YL1WW Qsl Box 50, Riga, 226010 Lat, USSR
YL20ISF Qsl Box 50, Riga 226010 USSR
YL20LSF Qsl YL1WW
YS1RJ Qsl Box 792, San Salvador, El Salvador
ZD9BV Qsl W4FRU
ZL0AIC Qsl HB9AAA

SOFTWARE

Jay Townsend, WS7I
P.O. BOX 644
Spokane, WA 99210

This month the mailbag was completely empty which just goes to show you that all must be well in the digital world of software land. However, I did learn a couple of things and had a couple of good experiences this month which I will relate to you.

PCSWL and PCHF FAX REVIEW

I have been after Dale, W6IWO to find me some new software to review and much to my surprise a box arrived from Software Systems Consulting. They offer **PC SWL** and **PC HF Facsimile** which seemed kind of interesting to me.

Contained in the shipping box were 2 sets of diskettes (3 1/2 and 5 1/4 inch), manuals, a tape and a RS232 connector with wiring. The RS232 device was labeled FSK Demodulator, Patent Pending. Since my mail is picked up on the way to work, while at work I loaded the floppy diskettes on my computer which runs VGA Color and is a nice fast 286. Having always had an interest in Fax and not knowing a great deal about it I loaded it up and ran the demonstration of the pictures that could be copied over the air. Boy I was impressed.

A few days later after a repair session on my Hal ST 6000, a friend Jim, WB7AVD and I fired up the **PC HF FAX** on my home station. I used the tuning guide and tried lots of frequencies and was having a heck of a time. So Jim suggested listening to the tape and seeing what Fax sounds like, we did, and Fax is pretty weird and distinctive sounding. Jim went home and then I came back down to the shack and found a couple of FAX stations as listed in the nice frequency guide in the back of the excellent documentation supplied with the **PC HF Facsimile** product.

It works !! I yelled at Betsy my XYL, WV7Y, to come and take a look as a weather map was printing out on my screen. It was very exciting, about like working some DX. I then went on and copied a couple of pictures and other things on the band.

PC HF Facsimile works just like the documentation tells you and is easy to use. The tuning device which I will explain in further detail makes tuning a breeze in SSB position. I didn't try it in RTTY position.

Well that is the good news on the software and now comes the bad news. I have tried and tried the PC SWL software which uses the same demodulator and many of the same features of the PC HF Facsimile, and it is just lousy. I have no doubts, that either I have something set wrong or perhaps I am just not doing something correctly. The software seems to copy CW pretty good, Amtor is sort of iffy, but with RTTY signals using my radios it is just horrible. In fact, sending RY's and a quick brown Fox message from one side of my station to the other is less than 100 % copy at 60 Db over S9 and no noise at all.

John Hoot, the author states in the PC SWL manual that, for best operation, the center frequency be kept between 900 and 1500 Hertz while tuning RTTY. Now on my ICOM 751 while in RTTY/FSK mode, this is impossible. It expects RTTY to be the old standard 2125 - 2295 Hz. Now this may be my problem I am not sure. But, I think that if it is, then I still don't like the software, because I am not planning on changing years of habits. But a SWL would not have this problem.

The **PC SWL** and the fax software have a feature which is by far and away one of the best I have seen in any Ham software for digital communications -- the tuning scope. This piece of software turns your PC into a virtual oscilloscope and is amazingly accurate in tuning a signal. Software Systems Consulting also has a digital tuning which shows you what the digital signal looks like, another useful tool.

This software also has a couple of my pet peeves included on the hardware side of things. First, the FSK demodulator is contained in a RS232 connector and is totally undocumented. There is no schematic, you basically would have a heck of a time taking the connector apart. Secondly, there also is no pin-out information given on the device this seems rather dangerous to me since the chip clearly has some voltage required and they just assume the computer will have its serial ports setup correctly.

One of the manuals does, however, make reference to an article in 73 Magazine about a single chip demodulator which I suspect might be the basis on which the "Patent Pending" demodulator may be designed?

For the Short Wave Listener which is what the one software and hardware is designed for, it will certainly give them a look into the world of digital for no great outlay of money. The **PC HF Facsimile** is just totally fascinating to me. I am impressed, how well it works, and for a person who doesn't have a multi-mode controller which copies it all (which I don't) it was an exciting look into another world.

GOOD NEWS DEPARTMENT

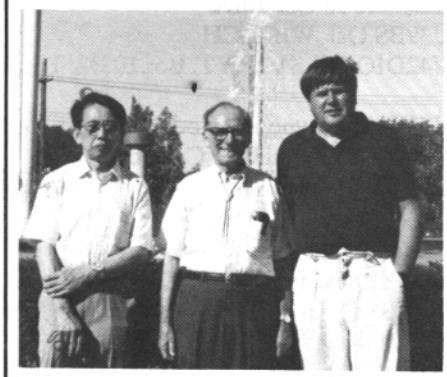
Well now for the rest of the news. Betsy and I are once again venturing to Ecuador for CQWW RTTY. Hopefully, I will be able to operate from Ted, HC5K's home as a single operator. All should look for a funny call -- maybe HD5J or HD5I ??

The other news is that it looks like I am going to have to break down and buy another Terminal Unit. I have the APlink software which uses the new Hal Communications CTI 3000 now and will review it the October or November. My good friend and contesting guru has his logging software (ScotchLog) now sending on the A.E.A. PK232, and I may well be running the PK232 on Transmit for CQWW, and using a Hal Communications ST 6000 for receiving YOU.

It seems kind of ironic to me that NO ONE has a digital program for contesting. To be able to Send/Receive/Log on one IBM Clone computer would be bliss. Write your favorite manufacturer about YOUR wants (Don't forget mine !) 73 de **Jay,WS7I** ■

For more info, contact Software Systems Consulting, 150 Avenida Cabrillo, C, San Clemente, CA 92672

"How lucky can one guy get" says, Jules, W2JGR as he hosted two living legneds of Amateur radio at his home recently. The Titan of RTTY, Gin, JA1ACB and one of the world's outstanding Dxpeditoners Martti, OH2BH.



Gin, JA1ACB, Jules, W2JGR, and Martti, OH2BH

CLASSIFIED AD DEPARTMENT

First 30 words $7.50, additional words 10 cents each. Cash with ad. Deadline for ads is 1st of month of publication. (Example - Ad arrives by 1st of September will be run in the September issue)

HENRY RADIO -- Your Data Communications Place is overstocked with used equipment. We have HAL DS3100's, MPT/MSO's, Demodulators, and the latest NEW items in stock, (ST-8000, DS-3200, ST-7000, etc). Complete line of Advanced Electronics Applications (AEA), used CP-100 and NEW and used ATU-1000, as well as the PK-232 ALL MODE CONTROLLER. Call Henry Radio at (213) 820-1234 in Los Angeles or (800) 877-7979 outside California. Ask for Fred, N6SFD.

FOR SALE: Dovetron MPC-1000 CR, Loaded with all the nice features. Solid state display, KOS, Regen, etc. $615 FOB Anchorage, AK. Money Order orCertified Check required. Call or write: Fred, KL7HFM, 1910 Rosemary St, Anchorage, AK 99508 (907) 274-3464

WANTED: Back issues of RTTY Journal, RTTY (Florida), ARTS (New York) and other teletype publications and a gasoline or diesel generator 50 to 100 KW. Orville Magoon, K6DZN, Guenoc Winery, P.O. BOX 279, Middletown, CA 95461

JUST RELEASED: RTTY Journal INDEX for years 1984 thru 1989. If you are tired of looking through back indexes or issues for an article you wish to re-read, then you will want to have this new INDEX in your shack. Order today, by sending $2.00 to the RTTY Journal and we will rush your copy to you. The Index also contains a handy order form for ordering back issues which are available.

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