DIGITAL JOURNAL

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40,000 QSOs from MALPELO

Even local harmonics help with DXpedition on Malpelo Island

IN THIS ISSUE

CLOVER IS HERE!

A new Digital transmission method for increased throughput. Feature begins on page 16.

RTTY *JOURNAL*—

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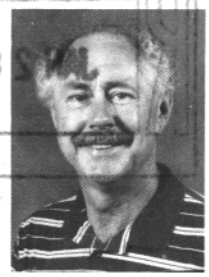


HITS & MISSES

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

DAYTON 91

Have you made plans to attend this event this year. The dates are April 26, 27 and 28. If not, now is the time to make your move. Rooms are hard to come by, so if you plan to go, don't hesitate to make reservations NOW.

As always, we plan to have a very exciting Digital Digest forum for all. It will again be held in Room #4 which will handle a large group. The program will include two outstanding speakers and both will be speaking on their favorite subject.

The first speaker will be Ray Petit, W7GHM, and Ray will be giving us an overview of "Clover." He is presently submitting a series of articles for the Journal to publish on this subject and the first appears in this issue starting on page 16. Ray has been working on this project for some time now and has made great strides in its development. If you are interested in "State of the Art" projects, then you should not miss his presentation.

The Second speaker is well known in the field of DSP. He is Bob McGwier, N4HY and Bob will be speaking on DSP. Bob's work with AEA in the development of their new DSP Modem is well know. The RTTY Journal will be publishing a series of articles written by Bob on DSP in the near future. Some may recall, Bob was presented the Dayton Technical Achievement award for 1989 at last years Hamvention. DSP is the "hot" topic in the digital field and I know of no one more qualified to speak on the subject. So, you won't want to miss this session either.

The RTTY Journal will again be sponsoring the RTTY Dinner that will be held on Saturday night at the Radisson Hotel. Last year found over 75 in attendance and all who attended enjoyed not only the fine food but the camaraderie that only us digital folks are capable of. Each year this group seems to grow, so make plans to attend this dinner if you are coming to the Hamvention. We will have all the details in the next issue of the Journal. Bob Foster, WB7QWG, will again be your host and after the fine job he did last year, we can again expect a feast to behold.

Not to be forgotten, the RTTY Journal will again be hosting a hospitality suite at the Radisson Hotel on both Friday and Saturday nights. Here is the place to meet those you have only QSOed with on the air. Each year brings more of the digital gang to this gala affair. So don't forget, when in Dayton for the Hamvention, always make a stop at the RTTY Journal hospitality suite.

So make your reservations today for the Dayton Hamvention 1991. I'll see you there.

MAILBAG

To those of you who have written to me voicing your opposition to the present band encroachment problems, please be assured I appreciate your input. Even though I may not have answered all of you, this is not an indication that I am not interested. In fact, I have been building a nice file on this topic which I intend to use at one of the upcoming ARRL Digital Committee meetings. That's if I am reappointed by ARRL president Larry Price.

To those of you who have been meaning to write, I encourage you to do so. You should also send a copy to your ARRL area Director so he/she will be aware of your feelings. Letters can be a powerful tool in working out this problem, so please don't hesitate to write to me. If I attend one of these meeting and have only a couple of letters voicing some of our problems, I will not be to effective. But, on the other hand, if I go with 200 hundred letters or more, then I can feel certain our voices will have more effectual. WRITE TO ME, TODAY!

de **Dale, W6IWO** ■

DXPEDITION TO MALPELO ISLAND, HK0TU

Byline: *Raul Gonzales, HK1LDG*

Nov. 3 to 8 1990

At the "Liga Colombiana de Radioaficionados" National Convention June 1, 1990, it was elected the committee to take care of the Malpelo 90 Dxpedition. Since I was one of the members I did not hesitate to obtain help from DX enthusiasts worldwide. John, TG9VT, leading a group of RTTY dxers, helped us obtain equipment, such as, seven new IC-765 and VHF/UHF rigs from Tom, KF7GH, of ICOM. Also support from GIN, JA1ACB and JA Group. Several Associations and hams favorably responded to our request. Here, I present my group's gratitude to all of those who helped make this a successful operation.

MEETING THE GROUP Oct. 28

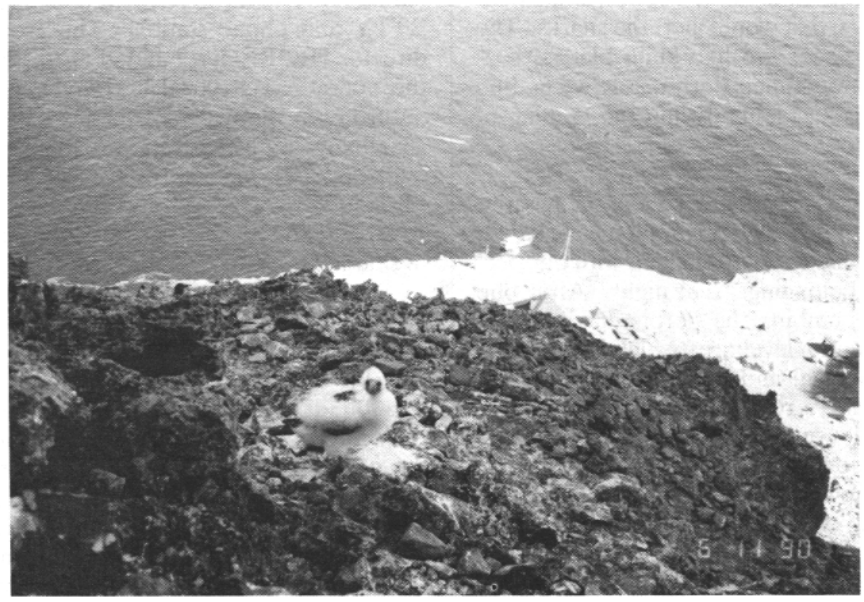
Peter HK1HHX, Dave HK1KXA and I took a plane and flew to Cali City where we got together with the rest of the 15 dxpeditioners including two TV men. We packed several plastic and metal cans with our equipment and our provisions. We loaded all stuff in a military truck for carriage to the seaport.

BUS RIDE TO SEAPORT CITY OF BUENAVENTURA, Oct. 29

We arrived at night and stayed at the "Hotel Estacion," an English style hotel. There we had an official meeting with the Navy Commander and his Officials advising us of what to do for the next few days, especially regarding our safety.

VOYAGE TO MALPELO Oct. 30

At daybreak we got together, as agreed the night before, in the hotel lobby. It was noon time when we left the dock on the Columbian Navy ship "Sebastian de Belalcazar," a tug type ship made in 1943 in New Jersey, USA, where it was put to sea as S.S. Jicarilla (an Indian tribe). It got recognition during World War II with two Purple Heart mentions. By the way, in 1979 this ship sank the contraband ship "Carina," coming from Panama full of weapons for the Colombian guerrillas. I did notice one remaining bullet perforation near the command cockpit. Around early evening we got to the modern and comfortable Navy base at Malaga. From there the ship left toward the open Pacific Ocean.



Malpelo Island. A look at the ship in background. the lower camp and operating sight in the middle, a small bird in the foreground and the terrain, all give us an idea of how things were on this DXpedition.

ON BOARD THE SHIP, Nov. 31

While traveling we kept in touch with our relatives, friends and dx-nets using a dipole and IC-765. Some of the dxpeditioners suffered seasickness and preferred to stay in bed.

ARRIVAL TO MALPELO ISLAND, Nov. 1

It was midnight, and very dark, when we got to the island. Most of the persons on board the ship were sleeping, but realized something was happening because of the sounds made by the anchor chain system and by movements and voices on board. All of us woke up early but it was still dark. I could only notice the figure of the island and a couple of lights, from a fishing boat, whose captain decided to protect his boat from the open ocean currents and winds, thus putting the island between his vessel and the elements.

THE ISLAND

At first light, the Island looked like a volcano. In fact it's origin is volcanic. One and a half mile long by half a mile wide and it's highest peak, "La Mona," is 1,300 feet above the ocean. It is hot and humid at day and very cold at nights. The sides of the Island are steep with no beaches around it. Scientists believe it was once ten times larger. Plenty of rocks can be seen around the island, which were separated by heavy winds and wave activity. The seabirds provide food to other species of lizards and crabs. There are no poisonous species and only some insects can be found. Light streams of water run inside the sponge interior of the rocks and can be seen exiting to the ocean. This is heavy water full of minerals of volcanic nature. It is not fresh water.

LANDING TO THE ISLAND Nov. 1

We were advised by the ships crew that we could not disembark, due to bad weather and waves of 5 meters. The group committed to go ahead with the operation anyway. Landing on the Island is very hazardous; since there are no beaches. Soldiers and visitors to the island have two ways to do this. First from the rubber (zodiac) boat one has to jump and get a 35 foot rope and wooden stairs which is extending in the air down to the ocean, from a floating iron type structure. It looks like a bridge to be used by the Navy to get provisions on the Island. This first way of landing is only for commandos, so we took the second way, which was also not easy. One had to jump to the

rock from the rubber boat at the exact moment when the wave was at it's highest, keeping in mind that falling down would result in broken bones, and bleeding cuts, that would alert the sharks. The rocks edges are like knife blades seaworn over time. Fortunately we had no serious accidents during the landing of the people.

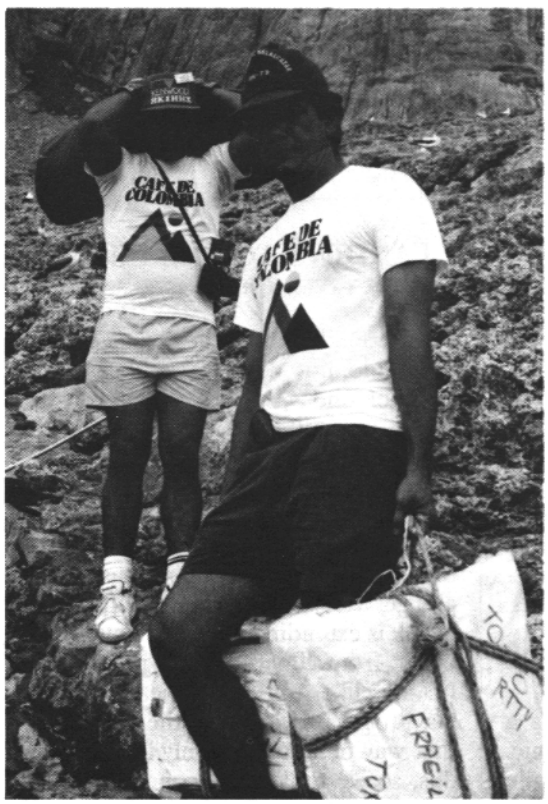
It took us all day and part of the night to get all the heavy freight on the rock. We were able to go up the hill, with our personal belongings, that night. After one hour, climbing the perpendicular rock, we found a level area which holds a meteorological and Navy installation. We decided to rest. It was midnight Thursday, November first. I noticed the shiny full moon which helped us to see our next step on the rocks. I still remember the singing of thousands of seabirds and the noise made by the crabs searching our provisions.

INSTALLING THE STATIONS, Nov. 2

We made several trips down the hill to get our equipment and the rest of our provisions. We could stay comfortably for a month with all the stuff we brought. We unpacked all the pieces and said goodbye to the ship; which returned to the mainland. Late in the afternoon we got everything settled. We prepared two phone stations to cover high and low bands, one CW station and my combined RTTY and phone station. The group director HK3BED, reminded us to start the operations at 00:00 UTC Nov. 3rd Saturday as published worldwide. By 23:00 Nov 2nd every station readied it's tent, operators, generator (full of gas), IC-765, Mosley TA-33 and dipoles for 40-80 and 160 meters., as well as snacks to share with crabs.

ON AIR Nov. 03 00:00 UTC

HK0TU came on air, contest style like. The sounds of dits and dats from the CW station to my right and the voices from two phone stations to my left, along with the RYRYRY of my RTTY station, made a beautiful combination of music. The seabirds and the wind were singing and it seemed to me like, as the pile ups got bigger, the higher were all the sounds. My first QSO was with AA5HP on 21,085. Later at 01:35 UTC I worked JR1CFD. We all had good propagation all night and could work Japan via long pass between 14:00 and 19:00 UTC. I worked another pacific RTTY station at 03:22, ZL3GO. We noticed late Nov. 3, Saturday, that only via longpass openings were we able work the JAs and since in the previous four dxpeditions to Malpelo only a few Pacific and USA west coast stations were worked it would be necessary to obtain the short path and avoid the 300 meter rocky wall before us. To do this, it would be necessary to climb to the top of one of the peaks where a station could be set up. It would be no easy task to get a Mosley TA-33, cabling, rig, generator, dipoles, gasoline, provisions, etc. to the top. The way up was a hard task for the group consisting of HK3DD, HK4HHG and Hk6BDX. Tibi, HK4HHG broke his knee during this operation. But, indeed, it was worth all the efforts made because from the first moment the station got on the air, all signals from Pacific were 599 plus. First QSO was with JA8FCB at 05:00 UTC Nov 4 on 40 meters. Then plenty of DX stations could be selected between rare ones like D68, TL, 530, VS6, 5T5, 7W, FR5, 5V, 3X1, 3C1 etc.



Peter, HK1HHX and Raul, HK1LDG head for the top.

Nov. 4, SUNDAY

By this day we had five stations on the air. We all kept working hard and filling our logs. Anyone willing to contact us had plenty of opportunities and many stations could work Malpelo on different bands.

SATELLITE ON AIR, Nov. 5

At dawn I enjoyed a beautiful sunrise and heard the first QSO made by Nacho, HK3CC, via Oscar 12 at 10:00 UTC with a W5 station. It was, as well as RTTY, the first time anybody had operated this mode from Malpelo. During the following days, more than 500 QSO's were made by HK3CC, HK1KXA, HK1HHX and HK4BHA on CW and/or phone. In fact Oscar 12 was controlled by the HK0TU pile ups.

It was now my chance to operate RTTY from the station up on the hill. I packed my Tono XL5000E, the SM220 and 13.8 DCV plant and climbed the perpendicular rocky wall. I plugged in my equipment and connected it to the IC-765 that was in a cave. I noticed the big difference operating from up on the hill hearing stations that we could not copy down below. My first QSO was with Gin, JA1ACB followed by several hundreds of JAs, W6, W9, W0. In one night I worked more stations (600) from up on top of the hill than in the previous two days of operation.

HAPPY BIRTHDAY, Nov.6

I did not sleep during the whole night. It was terribly cold, plenty of crabs climbing on my legs and taking my pencils and wristwatch to their caves. It was still dark at dawn when I heard a human voice saying "Buenos dias." "Good morning, Happy birthday, Raul." It was Arturo, HK3BED, waking me up and taking over at the mike. It was my chance to rest a couple of hours. Later I continued working RTTY and phone from up there and had 1,000 QSO's before the afternoon.

We did not need amplifiers to control any of the pileups except on 80 and 160 meters. We made special efforts to control the people; giving instructions and calling the stations to operate according to our procedures. Later I was informed it was a successful operation where nobody bothered.

Late in the afternoon, I came down to keep working USA and Europe on

Kantronics**KAM**

If you're looking for a flexible all-mode, if you're looking for a TNC to operate both HF and VHF digital modes, if you'd like one unit to operate RTTY, AMTOR, WEFAX, CW and Packet on HF, yet be keystroke switchable to VHF for packet, then you've found it, the Kantronics All Mode (KAM). Just ask a user!

It's the most flexible and evolutionary all-mode on the market! Since its first appearance in 1986, we've generated four major firmware upgrades, adding new capabilities each time. With release 3.0, in August of 1990, we added software carrier detect for squelch-free operation, reverse personal bulletin board forwarding, the new AMTOR 625, NAVTEX/AMTEX, a command to restore parameters and more!

And the KAM is tops in flexibility. The HF demodulator is user programmable, allowing keystroke selection of tone pairs. You can select any of the standard shifts (170, 425 or 850 Hertz - handy for MARS ops!) or you can set the MARK SPACE tones to any desired value within the unit's range, in one Hertz steps! You can program baud rate too, allowing for the operation or listening to off-rate baudot or other HF digital transmissions.

On CW we stand head-and-shoulders above the rest. You can program CW-filter bandwidth and center frequency to match receiver needs. If your HF rig doesn't have a CW filter, you can 'close it down' by decreasing the KAM's CW filter bandwidth! Better yet, you can match the KAM's CW demodulator filter to your particular receiver CW filter.

On packet you can operate on both HF and VHF simultaneously, enabling a host of new possible modes of operation. For example, you could have a QSO on HF packet while leaving your VHF channel available for mail or connect. Or, you could set your station up as a gateway, allowing other stations to digipeat from VHF to HF or vice-versa. Or, you could have an RTTY QSO while leaving your VHF packet mailbox active. And more, with firmware update 3.0, your personal packet mailbox (PBBS) is enabled to allow reverse forwarding of messages to a larger BBS, such as RLI. And on and on!

And the unit is PC or C-64 friendly: an internal jumper allows TTL or RS-232 serial port operation without the additional need for a TTL/RS-232 adaptor for the C-64 serial port, saving you money.

The three-manual set is outstanding too, consisting of installation, operation and commands. All are indexed and cross referenced to each other for quick access to related information. The Operation's Manual contains information for beginners too.

Specs: size 1-3/4" by 6" by 9", weight 2-1/2 lbs, power requirements nominally 12 VDC at 300 ma. Input sensitivity 20 mvpp (FM), 100 mvpp (AM). Audio drive jumper selectable from 100 mv to 1.6 vpp.

Options: a 2400 baud QPSK modem for VHF/UHF operation, an MSK modem for advanced HF use, and a battery backup or SmartWatch for preserving mailbox contents/time during a power interruption.

Modes: CW, RTTY, ASCII, ARQ, FEC, WEFAX, AMTOR-625, NAVTEX/AMTEX and PACKET.

So there you have it, the flexible and evolutionary all-mode. For a detailed specification sheet contact Kantronics. The KAM, the all-mode that evolves with the state-of-the-art.

Kantronics 1202 E. 23rd St., Lawrence, KS 66046, 913.842.7745 TELCO BBS 913.842.4678

phone. Special efforts for Japan and Western USA were made by all of us, because only a few stations had QSOs in past dxpeditions to Malpelo in 1961-1969-1977 and 1983.

MORE DX, Nov. 7

We were informed that the ship was on the way to the Island to pick us up, so we made great efforts to keep up continuous operation. The operators started working every two hours, in order to get the maximum operating performance. At night using our amplifiers we worked plenty of stations both CW and phone in the low bands of 80 and 160 meters.

LAST OF OPERATION, Nov. 8

At daybreak we were operating low bands. 40 meters on top station and 80 and 160 meters at the base stations. I pushed my IC-765 14 MHZ around 09:00 UTC and started working and had a short chat with V29A, around 14,165 I found W2MIG and KP2A. Many other QSO's were made very quickly, since we were closing operation at 11:00 UTC. I closed my station with Bill, VS6CT, from Hong Kong, a QSO we both still like to remember. Beto, our QSL Manager closed his station on 7,085 working JA1AFR at the top of hill in the rocky shack. Peter,HK1HHX, closed his with HK1LDA in a CW QSO and Richard HK4BHA on 3,795 MHZ closed his station with JA2KUD. The VHF satellite antenna was used to contact the ship captain. At 11:00 UTC contest time we all said, IT'S OVER.

After a meeting, and while waiting for the operators to get together around the meteorological station, we had breakfast and counted the log books. More than 40,000 QSO's made. Some 12,000 in CW, 1,200 in RTTY, 700 Satellite and the balance phone QSO's. Later I heard, that all main DX nets and the ARRL bulletin said the HK0TU, Malpelo Dxpedition had been a successful one.

DISMOUNT OF STATIONS

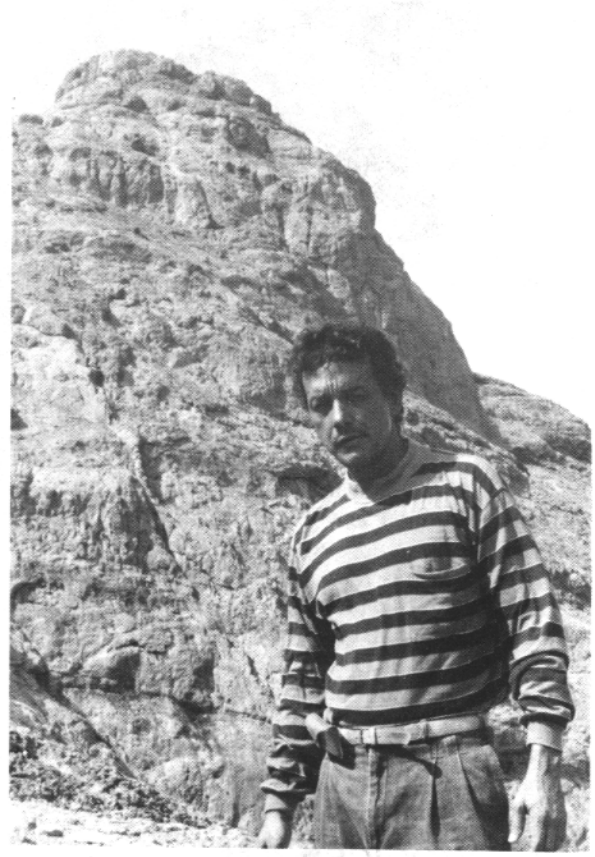
The ship was couple of miles from the Island waiting for us. We packed all the equipment and started to carry the freight down to the iron bridge. From there we had to use a rope and a pulley to get the metal and plastic cans down to the rubber (zodiac) boats in a hard operation. It took us all afternoon to make several trips to the ship. It came difficult when we had to put a harness around our armpits and hang from the iron bridge to get to the boat without getting wet or bashed against the rocks. Thank God, the Navy sailors were experts and we all reached the ship safely by late evening. In fact, it was already dark when the last boat arrived at the ship.

BACK TO CONTINENT, Nov. 10

It took the ship 40 hours to get to the seaport of Buena Ventura, where a large group of hams with music and pancharts received us. They were people from our Cali City League Association. That night we were invited to a delicious dinner and I had my favorite cold beer which I had missed for a couple of weeks.

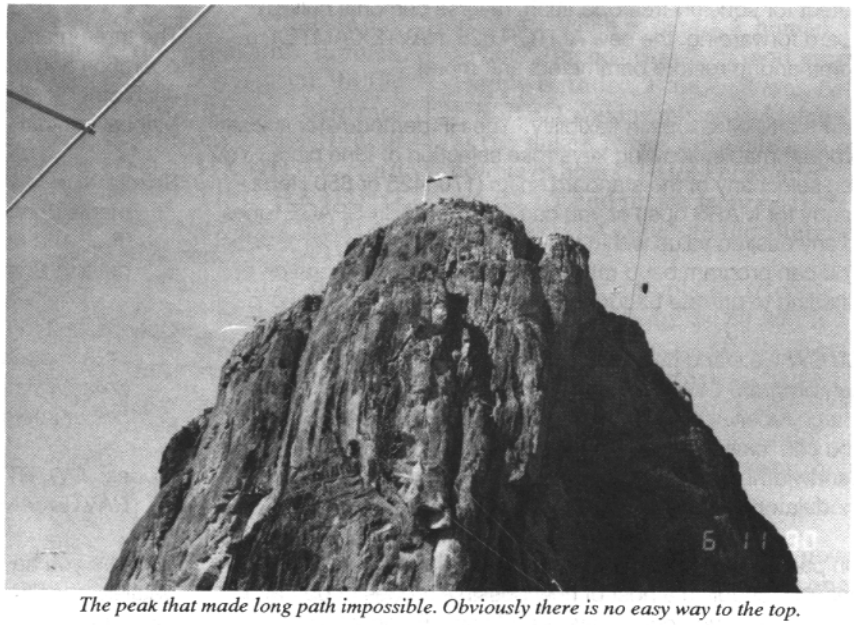
There is no space here for the great number of hams and associations that made our dxpedition possible. They are our friends and we really appreciated their kind actions.

de Raul, HK1LDG



Raul, HK1LDG, with top station location in background.

ED: ***Raul Gonzales, HK1LDG, is Director member of the Colombian Radio Amateur League and Member of the Malpelo 90, HK0TU, DXpedition. You will also find Raul active in RTTY Contests, where he has some wins to his credit. RTTY can be fun and Raul is an excellent example of how to get the most from this popular Digital mode. The next time you hear Raul on the air, give him a shout, you'll find a very freindly Ham with whom to share a QSO.***



The peak that made long path impossible. Obviously there is no easy way to the top.

MSO

Dick Uhrmacher, K9VKH
212 48th St. Rapid City, SD 57702

Hi Gang! I hope that everyone survived the Holiday Season, and that Santa was kind to all of you. I've been listening around the bands, hoping to hear lots of new Kenwood TS-950's on the digital modes, but I fear that Santa was on the conservative side this year! Is it possible that 1991 is really here already? Is it possible that the Dayton HAMVENTION is just around the corner again? Boy, how time flies when you are having fun!

INTENTIONAL INTERFERENCE

Some years back, we were plagued with some intentional interference on the National Autostart Frequency, and this subject has reared its ugly head again. Although, as of this date (December 1990), I have not personally witnessed this interference, I do want to touch upon a few salient facts concerning this childish activity.

First of all, one only needs to read the "Happenings" column in "QST" for a short time to determine that the Federal Communications Commission (FCC) does not take lightly to the subject of intentional interference. In fact, in a climate where the FCC does little else in policing the Amateur bands, they are very aggressive in monitoring, identifying and prosecuting those who intentionally interfere with established communications. To intentionally interfere means that one willfully causes interference to established Amateur communications. We routinely see forms of un-intentional interference, which we all attempt to prevent. But it's a rare thing to find someone intentionally interfering with another stations signals, and from my experience in the past, not only highly frustrating, but easily determined.

My experience with those who intentionally interfere indicates that they are usually effected by an anti-social psychosis. They crave attention, feel neglected by the masses, and in a futile and paranoid attempt to draw attention to themselves, cause this intentional interference, knowing that their identity is usually well known. These persons derive pleasure by making the rest of us squirm. They derive a sense of accomplishment when we blow our cool and lash out at them in an attempt to settle the score.

There are two things that each of us should do in an attempt to combat this type of interference. First and foremost, do not engage in a sabre rattling, name calling, frustrating and threatening conversation with whoever is interfering with you! That's exactly what they want. No QSO or MSO use is so important that you can't wait a few minutes until the interfering station tires of his childish tactics, and departs the scene. Secondly, do not hesitate to contact the FCC! It's best that you contact them in writing, providing facts on the frequencies involved, beam headings, callsigns, specific mannerisms, etc. I know of cases where the FCC Monitoring Stations have contacted stations who were being interfered with, and solicited further information. Don't hesitate to lay it on the line, but keep a good log of events so that you know what you are talking about!

DX INTERFERENCE!

I think that all DX contacts and QSO's should be allowed only on 10 and 18 MHz. All of the rest of the Amateur bands should be reserved for CBMS (computer based mailbox systems), MSO's and BBS's! Now isn't that a pretty radical statement? (I think I felt the Earth shudder just a bit, probably emanating from the Guatemala City area!) Well, believe it or not, I happen to be reading one of the more famous "DX NEWS" files as it came across my monitor, and in it was a statement that went something like, "all mailboxes and BBS's should be allowed only on 10 and 18 MHz." Now I wonder if the "down under" author of that statement gets any more enjoyment out of chasing DX, than I do in running my MSO? Is it possible that just once, a DX enthusiast has interfered with an automated service, however unintentional? We have enough problems with available spectrum without such radical statements. If what I read in "QST" lately about DX'ers, DXpeditions and the on-the-air conduct of some individuals involved in the DX scene is correct, then I might suggest that those who live in glass houses should not throw stones! Amen.

N1API, MSO

Al Kaiser, N1API, of Meriden, Connecticut, is a long- time MSO SYSOP, and provides excellent service on the National Autostart Frequency. As can be seen from the accompanying photograph, Al has a very nicely laid out station, and his fine RTTY signal proves it out. Al uses the venerable work-horse of the MSO business, the HAL MPT3100ASR, ST6000 Deluxe Demodulator, and DSK3100 Disk Drive system. His transceiver is the Kenwood TS-940S/AT, running into a new beam and tower combination, that really provides fine coverage. Al also is very active in the Ten-X Club, providing some assistance in managing this popular mode on 10 Meters. Give Al's MSO a shot, and you'll enjoy meeting a fine gentleman!

WHERE TO FIND INTERESTING, UP-TO-DATE AND FACTUAL DIGITAL INFORMATION

Yep, you guessed it! "The RTTY Journal" is the only publication I know of that fits that description. I see several of the other Ham publications have a "digital column", but most of those publications are diluted with information and articles on everything from basket weaving to sail boat making, which loses my interest in a hurry. For those of us who are mainly interested in digital modes, The RTTY Journal not only provides some interesting technical insights to the various digital techniques, but it also provides current DX, Packet Radio, AMTOR/APLINK, and contesting information. Where better to advertise your digital equipment for sale, or to look for digital equipment to buy? For about half the price of other related magazines, you get the real thing! Pass the word!

MSO RAMBLINGS

If you're interested in using the new HY-GAIN DX-88 vertical antenna on RTTY, it might be wise to visit with Larry, KA0JRQ, before running high power with this antenna. He hopes to have his HY-GAIN HY-TOWER back in operation as soon as he can dig a hole in that frozen Iowa soil. Larry's MSO can be found on the National Autostart Frequency.

Jerry Trichter, WA1IUF, remains about the same. His medical condition hasn't improved much in the past months, but his XYL and daughters report that he very much enjoys hearing from his friends. Drop Jerry a line at the Branford Hills Health Care Center, 186 Alps, Branford, CT., 06405

Ernie Johnson, W6ZRR, San Luis Obispo, CA, is recovering nicely from some medical problems. His MSO is regularly up and running on the National Autostart Frequency.

That's it for this month Gang. I hope that 1991 is a healthy, happy and prosperous year for all of you. See you on the MSO's!

de **Dick, K0VKH** ■

PACKET

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

CONTINUATION

In last month's article, I discussed the Kantronics Data Engine DE9600 modem and the radio receiver types that are needed. Here is a suggestion for people to try if they have a rig that has a ratio detector in the receiver. In the December, 1989 issue of the late "Ham Radio" magazine, there was an article written by Glen Elmore, N6GN, and Kevin Rowett, N6RCE. The article described a data link using microwaves and the attendant electronics. In the receiver section, the main IC used is the Motorola MC13055 FSK receiver chip. The schematic supplied in the article has enough information presented that it could be modified for use as a 10.7 MHz FSK detector. If there are any questions concerning the required parts changes, I am sure that the answers can be found in the application note for the chip from Motorola.

I still have not had a chance to get it on the air at 9600 baud here, due to no frequency assigned. I am planning to do some signal to noise testing of the 9600 baud modem and I will be getting the results of that testing to you next month.

NEW TOYS

Undoubtedly, almost all of you out there received or treated yourself to a new toy or toys. That may have been a computer, radio, TNC, antenna, etc. Before even thinking of hooking up the new equipment for the first time, READ THE MANUAL! Just by some stroke of divine providence, what you might think is PTT could be 110 V A.C. and when you ground it..... You get the picture, I hope.

If you bought a TNC and are now wondering how to hook it up to your old, trusty 2 Meter radio, first read the manual for the radio and the TNC. There should be enough information therein to enable you to hook up the TNC to the radio and get things working.

If you can't find the information, or you are not sure of something, play it safe ... call the factory. Just about all of the manufacturers, to whom I have talked, are willing to help the new equipment owner with a problem. Spending a dollar or two on a phone call, and getting it right the first time, beats spending more money getting either the radio or the TNC fixed because of an improper hookup.

Okay, by now you have the TNC hooked up to the computer and radio and are ready to go. Before turning on the whole system, go over the wiring again and make sure that all connections are correct and solid, with the wires running to their proper places. Power up the computer and load the communications software according to the directions (Did you read them first?) Then bring up the TNC. We have no need for the radio to be listening at this time. Just about all TNC's now have an autobaud routine that comes up to get the communications port speed correct between the computer and the TNC. Once that is established, then you should see the "sign on" from the TNC, on the screen. Hit the "enter" key a couple of times, if you get a couple of "CMD" lines, all is well so far. Now you have to do some presetting of the parameters of the TNC to make it work right.

First you must set your call. Just type in "MY" followed by a space and your amateur call and hit "enter." That just put your call into the TNC and gave the unit a unique identity. Remember, on some TNCs, you have to "perm" the configuration information. Now, turn on the radio and set it to a Packet channel. Set the volume at about 1/3 and the squelch so the radio is just quieted with no activity on the channel. If all is fine, you should start seeing packets displayed on the screen as they are received and decoded.

Let me point out that some TNC's do not need the audio squelched. One of them is the DE1200 board from Kantronics that fits inside the Data Engine. This radio can be fed unsquelched audio all day long and it would not matter. It just looks for the proper tones. This type of TNC therefore allows for faster response on the channel and better throughput.

TCP/IP verus PACKET

Lately, there has been some bantering over Packet and TCP/IP. I think people are getting their apples and oranges mixed up by assuming and not looking at what is actually happening. But, let me explain.

Packet Radio, as we know it (AX.25), was developed from the X.25 network communications standard. The way it is presently implemented in the Amateur world represents a small change from the original standard. The basic operation of Packet requires two stations to be connected logically, followed by handshaking requests between the two stations, to make sure that the connection exists and to verify the receipt of transmitted traffic.

This whole process requires that some information be transmitted to a destination station while the sending station receives control and routing information.

Whenever a station attempts to connect to another station, using AX.25, the sending station will send out connect requests until one of two things occurs: 1) The sending station receives a connect acknowledgment from the destination station, or, 2) The sending station hits the retry limit and cancels the connect, (usually after ten tries).

Let's say that the two stations have made a connection and there is no traffic passed between the stations for some time. The TNC will send out a poll to see if the other station is still present and connected. If the other station is there, it will send out a response to the poll.

When the sending station is trying to get data through a busy channel, it will keep banging away at it every few seconds until it exceeds the retry limit and disconnects, or, the destination station "acks" the sending station's transmission. This very process can cause channel congestion, and if enough stations are doing it at the same time, the channel dies.

That covers the basics of AX.25 operation. Now to discuss how it is done using TCP/IP interfacing.

Whenever a user is using TCP/IP over Packet Radio, AX.25 is still being used. All of the information is still there, as in a regular packet transmission, but with a few differences. The transmission medium is AX.25, with the callsigns and routing still intact in the packet, the difference is, instead of just having typed data in the information field, you have the TCP/IP control information and any data to be sent.

Whereas in the regular AX.25 mode, as discussed above, most transmissions are done in a connected state, the TCP/IP operation uses the unconnected state and just uses AX.25 as a transport medium across the airwaves.

Let's now describe how a connect sequence is done using TCP/IP. The sending station sends out a broadcast saying that it wants to connect to a destination station. This is the same operation as in regular AX.25 operation. Let's say that the destination station is not on the air. The sending station will not hear a reply, so it sends out another connect request after waiting a period of time. It will wait double the last time if it does not hear the station before sending out another connect request. The sending station will keep doubling the delay between connect requests until it hits a limit. As an example, the first time the station waits 5 seconds, the second time 10 seconds, the third time 20 seconds, the fourth time 40 seconds, etc. The sending station will keep this going until it either makes contact with the station or the operator cancels the connect. It is quite possible for the station to wait 45 minutes between sending connect requests. This is what is called "back-off." This routine allows for more users on the channel than with regular AX.25 operation. This backoff can even be applied when the stations are connected to each other.

The connection that I mentioned above is not a connection in the same sense as in a straight AX.25 connect. The connection is a logical one maintained by the computers involved with the connection. There really is no need to keep sending out Polls to find out if the other station is there. As an example, I start a file transfer at 6 A.M. and leave for work. The transfer finishes at 6:30 A.M. My computer will not stay there and send polls to the other station every 5 minutes like a regular AX.25 station could. My machine would just sit there and be quiet except for a broadcast every 10 minutes of my node table (one entry, this station). When I come back home, I can go to the computer and see if the transfer is done. It usually is and I can either request another one or quit the session. Either way, because there has been no activity between the two stations since the end of the file transfer, my station would send out a ping (poll) to make sure that the other station did not disappear. If there is no response, then I am informed that the connection is broken. If there is a response, the session carries on like before. The nice thing here is that my station and the other station did not pollute the airwaves with polls every "x" minutes.

Another item that needs to be addressed is the complaint that IP traffic ties up the channel too rapidly. I believe that the complaint is based on the size of a transmitted packet. Most regular AX.25 users have a packet data length averaging about 80 characters. An IP station will usually send about 216 characters in data length per packet. Of course, this takes a little longer but is more efficient because, in regular AX.25 operation, to send 216 characters at 80 characters per packet, it would take three transmissions to do so. Now let's break down what really happened on the channel. The IP sending station sends one packet consisting of the AX.25 addressing information and the data. The IP receiving station sends back an "ack" consisting of the AX.25 routing information and the ack information. The regular AX.25 system would send a packet consisting of the AX.25 routing information and the data. The receiving station would send back an "ack" consisting of the AX.25 routing information and the "ack" code. This is repeated two more times. This is wasted time by the sender in sending two AX.25 routing sections, and, by the receiving station, two AX.25 "acks."

Both methods use the AX.25 method. It is how they use it that makes the difference. What will make TCP/IP really shine is when 9600 is in common use. The reason is that TCP/IP was designed to be used on megabit speed links, and 1200 baud is a little too slow for efficiency. There are other aspects to the various modes of operation that TCP/IP offers that I did not go into. But, if you want to dig into this mode, there are programs written by KA9Q, PA0GRI, PE1CHL, and G1EMM floating around for PC compatible systems. Try one out and see. You may just like it.

NEXT MONTH

It looks like I will be testing the 9600 equipment here on simplex. The amateur community involved here with the project is ready for testing. So, we will see how well the Kantronics system works. Until then, 73. de **Richard, N6NKO** ■

DX NEWS

John Troost,TG9VT
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As I sit here biting my nails, waiting for the YA033 to appear on any mode, I reflect that propagation in December really has not been too bad. Yes, 20 Meters closed up at 9 P.M. local time, but in the mornings, from 6 A.M. on, 10 Meters was wide open and had some real nice DX to show. Guess that with 10 being that wide open, we are still a long way from a real downturn in the Solar Cycle.

Also, Christmas has apparently been real good to a lot of guys, for in the last few days of the month I found more new RTTYers than ever before. I must have given 10 people their first RTTY QSO, and it makes me happy to see more newcomers use this Mode. One evening on 40 meters, I was able to do an All Time First RTTY for 3 guys in half an hour. Congratulations fellows, you have come to the finest mode!

Maybe, with all these newcomers, there is still a chance that our Band Segments may be revived, rather than full of ever re-trying HF Packet. Please go back to VHF guys, where you can do some good with the present protocol. Some guys never seem to learn, to the detriment of the RTTY users. And, just recently, this problem has been aggravated by the decision of the Canadian Regulators to create absolute chaos by permitting Canadian Amateurs to use any Mode of Emission in the 20 M RTTY segment. I guess the intention is to convert 20 Meters into the bedlam now reigning on 40 Meters.

DECEMBER HAPPENINGS

The only expeditions this month were the one to **CAMBODIA, KAMPUCHEA** that is now called, **XU1DK**, by JG1RVN, Toru San. Unfortunately the propagation was not with him, so the East Coast U.S. was pretty well left out. Thank you for Country no. 281, Toru San. And the one by Bob Winters to **KURE ISLAND, NH7/KD7P**, which was an excellent example of how a good multi-mode, single operator expedition is to be handled. Congratulations Bob!

Also, **3B9FR**, Robert, from **RODRIGUES ISLAND,** has been more active this month, principally on 15 Meters, but I have not been skillful enough to work him. Maybe with a DX Packet Cluster, but they are kind of hard to access from TG9 Land. Boy, DXing sure has changed! (For better or worse.)

The principal goodies spotted this month include UC20CJ, UD6DM, UI9ABV, UJ8JCQ, RH8AX, UL7PCZ, UM8NC, UO5OC, UP1ML, LY1BZB, NH7/KD7P, UQ2HO, UW0LZ, TF3EJ, V51P, 5Z4BI, 9X5LJ, 3X1SG, OX3EW, VK9NS, 9Q5BG, 9Q5UN, J6LSC, TR8JH, Z21EZ, 6W6JX, FW1FM, V31AR, FR5ZD, TY1PS, ZS9Z/ZS1, VR6WH, ZB2JB, ZD8BOB, ZD9VB, ZD9CO, C56/6W6JX, TU2BB, VP8BFH, BV2B, 9J2BO, 5V7DP, 8P6KW, XU1DK, V85GA, BZ4RC, A45Z, V73BN, JX7DFA, VU2SJV, ZS9Z, VP2EE, ZK1AP, 9M6/JH1ROJ, XX9AF, 7Z1AB, A41JW, HV3SJ, A22BW, KP2N, J39BS, YI1BGD, YS/WD4IFN, 4Z80TA, 8R1RPN plus many more: a nice crop, and going a long way towards satisfying your DXCC requirements. All it takes is giving up working, eating and sleeping and then staying glued to your radio gear 24 hours per day, propagation or not.

I can well remember some years ago, in the middle of the night, on a dead band, when a Chagos, VQ9, station all of a sudden appeared with a 20 over signal. All it takes is to tell your family to go take a long vacation. (But you have to finance it.)

And F2JD (ex CE0ZZZ) tells me that, of the more than 10,000 QSOs he did from **JUAN FERNANDEZ**, 377 were on RTTY, versus 870 on Satellite. QSLs in February.

DO AS I SAY, DON'T DO AS I DO

In the Jan. '91 issue of QST, the ARRL outlines the "Gentlemen's Agreement" of Frequency use. It also refers to the September '87 issue of QST, outlining the Packet recommendations. So, if Packet is recommended from 14,102.3 to 14,108.3, how come the ARRL is sponsoring the STA boys, suggesting they move down and interfere with the ARRL recommended RTTY segments below 14,100? This makes WA4JQS very mad (me too). Plus, Tony thinks that it would be wise to re-locate the National Autostart Frequency to 14,098, to provide a delineator between Packet and RTTY.

QST says they recommend that 7038.3 and 7091.3 be set aside for Packet. Then, how come the recommended RTTY segment from, 7,080 to 7,100 is filled wall to wall with Packet, without the slightest objection from the ARRL and the FCC. Instead they encourage more STA operations. In fact, if you listen to the bedlam on 40 and the incursions on 20, you would think that there are about 500 STA stations all trying at the same time. So the ARRL's "Considerate Operator's Guide," as published in the January QST, says that a "Considerate Operator" runs RTTY from 14,070 to 14.099.5 and this "guide" refers to the September '87 issue for packet frequencies: and there it says: with a center frequency of 14,102.3 and 14,108.3. Well, I got news for you: the average Packet Operator has no idea what frequency he is on. He uses AFSK, in USB or LSB and he thinks that the frequency shown on the dial is the Center Frequency. Again, I have got news for you: it is not, but I leave it up to Richard, N6NKO, to explain to you how this works, that it is his department.

So here it appears the ARRL has two faces, the nice face, saying what considerate gentlemen should do and the "other" face, that tells those boys to put their STA operations in the middle of the "Gentlemen's Ageeement" RTTY segment. Guess it is OK. After all, a horse has two ends. Humm, what is the other end called?? You guessed it!

CUL

This Column turned out a bit short this month. I have been under the WX a bit lately and will go to Boston for a Checkup at Massachusetts General Hospital in late January. So what about you guys and

OVER 45,000 PK-232s SOLD!

The AEA PK-232 multi-mode data controller remains the most widely used radio data controller **anywhere.** More hams own the PK-232 than *any other* radio data controller. And AEA's hard-earned reputation for quality and service keeps them coming back. The '232 gained its popularity with features like these:

STATE-OF-THE-ART TECHNOLOGY.

Since its introduction in 1986, the PK-232 has been updated **six times** to continue bringing you the breakthroughs. Six updates in four years! And even the very first PK-232 is upgradable to the latest model, with a relatively inexpensive user-installed kit. If you want a state-of-the-art multimode controller, you want the PK-232 MBX.

SUPERIOR FILTERING

The 8-pole Chebyshev filter in the PK-232 was designed from the ground up to work on HF **and** VHF. We didn't just add some firmware to a Packet modem to create our multi-mode. Our modem was **proven** superior by tests in Packet Radio Magazine over *all the others tested.* Read the fine print! You just can't beat the PK-232 for performance, quality and integrity. 45,000 PK-232 owners can't be wrong!

INNOVATION

The PK-232 has been the one to follow for technology advances. It was the *first* radio data controller with weather-fax, the *first* with Host mode, the *first* with NAVTEX, the *first* with Signal Identification, the *first* with TDM, the *first* with AMTOR v.625, the *first* with a WHYNOT command, etc, etc. AEA has always strived to "Bring You The Breakthrough," and while others have tried to imitate, only one can be the best.

The only data controller **designed from the ground up** to be a true multi-mode, the PK-232's tuning and status indicators work in all modes, not just packet. Make sure the multi-mode you buy isn't just a converted Packet TNC. There's only one number 1!

HOST MODE

Many superior programs have been written specifically for the PK-232 in Host mode language: **NEW** PC-Pakratt II for IBMs and compatibles, updated MacRATT for Apple Macintosh, and ComPakratt for Commodore C-64 and C-128 computers.

ALL DIGITAL OPERATING MODES.

The PK-232 MBX includes all authorized amateur digital modes available today...Packet, Baudot, ASCII, AMTOR/SITOR (including the **new** 625 recommendation) and Morse code, as well as WEFAX (receive and transmit). Other features include the PakMail 18K byte maildrop system with automatic normal and **reverse** forwarding, NAVTEX reception, KISS protocol support, binary file transfers and more. Also included is the TDM (Time Division Multiplex) mode for SWLing that few others have. No other multi-mode has all these features.

SIGNAL ANALYSIS.

The first multi-mode to offer SIAM (Signal Identification and Acquisition Mode) was, of course, the PK-232MBX. Indispensible to SWLers, SIAM automatically identifies Baudot, ASCII, AMTOR/SITOR (ARQ and FEC) and TDM signals, then measures baud rate and polarity. Once the PK-232MBX is "locked on" to the signal, a simple "OK" command switches to the recognized mode and starts the data display. You're even ready to transmit in that mode if applicable.
The PK-232MBX makes SWLing easy and fun, not difficult and frustrating.

REPUTATION

The PK-232MBX has helped AEA establish its hard-earned reputation for producing high quality amateur radio products. Anyone can **say** they have a good reputation, so it pays to ask around. Listen on the HF bands and see which multi-mode is getting *used*. You owe it to yourself to get the best possible value for your money. Don't settle for less!

Watch for the DSP-1232 and 2232 coming soon!

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gals?? Well, the world renown DXer, **Jules, W2JGR,** has gracefully offered to do the DX Column for the RTTY Journal for February, so there will be no interruption of the reports on DX goodies showered upon you. Thank you Jules! I sure hope to be back with you in March.

During the same period, DX1, VK2SG will be on vacation for 3 weeks. Meanwhile the weekly **RTTY DX NOTES**, normally prepared by him, will be written by I5FLN, Luciano of Firenze, Italy and will be distributed by 0D5NG. Somehow, they will find their way to my APLINK Box and will be available as usual, but possibly a little late. Luciano's notes will be first class, as he is No. 2 World Wide in DXCC count.

In February, the RTTY Journal will also present you with a SURVEY FORM for the **MOST WANTED COUNTRIES ON RTTY**. Last year's survey has helped us convince some of the expeditions to carry RTTY gear to the Desired Rare Locations. The survey last year was far from perfect but I learned something from it. This year's survey form will be clearer and I hope that many of you, if not all, will spend five minutes and 25 cents postage to return it to me, filled out. That way we will have more ammunition to convince the DXxpeditions that RTTY is truly a viable mode. Thank you for your help.

Thank all of you who spoon-fed me information during the month, to make it possible to have some information to share with you, including, among others VK2SG, OD5NG, W2JGR, W6PQS, I5FLN, K4FJ, WA4JQS, PS7KM, F2JD, NT3B, OH2BH, and VU2JX. I don't dream these things up myself, so I am most grateful for the help. In fact, without help, there would be no DX Column.

73/88 and sure hope to be with you in March to give you the best from the World of DX in radio's finest Mode.

God Bless you all and go get that DX out there, it is just waiting for you!

de **John, TG9VT**, on top of the World with a 4 element quad.

DX COMINGS

Though he has not been seen in this part of the world, ROMEO, YA0RR, is active. I hope that by the time this issue of the JOURNAL reaches you, all of us will have worked him. As of this writing, they still have trouble raising the antennas they have brought along. Since AFGHANISTAN, and particularly Kabul, is still a war zone, any big, new structures in the air might raise unwelcome attention. Hence, they tried dipoles, with little success. But late news tells me that Romeo and Valery will not do without the beams, so they have decided to move their 200 KG of gear for a 2-3 day trip by military road transport to Mazar-E Sharif, near the USSR border, north of Kabul, where things will be safer, we hope. Pray! Those guys have GUTS.

MALYI VYOTSKIJ ISLAND is still on schedule for March/April and possible again for late summer '91. Martti Laine, OH2BH, is now the proud owner of a TONO 5000E (courtesy of JA1ACB), which you may also see active from some of the other exotic spots Martti visits in his well travelled life. Still no word as to who the RTTY operator will be, since it may turn out that only USSR or Finnish operators may be able to partake in this expedition.

Robert, 3B9FR, RODRIQUES ISLAND, has been active with is IRDXA gear several times in December, watch for him around 21,090 at around 1900Z, unless you are lucky enough, that you do not have to work him.

BANGLADESH, S2 is still expected to be on sched late February, with K5VT operating IRDXA gear as S2VT. Also Jim Smith, VK9NS, tells me that he is waiting to clear the last hurdle of red tape to go to S2 on a moments notice. He has solved the problem of RTTY from there, by taking two RTTY machines with him, so that the Authorities can monitor him, while he works RTTY and CW; Good going Jim. But all this is still a "Cross your Toes" affair.

P29BT from PAPUA NEW GUINEA was on the air shortly with IRDXA gear, but blew his power supply. Then he went to the U.S. for Christmas and is now on the way back there with a new TS- 440. He will be there for two years, so no rush to work him. He will not go away for a while.

NOTE; How often do you see that New Ones are operating with IRDXA Gear? Many of them. If you wish to help, send your contributions to: THE INTERNATIONAL RTTY DX ASSOCIATION, 356 Hillcrest Street, El Segundo CA. 90245, U.S.A. Thus you will help, getting some of the Needed Ones on the air. You get no special treatment, only Brownie Points. Besides the firm happenings listed here, IRDXA is currently also working on equipping stations in CE0/X, FH, and VK9/X with RTTY gear.

The IRDXA gear for 7Q7LA, MALAWI, is now being prepared for shipment. Soon Malawi should be up on RTTY on a regular basis.

Ron Wright, ZLIAMO will be off on another one of his famous trips in March '91. This time KERMADEC ISLAND, ZL8. As this one is on the most wanted list for RTTY, Jim, N2HOS has been so kind as to furnish Ron with a portable Computer, while IRDXA has shipped him a brand new KAM for this operation.

Chilenian operators are trying to equip John, CE0X, SAN FELIX ISLANDS with RTTY gear. May we all hope that this works out. John will be on San Felix for some time.

Karl, PS7KM, informs us that a major effort by the NATAL DX GROUP is scheduled for the first week of May '91. The group plans to go to ST. PETER AND ST. PAUL'S ROCKS for a Major Multi-op All Mode Operation. They have arranged for a Dutch Yacht, 15 Meter long, to take them 1100 Km East of Brazil and as of this writing, I am advised that JHIAJT, Zorro, will most likely be the RTTY Operator. As the trip is estimated at $5,000, and each of the 6 operators is contributing $500, there is still a deficit of about $2000. Contributions are much appreciated to Natal DX Group, POB 597, 59022 Natal, RN, Brasil.

And here is a bit that has more or less transcended the rumor state: a well known RTTY Expeditioner is planning for a trip to two rare Caribbean Islands, KP1, NAVASSA ISLAND and KP5, DESECHEO. As this operator is very shy, he does not want any details of the trip, nor his call, to be published yet. (In reality he is protecting himself, should the trip fall through.) Stay tuned.

It seems that any prospective Expeditions to ALBANIA have been postponed to mid year at the request of the Prime Minister. It seems that the climate is not quite right just now to receive foreign visitors, though it seems that various groups have obtained visas and licenses.

A61AD has all the equipment to be active on RTTY from the UNITED ARAB EMIRATES. However he has had trouble getting the gear going. Wish him luck (and yourself), but some U.S. Ham is expected to visit him shortly and will get him straightened out.

And finally, YS/WD41FN is now active on RTTY from SAN SALVADOR and expects to be there for a three year period.

GL de **John, TG9VT**

SOFTWARE

Jay Townsend, WS7I
P.O. BOX 644
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Greetings from the cold Pacific Northwest. Nothing in the mail bag this month to share, but did receive version II of the PakRatt program from A.E.A. I have it installed and working and it holds great promise!

PK-232 REVIEW (cont.)

Using the PK-232 is a great adventure and so I fired it up on 14.096.3 using the ICOM 751 in FSK mode. No wonder there is such a constant roar of signals in the high end of the 20 meter band.

There were about 20 stations on this one frequency and I monitored a bunch for a couple of hours. The PK-232 is all that has been said about it, a superior HF Packet device. The filters are quite nice and reception is clean and crisp. Packet contacts up above 14.100 were made and it performed without flaw. HF packet is slow!

The PakRatt (still on version I) is easy to use and allows you to keep on copying while changing things. Finally, I have figured out what all the charm and flexibility of the multi-function digital units give the user in software control. Since the PK-232 has a micro processor and the user's micro is under separate software control, many nice things are quite easily done by the programmer.

Using the PK-232, running AMTOR (still the old PakRatt I program), I concluded that it is a little less effective than the HAL communications PCI-3000. Using a 500 Hz filter on the ICOM 751A, the PK-232 prefers wider side bands for good copy. It copies in monitor mode much better using the 2.3 Khz filter and a little pass band adjustment. According to my calculations (Help Cole!), the AMTOR signal should at 100 baud, 170 Hz shift fit into a 500 Hz passband, but it seems to like being a little wider. The HAL unit didn't seem to have this problem. Now this might be a timing or algorithm problem or maybe, since most of the PK-232 folks are running AFSK and 200 Hz shift they might be just wide. I am not sure.

Which reminds me of a discussion I had on Air Force MARS about people running 200 Hz shift (standard is 170 Hz.) Lots of PK-232's are being used on AF MARS. Every TU I have ever used will copy RTTY with either 200 Hz or 170 Hz shift. The difference at 45 baud is very slight. My ICOM 751 is set before every contest to 170 Hz shift and usually, when measured before calibrating, varies from 165 to 195 Hz. With all the jiggling and moving of this rig, as I change things around or take it off to a DX location to do contests, this is understandable.

ASCII mode on the PK-232.

Hmmm, not sure why the manufactures of multi-function digital units even bother with this mode. I went up on 2 meters with a friend of mine who lives in Idaho (just about 20 miles east) and tried it. ASCII mode is, in my opinion, worthless. I told you last month I had opinions! Now I can see running Baudot at 1200 Baud (Nah, I really can't.)

I use only 60, 66, and 100 WPM Baudot, Packet at 300, 1200, 2400 (looking forward to more UHF speed before long) and AMTOR at 100 (seems some say 110?) Most of these other speeds are just there because, like all things, speed of digital modes can change very quickly. I just recently got a 14.4 KBaud HST phone modem. Boy, downloads at 9600 and above are quick !

Since the PakRatt II software has arrived I want to focus the rest of this month's discussion of its basic features. Next month focus will be on the software program that I have been waiting to review for a long time . . . . ARIES-II.

The box arrived! Vaporwave no longer, the A.E.A. newest version of PakRatt II has also arrived. It is available as an update to current users of PakRatt. The first most noticeable difference is that it no longer uses an async module, but is a single program with the author's name attached. Two immediate things hit me about the new PakRatt II, first it has mouse support (I hate mice, another of my little prejudices), and secondly and more important it has built in logging as a feature.

One important note, PakRatt II runs only under DOS 3.0 or higher and also interestingly supports OS/2. Those of you running DOS 2.0 or older need to upgrade. This is well explained in the manual, which, by the way, is excellent.

When first loading up the program I had the old battery problem again. It suggests taking out the battery, but I have never done so yet! Just set the PK-232 up at 9600 baud with ABAUD off and it seems to work fine. They seem to think that 9600 baud is the best speed, but I set mine down to 4800 as the other program I am using with the PK-232 is fixed at that speed. Seems to work fine at 4800.

Well I don't have a mouse at home and tried cruising around the menus, option screens, and logging without one. It works pretty good, but the authors should have done a little bit more testing. The arrow keys do some kind of strange things in various menus and really don't go where they should (another opinion.) Also when you hit "enter" while logging, it moves to the front of the current line rather than accepting and moving to the next field. As I said I hate mice, but I think, to use this program most efficiently, a mouse will be necessary.

Finally, I figured out how to fool the program into thinking its hooked up to a PK-232. Any modem down the line will send enough back so that you can run the program. I then tested the software with a mouse at work and also ran it on a 43 line VGA (color) screen. As I figured, the mouse actually works a lot better, guess I might have to bite the bullet and get one for home usage (drat.)

There are lots of nice little things that have been done in this new version while the old basic functionality is about the same. For example one of the common problems with the old was losing your mailbox stuff. The new version, with the [-D] startup option keeps you from erasing the receive buffer. The new 7 character SelCall is automatically generated.

Keyboard editing, which many of you have asked questions about, is better than in the older version. It mimics the WORDOUT function of the old PakRatt. The basic problem with multi-mode controllers really can't be changed. This is a pretty good way to do editing and eliminates some of the problems.

On the negative side some of the screens are cluttered and have far too many explanations for keys not used. The baudot help screen has 25 % of the keys not used or 10 out of 39. And the authors used some double key stroke combinations and left simple keys like F8 with no meaning. Now we are talking picky here, RIGHT! Everything seems to work fine that I have played with in the program. Play here at work is known as ERAT (extensive research and testing.)

The logging part of the program deserves more discussion and all I can presently say is that it will solve lots of your problems when using a single computer for RTTY contesting. It does dupes and looks like for a single operator will be pretty easy to contest with one computer. Guess what we need here is someone to try it, perhaps in the upcoming BARTG contest.

In two months, I want to look at AMTOR on the new PakRatt II and also do a close look at the MailBox which might just be the most important thing on the PK-232 MBX and PakRatt II. Next month ARIES-II.

As a final note

Just finished the 1991 ARRL RTTY Roundup which was a contest that I helped create a couple of years ago. I ran low-power 150 watt Multi-operator with Jim, WB7AVD and Betsy WV7Y. We used the test model of the PK-232 for sending and received on a HAL ST-6000. The software was the SCOTCHLOG program which we have been using in Spokane for years and which sends directly from the log using the PK- 232. It is ready! Software works great with the PK-232 and takes the pain out of dual keyboards. For more info check with the RTTY Journal Contest Writer.

73, de **Jay, Ws7i**

CONTESTING

Hal Blegen, WA7EGA
2021 E. Spangle Rd.
Spangle, WA 99031

I received a letter from John Barber, G4SKA. John is MR. BARTG now, being responsible for the administration of BARTG's numerous programs, one of which is the annual BARTG CONTEST from 0200 GMT, March 16th, to 0200 GMT, March 18th, 1991.

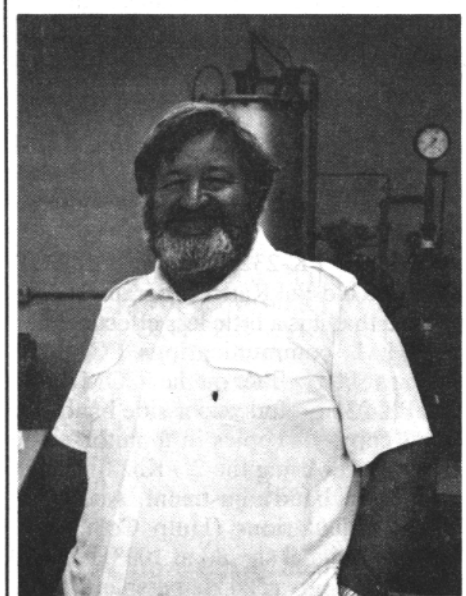
He apparently has some concerns over the collective competence of the folks who were competing in this contest. He explained that, in the entire mail-bag worth of logs received from last year's BARTG, only about six entrants scored the contest correctly. He didn't mention any names except to say that, despite my protestations of great wisdom on the subject, I was not among the six (W, VK and VE count as additional multipliers on each band, as well as each call area in those countries, an oversight that could have cost me 14 multipliers!) The following are excerpts from his letter:

Ed Burns, W3EKT (W3LPL) got a nice, convincing win in the single op. class with a bunch of the regular Euro Stations behind. He is using five separate RTTY systems ...one for each band... which I suppose is one way to make quick band changes. Single band predictably went to 4U1ITU operated by F6GMB on 14 Mhz, and Tony, GOATX did well on 21Mhz. Regarding the multi-op section I will only mention the ZB2 operation which had some very bad luck – they were operating close to the sea and got continual salt spray over the antennas. They only managed a few contacts on 7Mhz before a trap blew up. Much head scratching has gone on here about the BARTG rules for the coming years. I have gone through a process of careful analysis using the top 20 stations in this year's contest (1990) and rescoring the logs in various ways. I decided to alter the scoring to a very simple system, which with this year's entries would not have changed any of the top ten positions or winners of certificates. The contest exchange stays the same and I hope the score change will not deter too many stations from taking part. Your comments on having a low power section were given much consideration but in the end I feel it is impossible to enforce. As you know, power limits are different throughout the world... here we are only allowed 100 watts carrier on RTTY but I am sure this is ignored by some stations... and I am equally sure that in many countries there would be KW+ stations entering the low power section! It was pleasing to see a few single band entries this year as many stations will still be using old rules with single band section. The same will no doubt apply next year with the new scoring, but I will take care of that when they come in. No other changes in the rules will be made for the next few years as long as I am in the same position.

John Barber, G4SKA

All for this month. BARTG Contest Rules on page 21. See you in the BARTG Contest. de **Hal, WA7EGA** ■

Sid May, G4CTQ
****



Sid is a long time RTTY person. Some of his DX calls have been ZB2NIL, G0CTQ-ST2, A4XGB, 5N0SIF, and the first RTTY station in the Caribbean, VP2KH-VP2MKH. Sid is hoping to attend the Dayton Hamvention this year.

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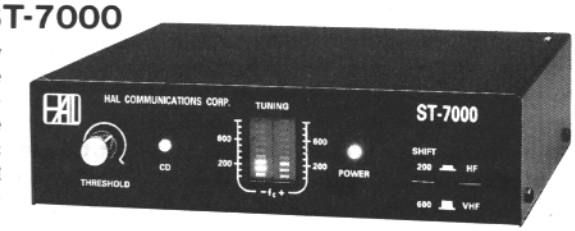

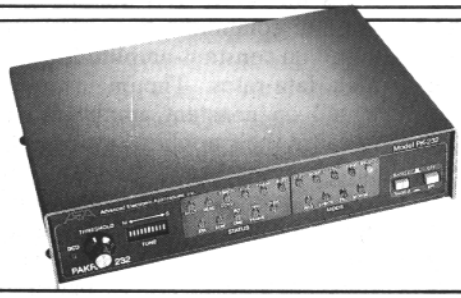

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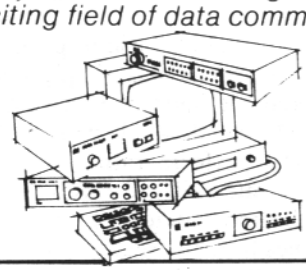
Obviously, we can fill in a system that you have already started. Or we can furnish a complete system to fit your needs and budget. For example, here's some suggestions for the amateur just entering the exciting field of data communications, or: for the amateur who wants the best available.



NO. 1 For the fun (and very affordable) mode, VHF Packet, AEA PK-88 with personal mailbox, 8K programmable memory and TCP-1 P compatability.
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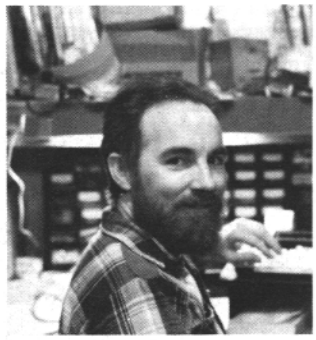
"CLOVER" is Here



Ray Petit, W7GHM, POB 51, Oak Harbor, WA 98277

Dale invited me to start a new column for the Journal, and on one of my favorite subjects: "High Performance" of HF data communication! The name of my game is getting "more bits for the bandwidth" in the rowdy environment of HF propagation. There is broad agreement: something needs to be done about the dismally poor throughput of HF Packet and the relative inefficiency of AMTOR when conditions are good. All the work, of which I am aware, has been directed at making relatively modest changes to the existing protocols, and we can hope that these efforts bear fruit. While the mythical PACTOR has not yet appeared, a far better alternative is on the horizon.

WHAT IS IT?

It's called CLOVER. It isn't an improvement on Packet or AMTOR, and it is not an adaptation of technology designed for other media. It is a NEW MODULATION METHOD, a NEW CODING STRATEGY, and a NEW LINK-LEVEL PROTOCOL designed specifically for the conditions found on HF: crowded bands, multipath, fading, dispersion, impulse noise. My prime goal for the Clover design has been to deliver the highest possible number of error-free data bits per second through a non-ideal HF path having the narrowest possible bandwidth. More specifically:

- Obtain a twenty-fold improvement in spectral compactness over narrowband FSK, with bandwidths measured at the 80 dB points.
- Use a set of modulation formats capable of delivering data at rates well above those of Packet and AMTOR in the best conditions, and at dramatically higher rates when conditions are poor.
- Implement a coding system which corrects errors in transmission instead of merely detecting them, such that retransmission of data is required only infrequently. The system should never require retransmission of data that has already been received successfully.
- Make the data path totally flexible, such that it can transfer any alphabet without restrictions and forbidden characters.
- Develop a collision-free networking protocol.
- If possible, without degrading performance, make the Clover modem capable of being used with existing radios of recent design.

DOES IT WORK?

The first goal above has been achieved in the design of the Clover signal waveform. The second and third have been demonstrated in a series of one-way on-the-air tests conducted last spring (for a detailed report, see the July 1990 issue of QEX). The fourth and sixth are being worked out in software now. Objective five is on hold, rolling around in the back of my mind. Any takers?

In this first of my columns, I'll discuss the modulation method used in the Clover modem. Next month it will be the coding strategy, and after that, the link-level protocol. Questions, comments, and "wish lists" are welcome!

ED: *This is the first installment of a series Ray will be presenting here in the Journal. Many of you have asked for this type of article and I'm happy to bring it to you. For the Newcomer to the Digital modes, this article may seem a little heavy. I suggest you read it carefully, Ray has done a excellent job of explaining this new method for all to understand.*

THE MODULATION METHOD

The Clover signal is a steady succession of smoothly-shaped pulses which are exceptionally compact in frequency. Clover defines five modulation modes, from the very slow to the fast, to accomodate changing band conditions. All of them use the same spectrally compact pulse envelope, but in different ways. The pulse rate is 25 per second, and for practical purposes, all the signal energy is contained within a channel only 100 Hz wide. All the pulses are on one frequency: this is not FSK! Data is carried in the difference between the PHASE (and in the faster data modes, the amplitudes as well) of successive pulses. The phase of each pulse is constant during the entire length of the pulse. The phase changes only when the carrier amplitude is zero, at the instant one pulse has ended and the next one is beginning.

WHY HASN'T IT BEEN DONE BEFORE?

Phase modulation on the HF amateur bands has been illegal until just recently, and for good reasons. The first is that conventional BPSK or QPSK generates enormous out-of-band radiation, a source of unnecessary QRM. In the seventies and eighties a lot of research went into finding ways to reduce these sidelobes for VHF-UHF digital radio and satellite communications. The work focused on constant-amplitude signals and high data rates. The engineers concentrated on constant amplitude methods because their applications used Class C or other non-linear rf power amplifiers. I experimented with a couple of these approaches for low data-rate applications, and finally discovered that amplitude shaping produces better results. Phase methods no longer have to be poor neighbors!

The second obstacle to using phase-encoded signals was simply that the accepted methods of receiving BPSK or QPSK which work well at VHF and above, perform rather poorly on HF. These methods all involve extracting a reference carrier by phaselock techniques from the received signal and then using that reference to recover data. This works fine provided the signal level is fairly constant and not subject to the kind of rowdy phase variations and noise typical of HF. Digital signal processing (DSP) routines and a careful tailoring of the signals to the normal conditions on HF have now solved that problem.

A third deterrent to using phase methods

has been that HF transceivers available to amateurs, until very recently, have had inadequate frequency accuracy and stability: FSK is much more tolerant. But there is no reason today from a technology viewpoint, why an amateur transceiver can't be made accurate and stable to within a Hertz. None are being supplied because there is no demand for it (yet!.) I have been circulating plans for a simple homebrew transceiver for one frequency on 30 Meters which outperforms every commercial ham transceiver in frequency precision. It connects to a frequency standard and is just as accurate as the standard!

A MEASURE OF BANDWIDTH WHICH MAKES SENSE FOR HF

The bandwidth of a signal depends upon your method of measuring it. If all signals were of the same strength, the internationally defined measure of "occupied bandwidth" would correspond to reality: the other guy's splatter is 20 dB below the level of the signal you want to hear: no sweat! But this measure doesn't make sense if the neighboring signal is 40 over 9 and he's right next to the faint DX signal you're trying to copy! All modulation methods require non-zero bandwidth, but virtually all methods are using more bandwidth than they need to if you consider it from this second point of view. CW has enjoyed the status of being our most spectrally compact mode. But even a CW signal is ridiculously wide if you require that a signal 60 dB stronger than your weak DX station does not cause interference. The key clicks are an un-avoidable consequence of the need to make the rise and fall times of the signal fairly quickly for crisp, readible CW. FSK signals generate sidelobes too, and a 170-Hz 300 baud FSK signal actually occupies the entire 2.5 Khz voiceband of the SSB transceiver when considered from this "no interference even if much stronger" point of view. Even if you used the best receiver with the best filters, you would not avoid the interference, because the transmitted signal itself is producing the noise that is "trashing" your DX.

The HF packet community made a tacit acknowledgement of the realities when it adopted the convention that adjacent packet channels be spaced 2 Khz apart. Even though the signals are using 170 Hz shifts, the stations must be much more separated in frequency to avoid mutual interference. (Coordinating the signals on the same channel has turned out to be a much more difficult problem!)

BANDWIDTH CONSERVATION

My first design objective in the Clover project was that the signal occupy the very narrowest bandwidth permitted by Nature for the chosen pulse rate – and the bandwidth was to be measured at the points outside of which the power spectrum never rises above a point 80 dB below the maximum at center-of-channel. By defining the bandwidth this way it would be possible to say with confidence that Clover signals spaced at this channel width would not interfere with each other: period. The "advertised" bandwidth will correspond to the actual needed bandwidth (see drawing next pg.)

Bandwidth conservation has the obvious advantage of relieving spectrum congestion. Today, as we know, competition for spectrum space is fierce, even within our own bands. Reducing bandwidth to the absolute minimum has another advantage: it improves the received signal-to-noise ratio by reducing the noise.

Why not rev it up a bit?

The waveform chosen was developed gradually with a lot of analysis and experimentation using Fourier transform methods. The calculated spectrum of this signal has only the one main lobe at center : It has no sidelobes at all! To take advantage of this exquisite compactness, Clover signals must be spaced at exact multiples of this sharply-defined bandwidth: to get closer causes channel overlap and QRM; to space wider wastes the spectrum space between changes. This means that to take advantage of the phenomenal bandwidth economy of Clover signals we have to have a rule about where they are placed: they can't be just anywhere! And the rule is: the center frequency of each clover signal must be 50 Hz above a multiple of 100 Hz. With Clover you will be able to operate on 14,000.050 Khz with confidence! In fact, Clover need not be in competition with other modes: it will be able to use frequencies no one else dares use. (Of course, I'm assuming you have an accurate radio!)

WHY NOT GO FASTER?

Twenty-five pulses per second is sure pokey in these days of multi-kilobaud modems. Why not rev it up a bit? Well, before I delve into the theory, it should be sufficient to observe that AMTOR, working at only 100 baud, often delivers data faster than HF Packet going at 300 baud. And Clover, operating at its pokey rate, outperforms them both. The BAUD rate of the modem is one thing, but the ACTUAL RATE AT WHICH DATA BITS ARE BEING DELIVERED TO THE DATA USER is another thing, entirely! Shannon proved that every bandlimited, noisy radio channel has a speed limit. If you stay under the speed limit, you can get data through with as low an error rate as you want. If you try to exceed this speed limit, all you end up receiving is gobbledygook, errors. The situation is somewhat like the proverbial tortoise and hare.

AMTOR was designed for HF, as its performance demonstrates. AX.25 was not designed for HF: is an adaptation of the commercial X.25 data protocol which was designed for good-quality VHF, UHF or cable channels where there is plenty of bandwidth available and the data sources are slow in comparison to the modem speed. High- speed telephone modems fail on HF because they are designed for channels having very high signal-to-noise ratios with fairly constant channel parameters. (Voice works well on HF because our minds can decode voice signals marvelously, even if they are enormously distorted!)

HF propagation paths can be modeled as a large number of narrowband channels in parallel, with each channel behaving more or less independently of every other. Each channel has several, or many ionospheric reflecting paths from transmitter to receiver, and the path by which the signal reaches the receiver with the highest power is continually changing. If the channel were to be thought of as an electronic network, we could say it is changing its "gain," phase, and propagation delay continually, to say nothing of the multipath "echoes." We've all seen the S-meters bounce up and down, and

with a prototype Clover receiver I've watched the phase of the most stable transmitter in the world wander and jump around in the most surprising ways. It's somewhat like the shimmering effects in the atmosphere that make stars twinkle. A signal that is wider than one of these "channels" ends up reaching the receiver with its various frequency components arriving at different times and at relative amplitudes and phases very different from the original! I remember as a teenager listening to AM voice signals with a receiver that put the lower sideband on one speaker and the upper sideband on another, as in stereo. I was astonished at the way the voice or music moved about the room! FSK modem manufacturers have observed how enormously different the amplitude of the mark and space signals can be, and have provided separate AGC amplifiers for each. And even though the transmitted FSK signal sends only a mark or a space at any instant, at the receiver a mark signal may overlap with the preceeding space because the two signals at nearby frequencies travelled to the receiver over paths which differed in length by hundreds of miles.

What does all this mean for choice of optimum pulse rate? Consider high speeds first. If I send data in a succession of pulses, these pulses must arrive at the receiver in the same order they were sent in order to be decoded correctly. If, on account of the channel dispersion mentioned above, signals were arriving with 5 millisecond variations in their timing, trying to send data with pulses spaced 5 milliseconds apart would produce unacceptible error rates. Observe that at 300 baud, the duration of a pulse is only about 3 milliseconds!

If I want to send data in the signal's phase, I can also end up going too slowly. In this case the measured phase at the receiver includes too much of the random phase changes in the path, and the data is lost. So the problem is: send pulses fast enough such that phase changes due to the data are fast in comparison to the propagation-induced phase variations, but slow enough such that the multipath dispersion of a few milliseconds does not cause the received timing of the signals to be upset. Most of the time on intermediate-length HF paths the dispersion is less than 5 msec. The Clover pulses are 8 times longer than this figure.

With 2-level FSK, you can send only one data bit per pulse. The only ways to increase speed are to increase the pulse rate or to increase the number of frequencies on which the pulse might appear : both methods gobbling up spectrum space fast. Increasing the pulse rate increases the occupied bandwidth and the data rate proportionally, and it reduces the requirements for frequency accuracy and stability in the radios. Given that at times the path can be really good, why not arrange to increase the pulse rate to the limit allowed by the channel? It's an appealing idea, except that now in order to avoid QRM from a neighboring channel, the channels have to be spaced at the distance required for the highest speed. And most of the time we won't be operating at that speed, and so a lot of that precious spectrum space gets wasted. But here is where the "phase" method instead of FSK really shines! With phase encoding, you can keep the same pulse rate and bandwidth while increasing the number of bits transmitted on each pulse right up to the limit imposed by the channel conditions! This is why a Clover system can send data at bit rates well above the pulse rate.

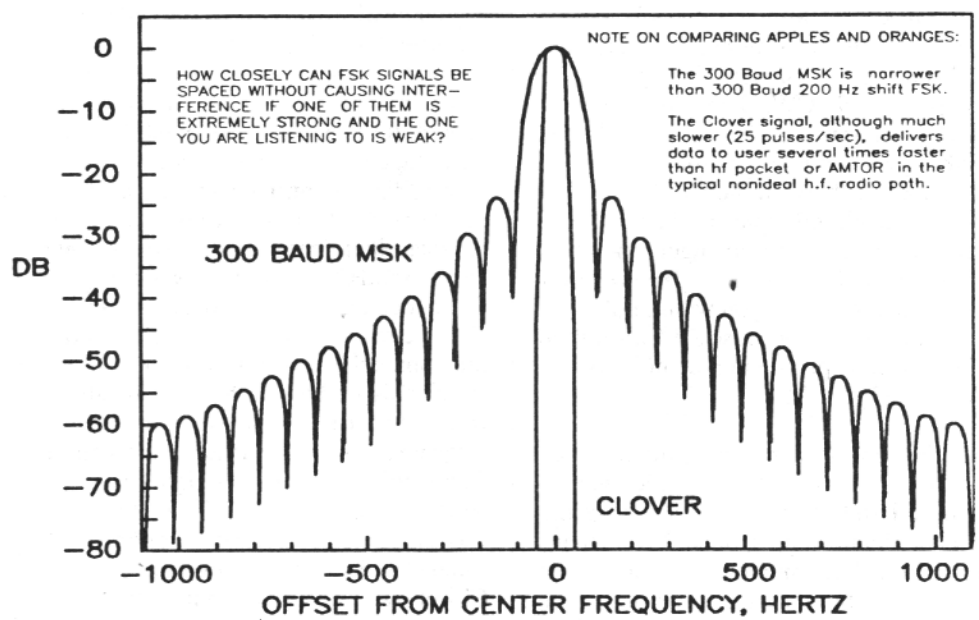
The five defined modulation modes are suited for conditions ranging from very poor to nearly perfect. The slowest is intended for use when there is adequate signal level at the receiver but the channel is so unstable that the phase of the signal is too broken up to be useable, such as during severe solar storms. In this mode a single bit of data is sent either as a pulse in the first or a pulse in the second of a pair of time slots. The receiver measures the total received energy in each slot, subtracts the results and decodes the bit according to the algebraic sign of the difference.

The second mode is best for very weak signals. Each pulse is sent either with its phase the same as the preceeding pulse, or it is reversed (180 degree phase shift). A phase difference at the receiver of greater than plus or minus 90 degrees decodes as a binary 1, and lesser differences as zero. The third mode is similar except that a constellation of 4 phase positions are defined, communicating 2 bits per pulse and requiring that the phase disturbances due to the channel be only half that which is workable for the second mode.

The fourth and fifth modes use a combination of phase and amplitude differences. The fourth uses 8 phase levels and 2 amplitude levels, communicating 4 bits per pulse. The fifth, which requires channel conditions to be nearly ideal, uses 16 phase levels and 4 amplitude levels, 6 bits per pulse. At 25 pulses per second, raw data rates range from 12.5 bits/sec to 150 bits/sec.

de **Ray, W7GHM** ■

ED: *Next month, the second installment. The Journal is pleased to present this series of technical papers on this new method of transmission. We plan to have more of this type of article in the coming months. Stay tuned!*



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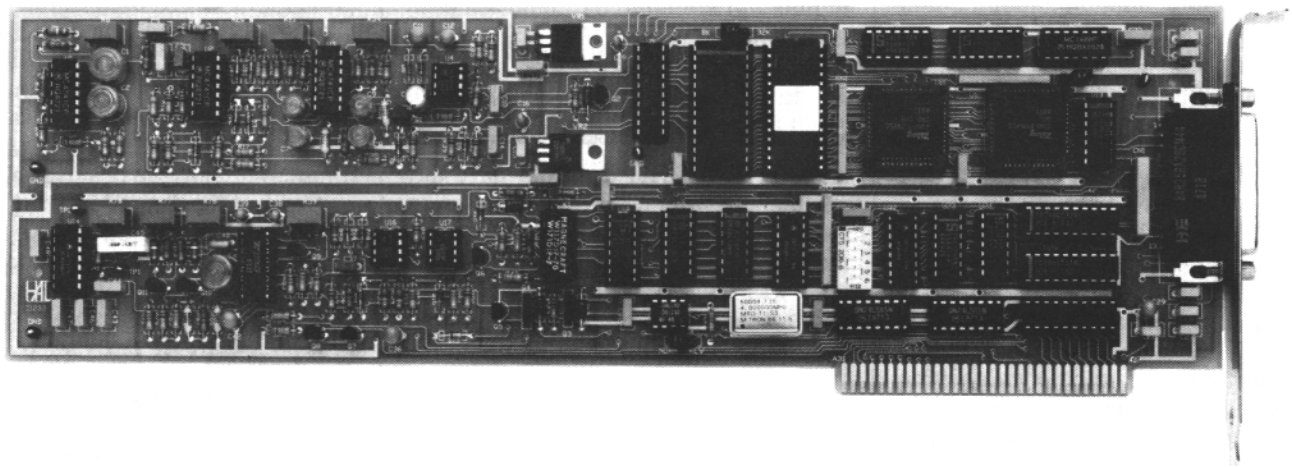

The HAL PCI-3000/PC-AMTOR system is designed to put your PC on the HF bands with outstanding performance at an affordable price. Amtor allows you to get through when other methods fail. If you've ever been DX-ing with someone on Amtor when 20 meters dies out in the evening, you know what we mean. Things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

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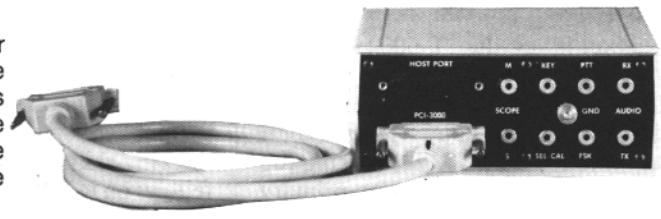
For ease of tuning your PCI-3000, add the SPT-2 Spectra-Tune. The Spectra-Tune lets you tune in CW and RTTY signals quickly and accurately with a calibrated linear 30-segment bar graph. The bar graph represents a 600 Hz range of the audio spectrum, centered at 2210 Hz for RTTY and AMTOR, and 800 Hz for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



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WE HAVE MAIL

Mr. Sam Powell, 1791 Berlin Rd., Wilmington, OH 45177 is a SWL who is interested in RTTY monitoring. He has just acquired several "RTTY DIGIAC Model CT-11" units, but no data, manuals or anything else to help with getting them up and running. Do any of our readers recognize the unit and, if so, can you provide any information as to where manuals, schematics or any other information may be found. I do not recall this brand name or model number so I will have to hope for assistance from our readers. Please send any info direct to Sam or to me for this column. It will be appreciated by all of us. Maybe we could get him going on receiving RTTY. After that he will be hooked solid and will be taking the Ham test soon thereafter! Thanks for writing to us, Sam.

PK-232 AND HAL ST-6000

Bob Reinholdt W7LZG, 270 Skycrest Dr., Ashland, OR 97520 has a Hal DSR 3000 KSR hooked up with a ST-6000 that still works great.

But he has been told that when the keyboard chip goes out, there are no replacements to be had. So he is looking for something else to connect to the ST-6000 and asks if it can be used with a PK-232.

The answer is yes, the ST-6000 will work very well with the PK-232 if you hook up the ST-6000 as an external modem to the PK-232. You will be limited to operation on RTTY and AMTOR when using the ST-6000 but if these are your primary operating modes, it may give you a bit better results in weak signal work. I gather from your letter that you would like to use the ST-6000 because of the convenience of the CRT display. You ask if there is a source or replacement for the 1" CRT in this demodulator. I believe this was a German made CRT but not sure. Reasonably certain it would be hard to find if Hal does not have any stock. Any reader know of a source or substitute? I still use my homebrew rack-mount ST-6 with built in 2" CRT which I built way back when Irv, W6FFC, first wrote it up in QST so I know how Bob feels about his ST-6000. Thanks for writing, Bob.

AND MORE MAIL

E. G. Roberts, K5XA, Greenwell Springs, LA 70739 is hoping for a future issue of RTTY Journal with articles or comments on using the Kenwood TS-940 S/AT on RTTY including any mods to improve operation in this mode. Are any of our readers using this rig on RTTY and have you found any useful RTTY modifications? If so, become famous by writing a long or short article on what you found. No doubt this will tickle the fancy of all our readers with TS-940 rigs. Thanks for writing to Dale about this.

AND EVEN MORE MAIL

This sure has been a good season for mail and I am thankful. Old timer RTTY Op Bill Jackson, W6OWQ, writes a very newsy note to Dale. Bill longs for articles written in the same vein as back when W6OWP, W6NRM and W6FFC were writing all those great RTTY construction articles. Bill mentions he has built several Kilowatt amplifiers that will run cool all day long on RTTY. Bill, you should scribble up the schematics and parts list and any construction notes for the Journal and Dale or I can pretty it up for publication. Don't worry about your drawing skills. Must be a number of you fellows on RTTY who would like to know of homebrew amplifiers that will take the rigors of RTTY operation. Bill mentions that Irv, W6FFC, is quite ill and would probably like to get cards from our readers.

YAESU FT-757 CW FILTER MOD FOR RTTY

Jim Sladek WB4UBD sends in another of his excellent RTTY rig modifications. This time it describes a mod to allow use of the Yaesu FT-757 CW filter while in SSB mode (which is what you need to cut the QRM if you are using AFSK on LSB). Jim says the basic design was breadboarded in late 1989, but the intended FT-757 has not been made available for actual proofing of operability. In short it has never been tried but should work. The circuit also has the advantage of being generic enough to use on most transceivers that use positive voltage levels to select the desired filter. Thank you Jim, for your continued interest and contributions. Please keep them coming.

FT-757 FILTER CONTROL FOR RTTY

by: **James Sladek, WB4UBD**

This modification is to permit use of the Yaesu FT-757 CW filter while in the SSB mode. In addition, this circuit can only be enabled in SSB mode (indicated "ON" by an associated LED) and will be turned off when the enable button is pressed again or when the transceiver is switched out of the SSB mode or powered down.

FT-757 Connections:

After making trace cuts on the RF Unit Circuit Board to break both the SSB and CW filter control lines (Figure 1), the new circuit (Figure 2) is connected as follows:

Control Ckt.	RF Unit Circuit Board
SSB	J10 pin 5 (SSB)
+8v	J10 pin 6 (8V)
TX8	J10 pin 8 (TXB)
GND	Any suitable ground point.
SSB FLT	SSB filter side of trace cut on SSB control line
SSB FLT SEL	Control side of trace cut on SSB control line.
CW FLT	CW filter side of trace cut on CW control line
CW FLT SEL	Control side of trace cut on CW control line.

Enable switch (S1 - momentary contact) and LED are bracket mounted at an exterior location on the transceiver (possi-

bly along the bottom front edge).

Circuit Operation:

When initially powered up, U1-Q is forced high by U1-S high and U1-J/K low (momentary condition in SSB mode) allowing CW or SSB filter activation via normal SSB FLT SEL to SSB FLT or CW FLT SEL to CW FLT path. With U1-Q high, U1-/Q is low and LED is not lit.

After power up and when in the SSB mode, momentarily pressing S1 causes a low-to-high transition at U1-CLK that switches the states at U1-Q and U1-/Q. This action turns on the LED and enables the CW filter with a high via U1-Q (now low), U2 and CW FLT path. Momentarily pressing S1 again will restore U1-Q and U1-/Q to their prior states and turn off the LED and deselect the CW filter. When not in SSB mode, toggling S1 has no effect and U1-Q remains high.

The ST-757 normally shifts to the SSB filter for transmit if the CW filter has been selected. To duplicate this shift, if U1-Q is low (when the CW filter is selected in SSB receive), TX8 (high on transmit) will force deselection of the CW filter and selection of the SSB filter.

Thank you, Jim. Now, who will be the one to incorporate this in their FT-757 and then write us with the results??

Until next month, Very 73

de **COLE, W6OXP**

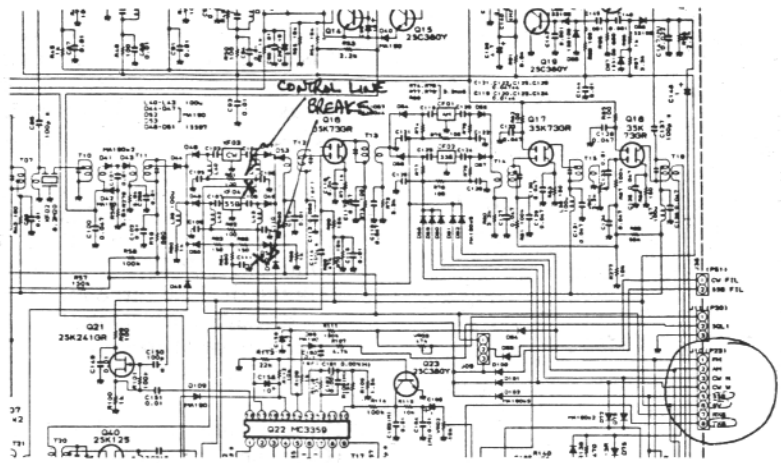

Figure 1

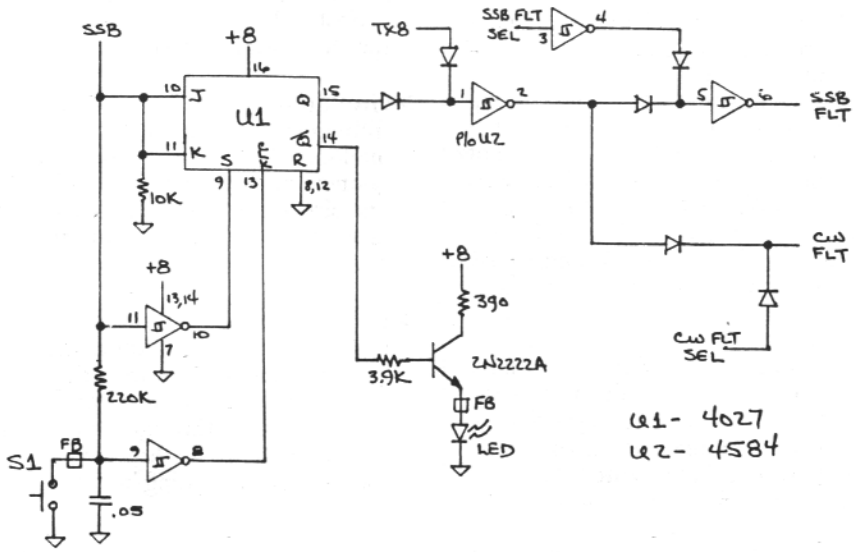

Figure 2

B.A.R.T.G. SPRING RTTY CONTEST 1991

TIME

0200 GMT Saturday March 16th to 0200 GMT Monday March 18th 1991. The total contest period is 48 hour but not more than 30 hours of operation is permitted (this applies to ALL categories). Time spent listening counts as operating time. The 18 hours non- operating time can be taken at any time during the contest but off periods may not be less than 3 hours per period. Times of operation must be shown on the contest summary sheet.

CATEGORIES

1. Single Operator
2. Single Operator Single Band
3. Multi-operator All Band
4. Short Wave Listener

BANDS:
3.5,7.0,14, 21 and 28 Mhz Amateur bands.

MESSAGES

RST, QSO NUMBER and TIME GMT. The QSO number must consist of a three digit group starting with 001 for the first contact made. The time must be sent as a full, four digit group and the use of "same" or "same as yours" is not permitted.

POINTS

Each completed QSO scores one point. Stations may be contacted again on other bands. Duplicate contacts on the same band must be clearly marked (and scored as zero points). No station may transmit on two or more bands at the same time.

MULTIPLIERS

All DXCC countries (INCLUDING W, VE AND VK) and all call areas in W, VE and VK count as a multiplier on each band. The same multiplier counts again on a new band. Proof of contact may be required in cases where the station worked does not appear in any other contest log received and does not submit a check log.

CONTINENTS - For scoring purposes, continents will be counted only once, regardless of the band worked. Maximum continents is six.

SCORING

QSO points x multipliers x continents (max 6).

LOGS

Use separate log sheets for each band. Logs must show BAND, DATE and TIME (GMT), CALLSIGN, MESSAGE SENT and RECEIVED, COUNTRIES and POINTS CLAIMED. SWL logs must contain DATE and TIME (GMT) of logging, CALLSIGN of the station heard, REPORT sent by that station and CALLSIGN of the station being worked.

SUMMARY SHEET

FULL SCORING, TIMES OF OPERATION and ADDRESS for correspondence must be shown, and in the case of multi-operator stations, the names and callsigns of all operators involved with the station operation during the contest. Any incomplete entries will be classified as check logs.

LOGS MUST BE RECEIVED BY MAY 25TH 1991 TO QUALIFY.

Send to: BARTG c/oG4SKA
32 Wellbrook Street
Tiverton,
Devon,
EX16 TJW, England

AMTOR

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

Another year over and deeper in debt! Sounds like a line from a famous song way back before I was a Ham. Tennessee Ernie Ford and Sixteen Tons, if memory serves me right. I am indebted to those of you who have written to me with kind comments, suggestions, requests for rig modifications and other information. PLEASE continue this trend for 1991. All columnists really do NEED input to be able to continue to provide you the readers, with interesting and up to date information on the varied subjects covered in this Journal.

It really boosts my morale to be recognized and called by name whether it is during a contest or just a rag-chew QSO. I apologize to those of you whose name I cannot instantly recall at the time of the contact. I think they call it "brain fade" on my part.

AMTOR HAPPENINGS IN 1990

CCIR 625 (1986) reared its head in the Amateur world, permitting, among other things, the use of seven letter SelCals instead of the "old" CCIR 476 four letter system. CCIR 625 has been used in the commercial (SITOR), ship to shore links for some years. Due to the greater possibility of "same" SelCals in the commercial field, it was decided to decrease the chance of calling up the wrong ship or coastal station, by increasing the SelCal system to seven letters or figures This reduces the chances of a "wrong number." Much like your chances of hitting the Jackpot in State run lotteries.

Both HAL Communications and A.E.A., to name two manufacturers, have kept up with the "state of the art" technology and are to be commended for their foresight. However, I still think that, for the foreseeable future, seven letter SelCals for Amateur use, are not going to be the "norm." In my opinion, the odds of you calling WAZT (W9AZT) and linking with N0AZT, are just as likely as winning the Irish Sweepstakes.

However, CCIR 625 does recommend more phasing, synchronizing or "idles," before and DURING an FEC transmission. The protocol requires a minimum of four "idles" every 100 characters. This may be fine for Commercial use where they have channelization and far less QRM. For the Ham bands, 100 characters represents about 17 seconds of transmission in FEC. Imagine how many "tuners," static bursts or whatever, can occur within 17 seconds on 20 meters! One "hit" and the receive station has to wait until the next set of idle signals before his system will print. How many times have you come across a station sending FEC and not been able to get any print, or all you see on your screen is, "pse KKK" at the end of his transmission. Very frustrating!

HAL Communications latest equipment sends a minimum of eight "idles" every forty characters and at the end of each line. this ensures that anyone just tuning the band will be able to "lock-on" to the transmission, even though he may not have been exactly on the transmit stations frequency at the beginning of the transmission. A.E.A.s trusty MBA-TOR software, far exceeds CCIR 476 and CCIR 625 recommendations when it comes to "idles."

In the coming weeks, I will be doing a lot more monitoring and calling up stations, just to see what their phasing is like. A review of my findings will be published here and I will probably write to the software/TNC manufacturers as well.

Incidentally, those of us using the older CCIR 476 will still be able to communicate with the later CCIR 625 systems.

ARQ-9 was another "newcomer," and I discussed what I knew about it, in the November issue. Basically, ARQ-9, if implemented, will send a block to nine characters per block. Our current ARQ-3, sends three characters per block. The initial ARQ contact will be made in ARQ-3, if band conditions or lack of QRM permit. The Information Sending Station (ISS) will then sense that traffic flow is good and it will instruct the Information Receiving Station (IRS) to be ready to receive blocks of nine characters, thereby increasing the traffic throughput. If conditions deteriorate, the ISS will revert back to three characters per block. Some pretty neat software and control signals are involved, however, ARQ-9 is only in a trail mode and it is used primarily in the commercial field at the moment.

NEW YEAR Resolutions

>Do not deliberately QRM HF Packet. It is a legal mode of transmission and it is "entitled" to use any portion of the bands where "digital" modes are permitted. I do NOT agree with its presence in the so called RTTY segment, so you would be better advised to USE the frequencies above 14.093 etc., and write letters to the ARRL Digital Committee, RTTY Journal etc. explaining that the three modes in 30Kz just doesn't work! One day, the message will get through. (No pun intended!)

>Promise not to send RYs in FEC. (Give them up in Baudot too!)

>Please stop sending a day, month, year and time information stamp at the beginning and end of each transmission. (Yawn) Any Ham worth his/her salt, should have a clock set in UTC and probably has a Playboy calendar on the shack wall. (I wish.)

>Give up the practice of "sweeping" a frequency in an attempt to locate a mailbox. If you don't know what frequency the box is on, wait until someone else accesses it, them make a note of your dial readout for future reference.

>Insert a CRTL–D, or whatever command your software requires, to end a FEC transmission, at the end of your FEC CQ buffer. That way you won't have to search through your manual for instructions on how to stop the transmitter from going into "warp factor nine."

That's it for this month, May be all have a very Happy, healthy and DX filled 1991
73 de **Eddie, G0AZT/W6** ■

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)

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FOR SALE: M-7000 from Universal Radio, never used. Best offer. William Prago, WA2CIJ, 517 Cumberland Ave, Teaneck, NJ 07666. Call (201) 692-8732

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FOR SALE: AEA CP-1, MBA/TEXT, Power Supply, Manual, $75.00. Microlog AIR-1 with AMTOR for C-64, Manual, $75.00. Kantronics Hamtext software for Applecomputer with Disk, Interface board, cable, manual, $17.50. Pat, WA4RGH, Call (804) 824-5337

RS-232C and COM PORT booklet: This is a compilation of all articles published in past issues of the RTTY Journal on these two very important topics. If you are using a computer in conjunction with Ham Radio, you will find this booklet an invaluable tool to have in your shack. The booklet contains information about COM ports 1,2,3 and 4 as well as the RS-232C information. You would need to reference many publications in order to obtain the same information contained in this booklet. Why do that? Send $5.00 to the RTTY Journal and you will receive a copy of this invaluable booklet by return mail, post paid.

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WANTED: Copy of software for Morse and RTTY for use with the Macrotronics Inc. "Terminal" interface. This is to be used with an Apple computer. Will Pay - Call (218) 286-3277. Thank you, Wally, K0VCC

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