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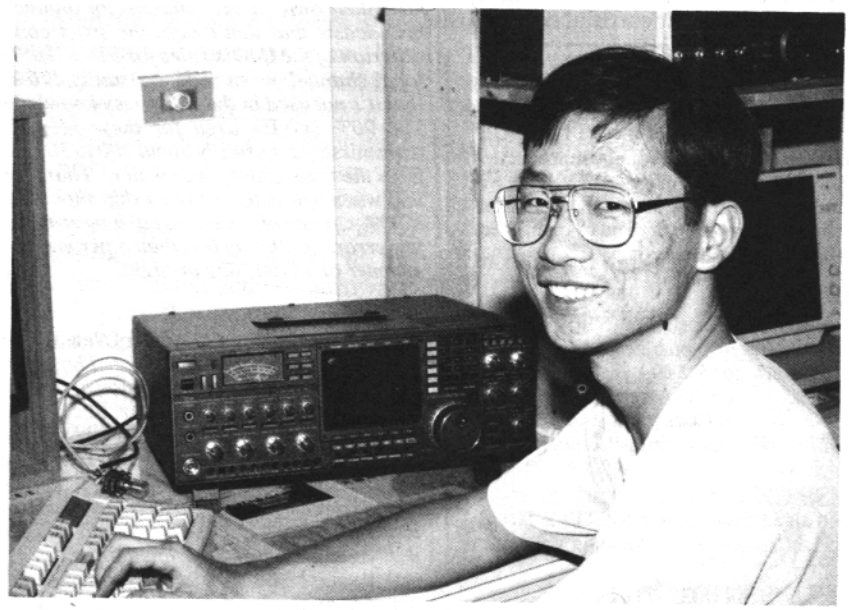
Lynn, DU1AUJ, the friendly RTTY voice from the Phillippines



Samuel, BV4VB, operating during the 1990 CQWW RTTY Contest

RTTY *JOURNAL*

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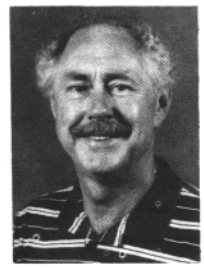

HITS & MISSES

Dale Sinner, W6IWO
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Fountain Valley, CA 92708

I have received mail recently asking why the Journal doesn't have space for letters to the Editor. Over the last couple of years, I have solicited your input indicating I would publish as much of it as possible. That still holds true. If you have something you would like to share with us all, or just wish to express and opinion, by all means, submit it. In fact, the letter below was directed to me and is herein published. So please, do write and I'll do my best to find space to publish your thoughts as long as they are in the realm of Digital material in which the readership would be interested.

Dear Dale,
"I would like to add some additional information about NAVTEX discussed in Jay Townsend's column in the December 1990 issue of the RTTY Journal. The information that Jay discusses is correct, I would simply like to add some additional information to that discussion.

"NAVTEX in the Navigational TELEX system that's used to disseminate navigation and safety information for deep draft ships entering and departing from coastal areas. The great thing about NAVTEX and NAVTEX like systems is that once you print a message correctly, you don't print it again, no matter how many times it's re-broadcast.

"The frequency 518 kHz has been allocated world wide for the transmission of these messages. Additionally, each nation can decide to have their own "local" channel for additional broadcasts that don't meet the strict content criterion of the IMO's rules for 518 KHz. This local channel, when used, is usually 490 KHz (but it's not used in the U.S. to my knowledge). The 90% service area for these MF RTTY transmissions is usually about 200 to 300 miles from the transmitter, over water. That means that when within this range a ship should have a 90% chance of receiving each message with few errors (probably less than 3 per message), summer or winter, day or night.

"I'm about 30 miles due south of New York city and about 4 miles from the coast. That puts me about half way between the Boston and Norfolk NAVTEX transmitters. I hear Boston pretty good and Norfolk barely. What's really interesting is that I hear New Orleans at night like gangbusters, 100% clean copy. The path from New Orleans to New York is definitely over land and is not short. So, please don't assume that you won't ever hear anything on 518 kHz just because you are inland. You probably won't hear anything during the daylight hours but at night, especially during the winter months, you should hear something.

"I use a BURHAN's active antenna in my attic and a BURHAN's up converter that's connected to a Drake R4C on 80 meters. You don't have to have one of the all-band receivers to monitor 518 KHz. The BURHAN's equipment is inexpensive and works much better, in my opinion, than most other "name brand" active antennas and/or converters. I strongly recommend it.

"It's also important to realize that the NAVTEX header is used other places than just 518 kHz. Transmissions on frequencies other than 518 (or 490) kHz can't be called it NAVTEX, by definition. I think a good generic term for any SITOR/AMTOR bulletin dissemination system that makes use of the ZCZC AG87 style headers might just simply be called "TEX" (as TOR is often used to refer to SITOR and/or AMTOR systems).

"ARRL station W1AW prefaces all their bulletins using AMTOR with TEX headers. I chose the name AMTEX (as opposed to NAVTEX) for the ARRL system. The meaning of the symbols has been altered but your NAVTEX compatible decoder will work just the same as on a NAVTEX channel. I wrote the AMTEX standard that was published as part of the proceedings of the 1989 ARRL computer networking conference. You can get the standard from that reference or by sending me a 9 x 12 inch SASE with postage for 2 ounces (45 cents as of today but going up soon). Be sure to mention that you want the AMTEX standard.

"AT&T's marine radio stations that transmit SITOR FEC (same as AMTOR) messages also make use of TEX headers. We will also see the Coast Guard using the TEX headers on their HF RTTY broadcasts as they phase out CW. This should start in the latter half of 1991. Since that system will be on HF (and not 528 KHz) a new name for that system will probably be coined. I'm sure that we will see other stations also making use of the TEX headers in the future.

"Please keep in mind that TEX transmission systems are not just to be found on 518 kHz. It's being used on HF today in the ham and commercial bands and its usage will probably continue to increase."

Paul Newland, ad7i

That's all for this month. Don't forget about Dayton, it's just around the corner.

de **Dale, W6IWO** ■

PACKET

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

This month's article is the result of a letter that I have received from Stan Hecker, AA5SP. Basically, he is having a problem with his Packet station. I am going to approach this situation a little differently, but I hope my solution will be obvious to all.

Setting up a Packet station

Our hypothetical station consists of a 30 amp power supply, HF radio, crystal-controlled VHF radio, dual port TNC, and XT computer with communications program. That is the system that I will configure up in this article.

The 30 amp power supply will power the TNC, the HF radio, and the VHF radio. So, the power cables will be needed. All power cables should have the appropriate gauge of wire for the application. Example: The HF radio gets 10 gauge, the TNC gets 18 or 20 gauge, and the VHF radio gets 12 or 14 gauge. While the cables are being built, I would include toroid cores at the equipment end of the cables. They will help keep RF from getting into the equipment from power cables and help kill off any generated RF from the equipment. Another item that should be added is power cable fuses at the appropriate ratings. It is better to play it safe in this area. Solder and insulate all connections to prevent shorts. My connections to the power supply will use ring connectors that are soldered to their appropriate wires with one wire per connector. Crimp connectors could be used here but by soldering the connection WELL, you reduce the resistance of the connection and help cut down on RFI-caused problems. RFI can be created at any junction that does not have optimum conductivity because an oxide layer can form and act like a diode within the crimp. Do not crimp and then solder. This can lead to solder cracking and an intermittent connection.

After the power cables are built, check them with an ohmmeter to make sure they are wired correctly. It is better to find out now if any wires are hooked up wrong, rather than finding out when something smokes because of wrong polarity, etc., after power is applied. After testing, connect the cables to the power supply and attach them to their respective pieces of equipment. Turn on the power supply and see if all devices turn on. Upon completion of this test, turn off each piece of equipment and the power supply.

From here on out, we will be setting up each piece of equipment and testing it immediately. This procedure may seem stupid and trite but it can save problems down the road and give you a reference on how the system works on a step-by-step basis. A system that can get complicated is best tested one step at a time rather than trying to find a system wide bug at a later date.

Turn on the computer. If you do not have the communications software loaded into the system, do so now. If you have some specialized software, like PC-PAKRATT from AEA as an example, load it in but do not use it yet. Instead, get a simple communications program, like the shareware version of PROCOMM, and use it first. I am going to make an assumption here that the computer has a Serial port card already. Run the "comm" program and set it up for the computer configuration that you have. Make sure that the program is set up for software handshaking and not hardware handshaking and that the baud rate is at 1200 baud. Plug the TNC cable into the Serial port. Jump pins 2 and 3 at the other end of the cable. This is assuming that you have DB-25s on both ends. If not, at the TNC end, jump the wires that are for the TX data in and RX data out. They are equal to pins 2 and 3 on an RS-232 jack or plug. Type on the keyboard and see if the characters you type are coming back on the screen. If you are not sure, disconnect the jumper and type again. If you still see the characters appearing, check the local echo, it may be turned on. If it is, turn it off. Now try again with the jumper in place. If you are getting characters, try it without the jumper. If you do not see the characters, then the computer and software should be working properly.

Now hook the cable to the TNC. Turn on the power supply and the TNC only. You should see some kind of "logon" signature or an autobaud sequence on the screen. Once you have communications setup with the TNC, put in your callsign using the "MYCALL" command. If you do not see anything, check your connections and wiring. You may have a pair of wires backwards. If the computer is set up for hardware handshaking, then the RTS/CTS/DCD lines need to be hooked up. If you are having these kind of problems, see if you can get a friend who has a breakout box to find out what is going on.

Now cables need to be built that go from the TNC to the radios you intend to use. Build each cable separately following the directions enclosed with the TNC and the instructions provided with the radios. Make sure you use shielded wire here. Make sure that the shield is grounded at one end only. This will prevent ground loops from developing. Once you have the cables built, hook them to the TNC. Take one port cable and jump the TXAU As an example, my TNC has the call of N6NKO-3. I issue a "connect" request to N6NKO-3 and I should see a "connect." If that works, issue a "disconnect" and then test the other port the same way. If all is working fine, make sure that the TNC is configured for the proper radio PTT polarity and most radios have the PTT line to ground. Most TNC's are usually set up this way. If that is not the case, you will need to get inside the TNC and move a jumper.

On to the radios that may be used. The VHF radio that I mentioned above is a crystal-controlled radio. This radio may work fine on voice but not on data. The biggest reason for this is that the crystals may be off frequency. The rocks have to be "dead on" or you will have trouble connecting to anyone. Any kind of passband distortion that may be generated by being off frequency can be enough to corrupt a correctly received packet. So, if you have a crystal rig, have it checked to be sure that the crystals are on frequency. Test equipment is required here because the ear will not do the job.

If you have synthesized equipment, it still should be checked because crystals are used here also. Another good practice is to have your radios tested once a year. Crystals do drift. An HF radio is the same way. All radios should be checked periodically for alignment and tracking between the RX and TX sections.

Hook up the TNC cable to the VHF radio, turn on the radio and turn the volume up (Some TNC's can run unsquelched.) By all means, make sure that the radio is set up according to the TNC's manual. Turn the radio to an active Packet channel and see if you can monitor the channel traffic. You may have to set "MONITOR ON." If all is well, see if you can connect to a local station. If you do, then all is fine for now. If you have another radio that works on the same band as this radio does, listen to your radio transmitting. This is best accomplished by having no antenna on the monitor radio. Listen to find out if your Packet signal is distorted or has a hum on it. If your signal is distorted, turn down the transmit level pot in the TNC until you hear it clear up. This will give you the proper setting. If you find that you can't get rid of the distortion, then there is a problem such as a mismatch, mis-wiring, etc. Beware, there are many signals out there that sound terrible because of overdeviation and power supply hum. Having a wide deviation signal does not translate into distance. All it translates into is frustration for yourself and resentment from your fellow hams on the channel.

Hook up the cable to the HF radio and tune in an active Packet channel. Make sure that the TNC is set up for HF Packet. Tuning here is quite critical and sensitive. Make sure that the monitor is "on" and take your time. HF Packet is weird and there are a lot of corrupted packets out there. As we start to lose the sunspots, HF Packet will become less effective on the higher bands. The proper level that you should set your transmitted signal to on HF will be while transmitting. Your ALC meter should barely come off the left peg or barely flicker. To much ALC action can cause distortion of your packets. You will also want to set your AGC to FAST. When you are receiving HF packets, see if you can connect to a strong station. It may not be instantaneous, but give it some time.

It may seem that the above routine is overly simplified but, when it comes to debugging something, we all have the tendency to look for the complex when it is something simple. I have been in field service for many years and I find that I have to keep reminding myself to stick to the basics. Check the power supplies, connections, obvious burned parts, etc. The above procedure is meant to be used as a guide for setting up a station or a procedure to help troubleshoot one that is being a little uncooperative.

KANTRONICS 9600

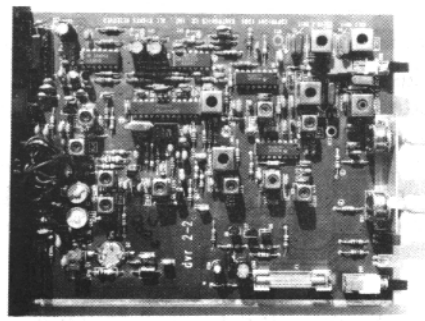
Well, I managed to get the DVR 2-2 on the air, finally. I tried to find someone who was within line-of-sight of my location so some tests could be run but, no such luck. So, I tried to connect with a friend of mine who lives north of me about 35 miles. Here comes the twist (no pun intended.) In order for a signal to get from me to him, it had to skirt two mountain ranges and cross a third. Needless to say, I can't call that, line-of-sight. He and I can talk simplex with no problem even though his signal varies from about 20 over to S-5 depending on the weather. We proceeded to send 9600 signals to each other and had some success when we had "PASSALL" on. In looking at the signal received, there was lots of multipath distortion on the signal resulting in phase jitter and the like. You can't fool Mother Nature. This situation is not the fault of the DVR 2-2 or the Data Engine. It was simply being fed bad signals. The requirements for 9600 are a little more strict than at 1200. We could connect up on simplex using the same equipment at 1200 baud with no problems. But, occasionally, there were some re-sends, however, for the most part, it was solid.

At 9600 Baud, it was exciting to watch the screen as the TNC would spit out a line of information. All I need now is to find someone locally, so I can finish this review.

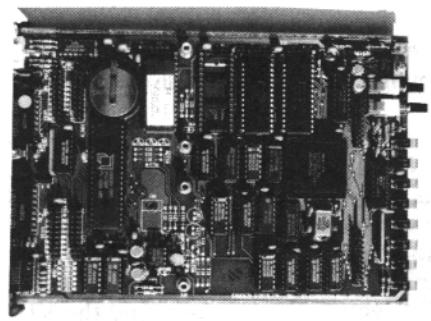
Also this month, I have some pictures of the insides of the DVR 2-2 and the Data Engine. Pic. #1 is of the inside of the DVR 2-2. Pic. #2 is of the Data Engine motherboard. Pic. #3 is of the 1200 baud modem card for the Data Engine. Pic. #4 is of the 9600 baud modem for the Data Engine. The boards are well built and the layouts are understandable. The Kantronics crew did an excellent job on these boards. My only suggestion would be to add some shielding around the receiver front end and the final of the transmitter sections of the DVR 2-2.

Peace be with you all

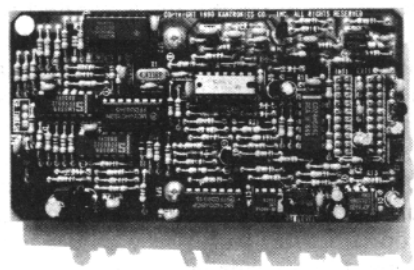
de **Richard, N6NKO** ■



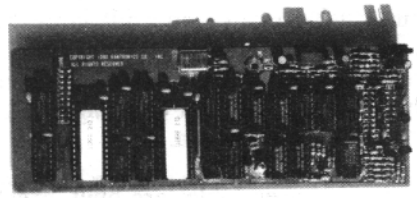
Interior view of DVR 2-2 radio



Data Engine Motherboard



1200 Baud board of Data Engine



9600 Baud board of Data Engine

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

DX NEWS

Jules L. Freundlich, W2JGR
17 Nassau Blvd.
Malverne, NY 11565-2317

I am glad to be able to pinch hit for John Troost, TG9VT, this month while he is on medical leave. It is a particular pleasure to be able to do John this favor, since TG9VT was my No. 100 DXCC country back in 1985, which resulted in my obtaining RTTY DXCC Certificate #101. In addition, I had the good fortune to be able to operate with John at his station in the 1987 and 1988 CQ WW RTTY contests. He and his XYL Chiqui opened their home to me. We all look forward to seeing John back in this spot next month. Good luck, John.

It is assumed that all you DXers keep current, as I do, by reading VK2SG's weekly RTTY DX Notes, (available Friday mornings UTC on APlink MBOs as well as MSOs on the National Autostart Frequency like KAOJRQ (MSOJRQ) and W5KSI (MSOKSI)), so I will not repeat what you probably already know. A good source, also, of timely alerts to upcoming rare ones is W6PQS's monthly IRDXA Reports which in recent months have been regularly input to the APlink network via TG9VT. The column this month represents somewhat of a change of pace from what you have used to reading. I hope you find it interesting.

DISSA AND DATA

Afganistan - YA

We have an unconfirmed report out of Central Siberia that Romeo will again be QRV from YA0RR some time in April.

Asiatic USSR-UA9

Still need Zone 18? Yuri, UA9YE, will be happy to oblige. Try reaching him for a schedule by sending a (excuse the expression) "packet message" to his BBS addressed to UA9YE @ RK3KP. Alternatively try to catch Yuri on 20 meter SSB around O1OOZ to set up a RTTY schedule.

Anguilla-VP2E

If you don't have this one in the log yet, you have not been listening. Dorothea, VP2EE, has been burning up the bands by being there for the deserving. This small island boasts probably more hams per capita than many other places. However Dorothea is the only active RTTYer at this time. The Mann family has OM Dave, VP2EHF, and XYL Dorothea, VP2EE. The Meacham family boasts OM Bill, VP2EBM, XYL Sara, VP2ESM, and Son Paul, VP2EXX. Paul is looking to get on RTTY soon if he can acquire the gear. A TI-99/4A with a Hamsoft cartridge has been earmarked for Paul but he still will need a low cost modem like a used CP-1. If you have one of those and would like to contribute it to Paul, send it to Allen, N2KW, at his call book address.

Bangladesh-S2

Jim Smith, VK9NS, reaffirmed recently to Carl, K6WZ, that he continues to be optimistic about being able to operate here, about the time you may be reading this.

Bhutan-A5

Jim also told Carl that he and Kirsti hope to be in Bhutan in early May. We sure hope that they can put out a RTTY signal that can be heard on the East coast (and West and Gulf coasts, and the Midwest also!) this time.

Clarion Island-XFO

A group signing XFOC was reported as being active from this island in the Revilla Gigedo group in late January. They will apply for separate DXCC country status. My NGS Atlas shows the island to be 200 miles from the main island (XF4) in the group. WFWL.

Congo-TN

No sign of any activity here of TN1AT reported to be active by Luciano, 15FLN. Anybody hear/work him yet?

Jarvis-KH5J

The cards from AH3C/KH5J appeared in January but the application for separate country status has not yet been received by the DXCC desk. We wonder why the protracted delay. Even if Jarvis is not favored for separate country status, your contact (and mine) are still good for Palmyra- Jarvis credit.

Kermadec-ZL8

Using a laptop computer sent to him by Jim, N2HOS, and a KAM furnished by the IRDXA, Ron Wright, ZL1AMO, should again be working RTTY sometime during March at ZL8 or some equally interesting place like Campbell Island or Auckland Island (ZL9). Keep eyes and ears tuned.

Malyij Vysotskij-4J

Early reports that your pinch hitting columnist would be the RTTY operator on a forthcoming M-V operation, unfortunately were premature. The subject is now moot as Martti, OH2BH, has advised me that due to the fluid political situation in that part of the world, the expedition will surely not occur in the near future.

Penguin Islands-ZS9

The official status report of the DX Advisory Committee (DXAC) says that "Vote has been delayed twice while more information was received and studied. Maps that were recently received are being reviewed, and a vote will be scheduled again the in the near future." So hold your breath and hang on to your QSLs.

Pitcairn Island-VR6

Bill, VR6WH, likes to thin the pileup by making short lists. Give him a chance. Suppress the urge to barrel through a transceive pileup. Use your receiver and your keyboard more effectively with frequent bursts of 2 or 3 of your callsigns as has been promoted for years by Bill WOLHS. It is amazing how effective good timing can be. (However I am not so sure it is effective when the DX station

is operating split and scanning a portion of the band; e.g., the YAORR operation! Has anyone out there done any statistical studies of his probability of intercept?

QSL VR6WH to Bill Haig, 12 Kauri Loop Road, Oratia, Auckland 1207, New Zealand.

Rodriquez Island-3B9

Roberto, 3B9FR, operating with IRDXA RTTY gear will willingly give you a schedule if you catch him on the SSB W7PHO Family Hour which runs on 21345 starting at 18OOZ.. Roberto is a frequent check-in and will usually meet you after the net at 2OOOZ. Lenny KB2HK, East Coast net control, will be happy to facilitate a schedule. QSL turnaround time is about five weeks.

Rwanda-9X

If you still need 9X, access 9X5LJ's APlink MBO on 14071 (21071 after 15OOZ) and leave a note for Jacques requesting a schedule. Or better still, catch him live with the (T) talk command and get it over with then and there. Remember an AMTOR contact counts for DXCC as does a (excuse the expression) Packet QSO as long as it is a one to one real like QSO.

St. Peter and Paul Rocks-PYO

Karl Leite, PS7KM, and the Natal DX Group will again activate this desolate spot in early May using CW, SSB and RTTY on 6 to 160 meters. Operators will be PY5AKW, PT7AA, PS7AB, PS7KM, and DJ9ZB. The last operation ended in near disaster and netted only a few dozen RTTY contacts. Contributions made out to the Natal DX Group and sent to PS7KM will be welcomed.

South Shetlands-HF, 4K1

In a December SSB QSO with your columnist HFOPOL said there would be RTTY from this location in January. As of this writing (early February) there have been no reports of such activity. If he should show up and you work him, you can probably get a QSL card from KB6GWX. We also have word that 4K1ADQ should be operational there for about a year. No sign of him yet.

Southern Sudan-STO

This one has not yet appeared on RTTY and would surely be a popular one. Peter, WB2WOW, tells that STODX is Dennis, ex- TZ6MG who works for a relief agency and is expected to be there for at least a year. It took Dennis over a year to obtain his license. This is a war zone and the security is extremely tight. Don't know if RTTY would be allowed. However, Dennis has told Peter he would be interested in RTTY if the gear was provided. Look for some heavy action by the IRDXA on this one.. QSL STODX via WB2WOW.

Three Happy DXers meet on Long Island in Summer 1990
L. to R. Yuri, UA9YE, Jules, W2JGR, and Valery, RA9YD

Thailand-HS

We received the good news from Ted, W2FG, that his RTTY card from HS1BV, was accredited by the ARRL for DXCC. So, rumors that RTTY is not allowed were premature. It would appear that the situation is, that it is not "not allowed" as opined by Lou, NN2G, who was a recent visitor there.

SOAPBOX

OPERATING SPLIT

Many RTTY DX operators in the last couple of years have fortunately learned the art of split operation. Is this because we have seen a migration of experience CW and SSB DXers? My guess is yes. I do not understand why RTTY DX stations who suffer from pileups still do not operate split. It makes life so much easier and more rewarding for both ends.

Prime recent examples of how to handle a pileup using split operation would include Jacky, F2CW, from 3Y5X, Dave, 9L1US, from all his locations, Eric, K3NA, who used KB2VO'S ST-6OOO from AH3C/KH5J, Alex, UL7PCZ, at 1SOXV, Eddie, W6/GOAZT, most recently from VP5/GOAZT and ZFIRY, Heinrich, DJ6JC, from TY9JC and 3D2HL. And the latest wrinkle is split operation during a contest by 9L1US. Will be looking to see what Dave's score is in the ARRL RTTY Roundup.

CQ WEST COAST?

What do we do with rare DX stations who ignore their own directional CQs thereby creating utter bedlam?

NEW DXCC COUNTRIES?

The NCDX Club has submitted an application requesting the DXAC to consider 3 changes to the DXCC Country List.

1. Deletion of the current DXCC country, HL (Korea).

2. Addition of the Democratic People's Republic of Korea (North Korea.)

3. Addition of the Republic of Korea (South Korea.)

This sounds like a nice idea but since there is no legal Amateur activity within N. Korea, the immediate effect would be to put one more country obsticle to acheiving DXCC Honor Roll without being able to work the (New) one. This is a situation not unlike that of M-V Island, wherein the DXCC desk agreed to add M-V Island to the list, if and when Amateur Radio became legal there. That time lag proved to be 18 years and I think established a pretty good precedent.

Last fall there was a flurry of independence movements reported out of the USSR. We had the Gagauz Republic (ga-ga- OOZ) in South Moldavia pro-

claimed by the Turkic minority. Also the "Pridneprovskaya Republic" (prid-NEP-rov-skaya) which centers around Tirasopol and encompasses 5 other towns located in the south of UO5. Add to this the "Tatar Autonomous Republic" (UA4F), declared its sovereignty and indicated it wanted to have equal status to the 15 main USSR republics. Considering the most recent events in the Baltic states, I would not want to make book on seeing any new DXCC prefixes soon within the USSR.

QSLING PRACTICES

Volumes have been written on this subject. Add this short observation. In September, 1989, I operated HD5Z in Ecuador for the CQ WW RTTY Contest. Frequent QSL information was given on the air. QSL direct to W2JGR was publicized in the popular DX bulletins and magazines. Those who sent cards direct to me received responses within a matter of days (once the cards were printed.) I recently received a batch of about 150 cards from the HC bureau (courtesy of Ted, HC5K) more than a year after the operation. It will probably take another 6 months before the replies are received via the ARRL QSL Service/Bureau. About 1/3 of the cards were from USA stations...some living less than 50 miles from me. And many said "Tnx for a new country." Moral: If a QSL manager is given, use it,unless you have lots of time to wait, or don't particularly care..

PROPAGATION ANOMALY?

Between January 20 and January 30, 1991 we saw the WWV Solar Flux Index jump from 199 to 367, a phenomenal rise of 168 units in a matter of 10 days!! During that week A-Indices were generally 5 or below, and K-Indices generally were 3 or less. Some days, to be sure, were bummers with flares and proton events thrown in. While SSB and CW frequencies offered choice DX from all corners of the globe almost 24 hour a day, the RTTY bands were relatively quiet. Here we have the conditions of a lifetime and it seems like RTTY is the silent mode. Do we have ionospheric absorption addressed selectively to the RTTY frequencies? Yet bring in a good contest and there are wall to wall signals. Where are you all hiding between contests? As a wise (?) man once said: "Use it or lose it."

CHANGE NATIONAL AUTOSTART FREQUENCY?

This subject is more in the domain of Dick, KOVKH, rather than your pinch hitting columnist. However, Karl, K6WZ, called to say he thinks it is a great idea to move to 14098 as a psychological marker between Packet and RTTY. My own thought is that 14098 is certainly an easier number to remember than that crazy one they use now, and the Northern California DX Foundation 24 hour/day beacon, at 141OO, has been a good marker for years, but of course it is CW! Lets face it, Packet has intruded into the RTTY slots with a vengeance. During the ARRL RTTY Roundup, I was having a moderately nice run on 7088 when a packeteer came on frequency and strenuously objected to the RTTY activity there saying it was a Packet frequency!

ACKNOWLEDGMENTS

If you have gotten this far you certainly hope that the "Guatemala Volcano" will be back next month writing the DX News: but in the meantime my thanks go to all who contributed information for this issue:... NN2G, WB2WOW, N2HOS, N2KW, UA9YE, VP2EE, W2FG, PS7KM, W2MT, I5FLN, OD5NG, W2IYX, K6WZ, the K2GX node of the Tristate DX Packetcluster Network, the NJ Newletter, and WWV.

73 and Happy Hunting

de **Jules, W2JGR** ■

SOFTWARE

Jay Townsend, WS7I
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The mail bag had lots in it this month. Larry, K6YUI, has an inquiry on updating his station and from what he writes, I would recommend the PCI 3000 Larry and you bet, Henry Radio is a good place to get it. Also, your new Epson should do the trick.

Dick, N6CMJ, wrote a nice letter about NAVTEX. He hears a lot of activity on 518 (center frequency.) He listens to C, G, J, Q, R, ?W and sounds like everything is working great.

Lee, W4DRH, takes exception with my comments about the PK-232 being hard to wire. He has two and didn't have any trouble. Lee is probably a retired guy with lots of patience! He sez that AEA does have a power supply (AC-4) the for the PK-232. But the "gem" that he sent, refers to "DECCA," a "long range navigational system used mostly by Britain." It operates between 70 and 130 KHz. It is a continuous wave system and integrates the relative phase difference between the signals received from two or more synchronized ground stations. Thanks, Lee, for that information.

Also received a long letter from Jim, N2HOS, that I will address in the near future along with some "on the air" comments from OH2LU. Finally to save my day, came a long letter from AL7BB whom I often spend time with on twenty meters ragchewing. His views on the ARIES-2 are what makes up the balance of this months column. Thanks BB.

ARIES REVIEW

In response to Cole Ellsworth's request for some input on ARIES-2, I have compiled these notes from my personal observations. I am hardly capable of doing justice to the program for all modes, as I normally only operate in RTTY, and thus have only explored this mode.

ARIES-2 (Amateur Radio Integrated Entry System) was written by Thom Ashton, (NY2I), as a universal software package for use with the modern multimode controllers, and as such, will support the KAM, PK-232 and HK-232 for full features, and any other RS-232 Terminal Unit in the ARIES Terminal mode.

Its features include, and I quote:

- **Read Frequency and Mode data from**

your rig into an electronic Log

- Control Xcvr Frequency, Mode, VFO, Filter, Scan, etc. from the computer.
- Have Radio scan based on Log search and programmable duration
- While listening to a Station Call, check to see if you need that prefix.
- Search a file by: Call (or Prefix)/ City/ State (Country)/ Date/ Time/ Frequency/ Mode/ QSL information/ or Remarks.
- Control an all mode Terminal Unit (TU) and incorporate Log data.
- Sort and Print Log search results to paper or a Logbook file on Disk.
- Print QSL labels.
- Add, Change or delete items from the Logbook file as needed.
- A manual mode allows easy typing to a "scratch pad area" or the screen with the ability to place items from the scratch pad into the log (great for manual CW copying or contest for example.)
- Run other programs while Aries-2 stays resident in memory.
- Makes use of a 43 line display (vs 25) if computer has EGA or VGA.
- Change TU modes (also speed, parameters) by simple one key presses.
- A Command mode lets you talk to a TU or Xcvr in its native code if desired.
- A Contest mode that allows instant Dupe checking in addition to filing all pertinent data and special exchanges.

With all the above listed features, I shall cover each of the ones that I normally use on a daily basis. I have the TS-940 with the IF-232C interface connected to the system. ARIES-2 polls the Rig for data on a periodic basis, and updates the Frequency and Mode for a continually updated screen. This takes up one RS-232 Com Port on the Computer, the TNC takes up a second Com port, and if you want to run additional Serial devices you will either have to continually change cables or add additional ports. I added two more ports for a total of four so I can also run a VHF Packet link and a telephone modem. The greatest thing about this feature is that the mode and frequency are instantly entered into the Log-database with no manual input. If one does not have the Interface to the Rig, it is a simple matter of using the Mouse, or direct Keyboard entry, to put this data in the Log-database area on the screen.

Auto Control

Though I have used the auto control of the radio frequency and mode, I find that this feature is not in my bag of tricks; however, it does work as indicated. Normally, I want to be in control of the VFO and Mode, so I elect not to use this feature.

Scan Mode

There again, I have tried the Scan mode, and it does work, but I have no need for it, so I don't use it.

One of the best features of this program, if there is a best one, is the ability to scan an incoming call, and with the click of a mouse key, know if I have worked the station before. With ARIES-2, one simply reads the call, name, city, state, RST, and comments off the air, and can instantly place them into the Log-database. With a mouse, one only needs to move the cursor to the proper block on the Log-data field, and click the left button of the mouse, or if in direct keyboard entry, hit a Control-Letter to do the same thing. The Call information is also entered into the Call-Exchange file, and once entered, all one has to do is hit the F4 key to send His Call - de - Your Call, which makes remembering calls a thing of the past. However, if you get into a "Round Table" then you still have to manually put in the added callsigns. While on the topic of the mouse, Thom recommends a parallel bus mouse, and I second his thoughts. I started out with a standard three button mouse, and used it for about a year with ARIES, and found it to be super for instant updates, however, needing the added room on the operating position that the mouse pad took up, I convinced the Little Woman that what I really needed was a trackball. I purchased a Logitech Trackman (parallel bus) and WOW like jumping from a VW bug into a Caddie. This device has a programmable track speed, and a ballistics feature that pinpoints the area on the screen like a cross-hair on a riflescope. So much for standard Mice.

Search data by what-ever:

I have been keeping my logbooks on the computer for several years, using software named "File Express," and it has done a super job for me. I use it to do all the contest sorting, printing, QSLing, and report writing for the logs, so when I got ready to use ARIES Log, I was struck with a small problem. Thom states that his log can be downloaded to standard databases using a fixed length ASCII file format, however, I wanted to UPLOAD my files, and no mention was made to that idea. I tried several different approaches, all met with little success, then I dumped his Demo Log file, and figured out the way he was inputing data, so I shall share it, so no others have to pull their hair out trying to accomplish this task.

The files are stored in serial fixed length ASCII format, in the following string: **CALL-11, NAME-10, CITY-20, STATE-20. MyRST-5, HisRST-5, Start TIME-5, EndTIME-5, DATE-8, FREQ-9, MODE-4, POWER-4, QSL-1, REMARKS-70.** So, after figuring this out, it was a simple matter of creating an Export file (Fixed Length ASCII) in that format, down loading the existing logbook files, and then after copying it to the ARIES directory on the Hard Drive, simply renaming it with a .LOG extension, and this gave me the entire years logbook addressable by ARIES.

Thom recommends the use of a Ram-Disk or a V-disk on the computer, and not being too computer literate, I had no real idea just what that would do for me, so I simply specified the log in the set-up data of ARIES, and booted the system. Up came ARIES as before, then a flashing info line comes on the screen saying words to that effect "just hold your horses, I am loading the Log Files"... so I waited, and I waited, and finally I see, "935 records loaded." Hummmm, lets see, it only took two minutes and forty five seconds to load the records, so I went off and did some fine RTTY work and was really pleased with the results of having the data pop up to the screen as I entered stations I had worked this past year. After a few days of waiting for 2.45 minutes each time I loaded the files, I finally decided to try out Thom's suggestion, so I created a V-Disk in the RAM memory, and while I was at it I created a small Disk-Cache, then I ran the same start-up procedure, and in 16, yes, 16 seconds, I got a happy beep to tell me that 960 records were loaded, and I was off and running.

The Sort and Print routine:

This routine works well, and the QSL label printing is in accordance with documentation, however, I ran into a problem with the label printing, as it wanted to print out a label for each contact I had made with the station, and not just the specified contact. More hair pulling, and back to the old standby database logs, then a contact with Thom. His suggestion was to enter a letter "T" for temporary in the QSL block of the logs, then do a search using the "T" as the key to search on, and then print out the labels from that search, then go back and change the "T" entries to "X" for exchange, or "S" for sent. It worked, but I had to express my dissatisfaction to Thom about the back-door approach, and he agreed that it would be something to look at, and possibly change in future releases of the software.

Manual Mode:

The Manual mode allows one to use ARIES while in SSB or CW operation and input the same data into the Log-Data files, so ARIES is not limited to Digital operation.

TRS Feature

Another super feature of ARIES is the ability to make the program go TSR (Transparent Stay Resident) while you go off and do other things like edit files, create new buffers, write letters or unimportant things, then simply by typing the word "exit," pop right back to the ARIES program and pick up where you left off. I have an editor loaded in the same directory as the program, so I can go to it and create all kinds of nifty brag files while on line. Speaking of buffers and files, ARIES gives you the ability to create as many as your heart desires. The number of brag files are unlimited as you can start out with a one letter file, and no extension, and go all the way up to an eight letter file, so lets see, a to z, then aaa to zzz, and so on.. Doubt if anyone would need that many.

Monitors

ARIES works well on monochrome displays, however, one should be warned that the impact of the different color areas of the screen will not be realized. CGA is nice, and easy to read, but EGA/VGA in its 43 line display is super. not unlike most graphics capabilities in some of the commercial software packages I use at work.

Contest Mode:

Now for the last of the capabilities of ARIES, the Contest mode. In the Contest mode, the Name block of the Log-data area of the screen changes its cloak not unlike some reptiles change their colors. When in the contest mode, a computer generated contact number is flashed in the Name block, when one enters the incoming contact number, it is placed before your own "msg" number and separated with a slash mark, and the next number in line takes its place, so one does not have to look over to the scratch pad beside the computer to see what number to send next. Also, in the contest mode, any fresh contact will be announced with a raspy buzz from the computer speaker, whereas a Dupe will be announced with a two-tone be- bop from the speaker. The data from the previous contact will flash to the screen, so it is wise to create a different log for each band worked, this way you don't get false reports on the screen from other legal contacts from the same station. Then it is a simple matter to go to the database, and consolidate the logs once the contest is over, and do all the other nasty things we have to do with the logs before sending them off to never-never land.

Now that I have covered the highlights of ARIES-2, I would like to add that the program is designed to work on any IBM compatible machine. The old rule of thumb is that if "Flight Simulator" will run, then it is compatible. Well I cannot say if this is a true statement or not, however, I will say that when I was running ARIES-1, I had no problem with my machine, but, when switching to ARIES-2, it was instant problems. Strange lock-ups from time to time, and a hot letter to Thom which was followed up by a phone call from him on his nickel, and we went thru all the set-ups of the computer, and some suggestions from him. Suggestions followed, and still problems, so back to him, and again full follow-up on his part, with additional suggestions to look for. In full fairness to Thom, I will admit, all the problems encountered were of my own doing. After many hours of frustration and ripping the system apart time and time again, I found that I had not set the proper switch on the motherboard when I installed the math co-processor chip several months before, and it had not shown up using the earlier version of ARIES.

The system I am currently using is an XT-Clone with 4 Serial Ports, a 2 Meg memory board, 20M Hard Drive, plus a Floppy of each standard format, so the poor thing is so fat it is about to explode, however, ARIES will run in the basic 640K of memory, and floppy disk only. From my experience, a hard drive is almost a must to realize the full potential of ARIES. For the interface, one RS-232 serial port is a must for basic operation, two if using the radio interface, and more if using additional equipment with the computer, such as an additional TNC for VHF or a Telephone Modem.

I hope this review of ARIES-2 from an RTTY Nut does justice to the program. It has worked as well on AMTOR, what few links I have made in that mode, and having never used it on HF Packet, I can offer no opinions; however, I feel it will work as well in that mode, for I can see no reason that it shouldn't.

To wrap it up, I think Thom Ashton has brought the Amateur community a well throught out product that lives up to all its promises. He is to be commended for his dedication to the Software he writes, and his pride in his work, as evident by the personal response to possible problem areas with his program.

de Billy Casper, AL7BB, 1414 Patterson St. Anchorage, AK 99504.

The next couple of months, my column will be longer as I review the COMPRTTY program, a nice system by David Rice, KC2HO, that I couldn't review completely the first time because I did not have a PK-232. David tells me, he has a new improved version of his software which I haven't seen. So I look forward to covering all the changes and enhancements.

Look for me during the BARTG. I will be doing a single operator, single band event.

de 73 **Jay ,Ws7i** ■

FLASH

PackRatt II Version V 4.0D is now being shipped to all users of V2.4G and earlier versions. If you have an earlier version and have not received an update, by the time this reaches you, AEA suggests you contact them direct.

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:

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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!

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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!

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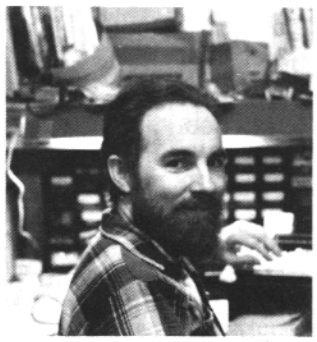


Ray Petit, W7GHM, POB 51, Oak Harbor, WA 98277

CLOVER (Part II)

In last month's column, I mentioned that on-the-air tests of a one - way Clover link demonstrated its performance advantages, but I didn't provide much detail. I'll make up for that now with the accompanying graph! Each vertical line represents a set of tests conducted with the help of the volunteers named.

The top of each line shows the Clover data speed, and the bottom shows the packet throughput. Each volunteer used a breadboard Clover modulator connected to his HF rig. We coordinated the tests either with CW transmissions or conversations on the phone. The Clover system, as it existed at that time, was capable of transmitting data at rates from about 15 bits/sec to 95 bits/sec. The slower data speeds are more robust: they get the data through in the poorer conditions the higher speeds can't hack. (Remember Shannon's theorem?) Our procedure was to send a test message at various speeds until we found the modulation and coding format which produced the highest error-corrected data rate at the receiver. (We were doing manually what the finished Clover system will do automatically.) We then brought up an HF Packet link (or attempted to!) to get a throughput measurement in the same band conditions and path. On several occasions we alternated back and forth between Clover and Packet.

In every case, except for "perfect" conditions, Clover outperformed Packet by wide margins. In four of the tests, we were not able to get any data through at all using Packet. Ironically, the best conditions we experienced were over the longest path. In this test, with only a few watts of RF, KL7EKI delivered a signal so fine that we went for several minutes without even requiring the coding software to correct any errors. The best HF Packet performance I ever observed was with the VE7AV bulletin board. I initiated a file transfer from the board in ideal conditions. There were no other stations on the frequency and his signal was strong and stable. This was an exceptional case. Most of the time, in very good conditions, I got rates nearer 50 bits/sec.

We were unable to obtain comparisons of Clover and AMTOR in poor band conditions. In moderate to good conditions, Clover delivered data at speeds up to three times the AMTOR design limit.

How about CW? Nothing matches CW for its simplicity and its proverbial ability to get through when all other methods fail. But in the 80 meter test with AK0X, Clover actually beat CW! The band conditions were so poor in that test that I could barely hear Ed, and he had to repeat single letters several times at modest code speeds before I could be sure I had it right. Our actual data throughput on CW was about 1 bit/sec. The Clover link delivered 15 bits/sec, error-free.

All the figures include the coding overhead: the rates shown are the actual data bits delivered to the receiving application.

The Clover link for these tests was one-way, and the data rates are based on the performance after the initial synchronizing processes had been completed. No time was spent waiting for acknowledgements. For this reason, actual two-way (connected) performance will be 10 to 15 percent slower.

I've been asked, "How does my measure of data speed in bits per second translate to something a little more familiar?" OK, good question! The number of printed characters per second (cps) is a good measure. To convert from bits/sec to cps, you must specify the character size in bits. If you code your data in 5-level Baudot, then divide bits/sec by 5 to get chars per second: 50 bits/sec gives you 10 cps. If you use ASCII, you divide by 7: the 50 bits/sec gives you just over 7 cps in ASCII. If you're doing binary file transfers in bytes, you divide by 8: now you have 6.25 bytes per second. "What about the start and stop bits?" I hear someone asking. With Clover, there aren't any: it is a synchronous protocol, and once the timing is established at the beginning of a transmission, the data bits go through without any further synchronizing pulses.

To get more "feel" for these numbers, consider how long it takes to fill a row of your 80-column computer screen. Take 80 and divide by the number of characters per second. For example, at 10 cps it would take 8 seconds. What's that in words per minute? If we assume that the average word is 5 characters plus a space, 10 cps comes out to 100 words per minute. Most people cannot type that fast.

CODING FOR ERROR DETECTION

Now let's examine methods of obtaining "solid copy" despite the inevitable, frequent loss of signal which is so typical of HF paths. Suppose the text I receive consists of five digit blocks, like Zip codes, and every one of the 100,000 combinations of digits is a valid word:

84503 56821 09462 55894 ...etc..

If errors are present, there is no way of even detecting them! Why? Because if any digit is changed, it produces a new data word which is just as valid as the original. We need to modify the way we encode the data. So we form a "checksum" by simply adding the five digits of each block and appending the least significant digi t of the sum as a sixth digit in the word:

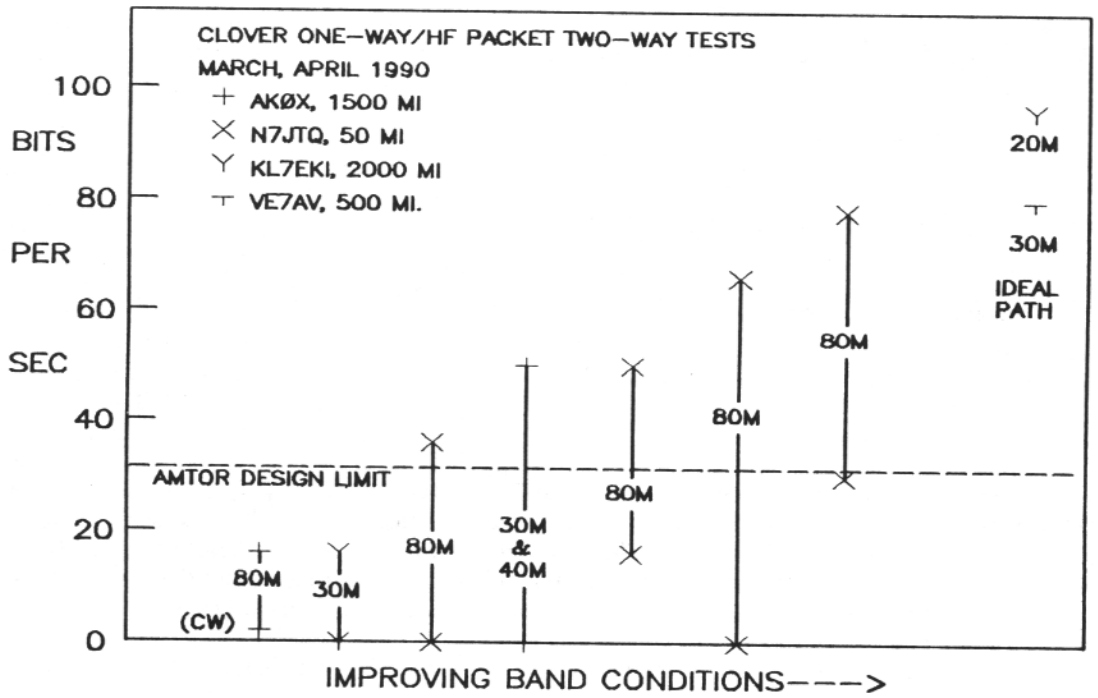
845030 568212 094621 558941 ...

Now, if any digit of a block is changed during transmission, the sum of the digits as received will not agree with the checksum, and the receiving process knows that an error has occurred. This scheme will detect single errors in each block. What about multiple errors? Observe that there are ten possible values for the checksum and only one of them is valid for a given data block. If we assume that the errors produce random results, there is a one in ten chance that multiple errors will produce a new data block with a correct checksum for the erroneous block.

Suppose now that we send data in blocks of two-digit numbers:

35 64 81 48 79 44 82 44 03 80

In this arrangement the checksum is a two-digit number having 100 possible values. If more than one of the digits in this block is randomly changed, the odds are



only 1 in 100 that it will escape detection. What are the odds if I form a codeword consisting of three-digit numbers with a three-digit checksum?

A block of data with additional symbols added which serve to check for errors or to correct them is called a codeword. The key to detecting multiple errors reliably is to use codewords in which the valid patterns are so overwhelmingly outnumbered by the invalid patterns that a valid pattern is nearly impossible to produce by accident.

With natural languages, such as English, this requirement is met to an extraordinary degree. Only two of the 26 possible single-letter sequences are valid words (three if you're a poet!). There are nearly twelve million ways to assemble "words" of length five using the English alphabet, but less than one in a thousand from all these possibilities is a valid English word. (Do you know 12,000 English words having five letters each?) The ratio gets even more dramatic as the word length gets longer.

HOW DO YOU CORRECT ERRORS?

Detection of errors is fine, but you still don't know what the correct word is, and it becomes necessary to have the sender repeat it. All data communication methods in amateur use today operate according to this rule. But experience tells us that we can correct errors without requiring repetition. We humans are experts in this game already: if a senz_nce has an occawional garbled __tter we cna quickly reconstruxt what was most likely the orfgina l text. (Note to Editor: 'sic'!) How do we do it? My intuitive answer would be, "Well, I looked at the text and saw in some cases what I expected to see: I didn't even spot the errors (I was error - correcting without knowing it!). When I did encounter a pattern of letters which didn't match a word in my vocabulary, I changed the fewest letters possible in the pattern to transform it into a correctly-spelled word which made sense in the context of the remainder of the text." In natural-language error-detection, we simply learn the thousands of valid sequences. We also learn a few rules from which we can make a reasonable guess if an unfamiliar sequence of letters is likely to be valid. Spell-checkers are natural-language error-detection and correction machines. But you can't put a spell checker into the memory of a processor built into a modem (yet!). There will never be any need to do that, because mathematicians have worked out elegant error-correction schemes which require very little memory, in comparison. These procedures function without having to know anything about the language being used by the source of the data.

The Clover system uses long blocklength Reed-Solomon error-correcting codes. The software converts a whole block of data into a single long codeword. The codeword may be 15 to 25 percent longer than the uncoded data. Like words in English, this codeword is one of a fantastically tiny fraction of all the combinations of symbols which is rated "valid." If some of the symbols in the codeword are garbled, there is enough left of the remainder of the codeword to distinguish it from all other valid codewords. The decoder mimics our ability to recognize what was intended when we see a garbled word. It changes the fewest number of symbols needed to produce one of the valid codewords and then transforms the codeword back to the original block of data. If too many symbols are garbled, the decoder knows that it has been beaten, and it reports a decoding failure. Then a retransmission of the data is required. By careful choice of the modulation method and the coding parameters the number of decoding failures can be kept low. One of the Reed-Solomon codes used in the Clover prototype can work with 7-bit ASCII characters. In a typical example, it takes 99 ASCII symbols, generate 28 more "locator" symbols, and from these produce a single codeword of 127 symbols of 7 bits each. The codeword is transmitted and received with possibly some of the symbols garbled. If not more than 13 of them were garbled, the original codeword is successfully reconstructed and then converted back into the original sequence of 99 ASCII symbols.

This type of coding is ideal for the conditions found on HF. Most of the time the signal is adequately strong and stable. But noise and selective fading regularly put buckshot through the message text. At a modest cost in the form of a reduction in the overall data rate, the coder delivers the entire text with all the holes repaired!

Next Month: (Protocol strategies)

de **Ray, W7GHM** ■

CONNECTIONS

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

Hi there. This issue we have many good technical articles, so will keep mine short.

WE HAVE MAIL

Received a most interesting note from Ike Griswold, WE7H, Box 1073, Douglas, AZ 85608. Ike was in Egypt (APO return QTH on letter) and about ready to return to the states. I hope he didn't get an extended tour over there!

Ike is very interested in AMTOR and also likes to monitor the commercial modes. He has been gathering literature on the various demodulators and systems. He says it is hard to find out where the equipment "rolls off" in the specs. Well, Ike, Madison Avenue never does put anything in an ad that talks about limits, if they can help it. Ike would like to know of anyone building/evaluating the RTTY project in Radio Electronics April - May? If anyone has done it, please let me or Ike know of your results. Ike would also like to see a bookshelf listing, and I will keep that in mind. It is an excellent idea.

Ike also passes along some very interesting information on Ham Radio in Egypt, even though it is discouraging. He says there is no way anyone can obtain a license through the layers of bureaucracy, although some are trying. The few locals who have the ticket want to keep the competition off the air.

To posses a transmitter there is very tricky, according to Ike. One of the men he works with brought in a Kenwood receiver (only). It was confiscated at the airport and held until he paid $100.00 to allow it to be shipped back home. (Shades of La Mordida!) Ike mentions a trip to Luxor and Aswan and he will be heading back home. Thank you, Ike, for a letter that I just had to share.

MORE MAIL - APLINK

In my December RTTY Journal column, I mentioned a question on APLINK hoping that Vic would answer and he did!

Dear Cole,

"I finally got around to reading the December RTTY Journal and discovered your question 'for Vic'." (The question - relating to a Packet operator's statement that APLINK was not very compatible with Packet, was 'Can APLINK be modified to handle the required format?')

"The answer is simple: nothing has to be done. APLINK moves traffic into and out of the Packet system all the time and has been happily doing so for a long time. With the release of version 5.0 on January 1, 1991 (Happy New Year), it also handles full h-routing, MIDs and BIDs fully automatically.

"What AMTOR does not do is handle the full ASCII character set and that does make many packetteers unhappy. You put a message in the system that looks like the Great American Novel and it comes out looking like a long telegram. There is no answer for it other than to convert from ASCII to Baudot and back. A bad idea I say. Air time is precious enough without adding significantly to it for cosmetic reasons. (There, that ought to bring a protest!) I suspect that question of format hangs mostly around the question of character conversion and nothing more.

"The bright side of AMTOR and APLINK is that it does deliver the goods. Try putting a message into the APLINK network and see how quickly you can get it to Europe or the Pacific - or, at the moment, to a sailor on one of the Navy ships in the Gulf. Or look at how well it is serving NTS now with a few stations moving and delivering several thousand TCC messages a month. APLINK is probably best thought of as a long haul (or difficult path), thin route system. HF packet has its place, too, on heavily used 'trunk' routes and neither mode is likely to replace the other in all circumstances. Someday (I hope) we will see a successor to both HF packet and AMTOR as we know it today that will give us the best of both worlds.

"One of the reasons (apart from its robustness) that APLINK has been so effective is the ability of an APLINK node to frequency scan. By scanning a small block of frequencies in each of several bands (which you can do now with modern HF transceivers) a path between any two APLINK stations is almost always available and many APLINK stations can share a small group of frequencies without stepping on each other. It is spectrum efficient and shares the band politely with other users regardless of their mode. AMTOR and APLINK does not require a part of the band to be set aside for its exclusive use."

Very 73, Vic Victor D. Poor, W5SMM

Thank you very much, Vic. I could not have asked for a better answer to the question posed last month! And thank you for allowing the RTTY Journal to publish it.

NEXT MONTH IS A BUSY ONE

With the very informative article on Clover data transmission mode by Ray Petit, W7GHM this month and for the next couple of months plus upcoming DSP discussions by Bob McGwier, N4HY, the Journal will be quite packed, so my column will either be very short or will miss a month or two. Believe me, I can use the respite! Its a funny thing, I thought as I got above sixty years of age, I could slow down a little. Instead it is the other way around, I get busier and busier at work, at home and in the ham shack.

Very 73, **Cole, W6OXP** ■

DAYTON 91

RTTY DINNER information and remittance form on page 17.
Don't delay, sign up today!

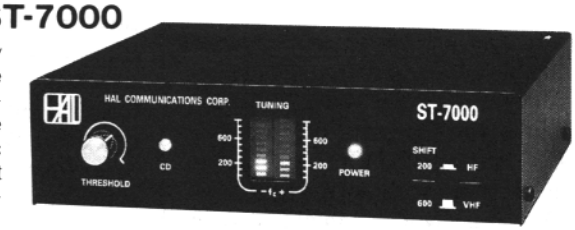
HENRY RADIO IS THE PLACE
. . .THE BEST PLACE
to fill all your data communications needs

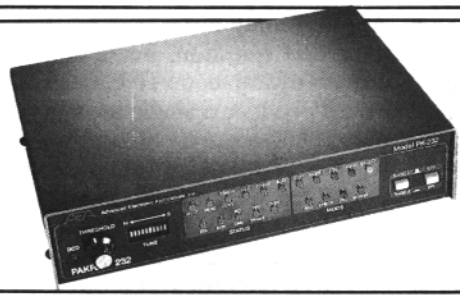
The TEMPO MPP1

. . .a unique new mobile data printer, includes a packet controller and a 13.6 VDC printer that interfaces with any mobile radio. in a recent user test it proved to have about twice as much audio level range tolerance as other TNCs. It is also an ideal unit for emergency work and a commercial version is perfect for dispatching service, emergency and police vehicles.

HAL Communications' ST-7000

HF-Packet Modem. . .a high performance modem designed specifically for 300 baud HF-Packet. It offers no-compromise performance to assure optimum operation under the most demanding signal conditions. Techniques developed for government and military use are used in the ST-7000. AGC-controlled AM signal processing provides a wide dynamic range. All filters and detectors are optimized for 300 baud HF-Packet. It offers the 200 Hz shift mode and a wider 600 Hz shift mode, each supported by separate 6-pole input filters and a 40 db AGC system.

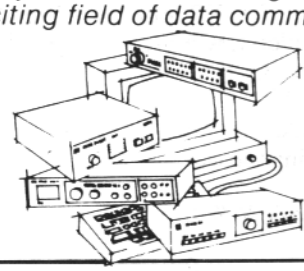




The PK-232 by AEA

. . .the only controller offering Morse Code, Baudot, ASCII, AMTOR, Packet, and facsimile Transmission & Reception plus the ability to monitor the new Navtex marine weather and navigational system. . .7 modes in one controller. The PK-232 makes any RS-232 compatible computer or terminal the complete amateur digital operating position. All decoding, signal processing and protocol software is on ROM. Only a simple terminal program (like those used with telephone modems) is required to interface the PK-232 with your computer. **Watch for the new and exciting AEA FSTV-430. Have fun on amateur TV!**

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-1P compatability.
For serious 20 M world-wide DXing on Packet, 200 or 600 Hz shift. . .add the superb HAL ST-7000.

NO. 2. . .top of the line! The HAL ST-8000 or HAL ST-6000 and AEA's PK-232 . . .the winning combination. You can't do better for all-mode, all-band enjoyment of hi-speed data communications.

If you have any questions concerning these units, or would like to discuss your requirements with a knowledgeable specialist, please call or ask for Fred Daukantas, N6SFD. We also carry a large selection of excellent commercial products for data communications and emergency systems as well as a complete inventory of amateur equipment and linear power amplifiers.

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AMTOR

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

From reading some of the mail on Baudot recently, it appears that there are still a lot of people with multi-mode controllers, who have not attempted to try AMTOR. One of the most common reasons given, appears it be "chirp-fright." Another misconception seems to be the capability of the rigs relays to cope with continual switching from receive to transmit and back to receive.

A No Nonsense Guide

Let's take "chrip-fright" first. There really isn't anything to fear about AMTOR. Even less, if you first try FEC, which is much like "steam RTTY", to gain some confidence before you take the "big step" to ARQ. Naturally a few minutes spent reading through your software TNC manual, would be a good idea. Some of these manuals tend to go into great depths on the subject, however the primary items of immediate interest to you are as follows: How do I embed MY SelCal into the software? How do I insert the SelCal of the station I wish to call in ARQ (mode A?) What key strokes are required to get the transmitter to send in FEC (mode B.) AEA MBA-TOR, uses Ctrl-B. How do I stop the transmitter in FEC mode? Usually with Ctrl-D. The +? is only used in ARQ to change the direction of traffic flow. It has no significance in FEC. How do I stop the transmitter while in ARQ, usually Ctrl-D, at the end of a QSO.

Forget about "switching times." Leave that parameter at default, usually between 20 and 30 millisecs. Once you have gained some experience operating ARQ, you can play around with the software timer and other parameters, if you wish. The CQ Call in FEC should be fairly short and frequent calls are more likely to get someones attention, than one or two long ones. Key the transmitter in FEC, let it "idle" (not text), for about 5-10 seconds then send something like this:

CQ CQ de G0AZT G0AZT G0AZT

SelCal: GAZT GAZT GAZT

CQ CQ de G0AZT G0AZT G0AZT

SelCal: GAZT GAZT GAZT

de G0AZT (GAZT) pse K

Notice the absence of RYRY? Your SelCal should be one of the last items in the CQ call text. Begin EVERY transmission with at least one CR/LF (carriage return/line feed), no matter which mode of transmission you use, including Baudot.

Once a link has been established, just type away. When you want to see what the other fellow has to say, hit +? and relax. Easy isn't it?

Trying an ARQ link

Tune around the band, for an FEC signal. Once you are in sync. with it, you should be able to copy the CQ call and SelCal. Input his SelCal as required by your software and with any luck the other station will start "chirping" back to you. Assuming that you have typed some text in your buffer, it will automatically be sent to the receiving station. After you have sent the usual, name, QTH, and report, hit +? and the link will allow the other station to do the same. From then on, you just continue in conversation using the +? as an "over." It's as simple as falling off a log but doesn't hurt as much.

What about my relays?

Have no fear, all modern day transceivers should handle the on/off switching and most of the earlier types will too. I used to own an FT101FD which although much modified for ARQ operation, never had a relay problem in three years of serious rag-chew QSOs, some lasting over an hour. One problem with earlier transceivers is that their AGC is somewhat slow to recover from TX to RX. However, modifications are available for most so called "non-compatible" transceivers. Send me an SASE and I will do my best to assist with proven modifications. In-depth articles to assist newcomers, can be found in the May/June 1990 issue of the RTTY JOURNAL, QST November 1990 and CQ November 1990.

MAILBOX

Bill, WA1EVD, wonders why there is very little Baudot or AMTOR activity on the WARC bands? Good Question. The standard answer seems to be, "we don't have antennas for those bands." Maybe we ought to start stringing up a few wires here and there and use the WARC bands more often. You would be assured of a good QRM free QSO. I know that there are one of two APlink stations who use 30M as an alternative to the overcrowded 20M band, and from what I hear, most of the SSB/CW operators on the WARC bands, only use a dipole and 100W. I had a 30M add-on kit for my Cushcraft A-4 beam but after much calling and no response, I gave up and removed the 30M traps. My rotor breathed a sigh of relief at the reduced windloading effect.

Ken, N9VV, asks if there are any AMTOR only TNCs. I really cannot answer that question, but I doubt if any current digital mode TNC manufacturer, would produce a single mode unit these days. The versatility of multi-mode controllers, certainly out-weights the prospects and cost of producing a single mode unit. Regarding a review of the MFJ-1278, a quick glance through the JOURNAL Index for 1984 to 1989 doesn't show anyone doing an in-depth review of that TNC. Maybe a note to Cole, W6OXP, our "CONNECTIONS" consultant, will produce the information you seek.

Thanks for your letters and keep them coming please.

APlink V 5.0

Vic Poor, W5SMM, has made one or two user changes to his latest version of a very popular mailbox system.

1. The format for sending a message to a specific station remains the same. Once the machine has gone through the destination callsign confirmation routine and you type "yes," the box will return with, "NRxxx to G0AZT GA SUBJ/MSG." Note that there is no longer a separate

exchange between user and machine for a "subject" heading.

2. The LU (list all registered users) has been deleted.

3. Once you have logged in, there is now an "expert" mode, but I have not tried it yet.

4. If you need to send a message that requires auto- forwarding by the SYSOP, you now have to give the correct routing. i.e. SP G0AZT ATxxxx. TX.USA.NA. To establish which routing to use, type the command RF and keep a hard copy for future reference.

There may be a few other user refinements but so far I have not found them. Incidentally, don't be shy about using any of the MBOs. They are virtually bomb-proof and no harm will come to them if you should mess up commands. Just note and follow the prompts and have fun.

Editorial Comments

I smiled when I read WA7EGA, Hal's, comments about scoring contests correctly. I know that I was NOT one, with only six entries in the BARTG, who got their scores right! I very much appreciate the various contest managers efforts to correct most of our incompetence. However, in my opinion, they should not be responsible for doing what should be the entrants job. Let's face it, if we don't read the rules and scoring procedures properly, why should we benefit from our mistakes? Maybe we would get the results of the contests much quicker, if the managers did not have to do our homework for us?

A few months ago, there was a suggestion that some of the AMTOR and Baudot MSOs should move up the 20M band and try to "force" the Packet stations to go above .100. In my opinion, it would not work. They would probably just move further down the band. Writing to the Editor expressing your concern and views would probably be more useful. Incidentally, I for one, would very much like to see a full and concise report of the Packet STAs finding. Maybe one day, when the "temporary" order expires.

That's all folks. Next month, my ideas on how to help eliminate alphabet soup on your screen in the SARTG AMTOR only contest due up in April.73

GL and DX- **Eddie, W6\G0AZT** ■

1990 ANARTS CONTEST RESULTS

Single Operator

PLACE	CALLSIGN	SCORE
01.	VK5RY	4,708,125
02.	UZ9CWA	4,073,182
03.	JA3SLE/1	2,041,966
04.	ZL2AKI	1,912,740
05.	VK2KM	1,485,024
06.	N6GG	1,402,820
07.	K6WZ/0	1,337,300
08.	VK2SG	1,296,768
09.	OD5NG	1.168,490
10.	W6/G0AZT	1,021,775
11.	PA3DBS	949,772
12.	VK2BQS	934,595
13.	HA5CP	743,080
14.	CT1BHX	718,000
15.	SM5FUG	697,600
16.	TG9VT	633,516
17.	RB5MT	632,155
18.	VK3EBP	628,316
19.	W2FCR	621,376
20.	OH2LU	591,140
21.	SP3BGD	479,860
22.	WB6ZHN	363,620
23.	G4SKA	360,500
24.	SP9BCH	345,560
25.	W1BYH	343,320
26.	JA2NNF	332,920
27.	G4MKO	331,640
28.	KC9UU	245,488
29.	KI4MI	239,074
30.	Y41MI	228,100
31.	AH6JF	194,375
32.	W3KV	183,830
33.	WA8FLF	183,410
34.	VU2SJV	170,160
35.	WA4MCZ	158,280
36.	WA3MME	157,240
37.	RA3DX	145,004
38.	UZ3AYR	126,064
39.	W2JGR	122,700
40.	I6KYL	103,660
41.	DF5BX	103,304
42.	JA1WYQ	96,408
43.	OM7TCL	36,000
44.	W2KHO	32,462
45.	SP9MAX	31,300
46.	LA2IZ	28,172
47.	SP3XR	20,136
48.	SP4KEV	18,100
49.	SP2UUU	17,920
50.	W6RLL	15,032
51.	OZ1FES	12,288
52.	SP9KVF	10,560
53.	Y27TN/A	3,537
54.	SP3IBM	864

Multi Operator

PLACE	CALLSIGN	SCORE
01.	VK2RT	5,951,072
02.	WA7EGA	3,592,400
03.	G3UUP	1,188,880
04.	LY1BZB	144,922
05.	SP3PLD	56,940
06.	SP2ZCD	12,740

SWL

01.	DE0GMH	278,248
02.	ONL383	192,100
03.	I1-21171	57,060
04.	UA0110-262	7,044

Check Logs: VK9LI, SKETPZ and SM5APS

Thanks to all for your interest in our contest. See you next year.

de **Bill, VK2EG**

Annual RTTY Dinner

Radisson Hotel - Dayton, Ohio
Regency Room
Saturday April 27, 1991

Buffet Dinner with all the trimmings.

Those who were there last year, enjoyed this plan, so we have made the same arrangements again for this year.

A No-Host bar will also be available from 6:30 - 7:30.

Dinner will start at 7:30.

TICKETS $23.00 PER PERSON U.S.

Tickets must be ordered in advance because the Hotel must have an early count. If not sold out a few tickets may be available at the door but no promises. Send check or money order to:

Robert Foster, WB7QWG,
11920 Cable Drive
Indianapolis, IN 46236

A short program will follow dinner, where a few announcements will be made and then the door prize drawing will be held.

MSOs

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

Someone asked "how cold" it was in Rapid City recently, (we set an all- time low temperature record for December, at minus 30 degrees air temperature), and I said that it was so cold that I saw a lawyer with both of this hands in his own pockets! Now that's cold! But Ol' Man Winter has treated us to some very chilly weather recently, including one day of minus 82 degrees wind chill. Is there any room left in Arizona?

HAL DSK-3100 DISK DRIVE SYSTEM

As these HAL disk drive systems age, its inevitable that some problems will be experienced by users. Let's face facts, these add-on devices were the rage of the RTTY group when first announced, allowing what seemed like unlimited storage of digital data, and freeing us from make shift battery backup systems used to keep susceptible MSO system RAM alive! But, as time and technology advanced, we've seen many strides in ways and means of storing and recalling digital data, and to some the DSK-3100 system may seem archaic.

One of the major complaints about the DSK-3100 system is that for unknown reasons the system will crash, taking with it to Never-Never Land the diskette and files stored on it. There have been many theories, user modifications, guesses and prognostications concerning the cause and remedy to these crashes, and you may take your pick as to the one that suits your needs the best. In all fairness, I should point out that there are those, (like Larry, KA0JRQ, of Glenwood, IA), who have had almost no problems with there DSK-3100 systems, and speak very highly of them. Conversely, there are others who have had continuing problems with this system, and blame premature balding, skin rash, and dandruff as side effects!

Recently, Brownie, K5FL, of Denton, Texas, seems to have developed a procedure that rejuvenates very stubborn DSK-3100 systems. In fact, I used this procedure on a DSK system that seemed to crash each time the dog howled, and it now performs every bit as well as when new. This procedure calls for the removal of all ICs that are in sockets on the DSK disk controller board, and the careful scraping of both the inside and outside of the pins, with a very sharp knife. This abrading effect cleans the IC pins, thus providing better contact between them and the IC socket. (I note that this very "cure" can also be applied to the IC-2 ROM chip in the Kenwood TS-940S/AT, which seems to eliminate problems with this unit as well.)

There are some precautions one should use when doing this procedure. Specifically, anytime you are removing, handling and re-installing ICs of any nature, you must practice good static grounding techniques. Do you have a wristwatch with a metal band? If so, put it on, and clip a test lead from the watch band to a good DC ground. (Do I need to say anything about making absolutely sure that the equipment is totally powered down, and unplugged from the AC mains, BEFORE you set yourself up as a super conducting ground system??) Secondly, only remove one IC at a time, and carefully observe its orientation in the IC socket BEFORE removing it. It's really embarrassing to have five or six ICs out of their sockets, only to find out that you've forgotten which IC goes in which socket, and "where the Devil is pin 1 of this IC.....???!" I use a small "pen knife" that I have carefully sharpened to do the actual surgery. Try not to bend the IC pins when cleaning them, and you do not need to clean off more than is necessary to make the pins shiny and bright.

Finally, my experience with the DSK-3100 has been a good one. In my MSO system I have experienced few problems with crashes, and it sure beats trying to keep RAM alive to save its contents. I have noticed that for some mysterious reason, new media (diskettes) should be formatted and put in service immediately if one does experience a crash. Good luck!

APLINK "GUARD" CHANNELS

I'm concerned that there are those out in APLINK-land who feel that they have some special authorization or entitlement to so-called APLINK "Guard" channels. Recently I have received correspondence from digital operators who have been castigated, harassed and otherwise intimidated by APLINK users and SYSOPS, because their digital signals may have been noted on one of these "Guard" channels.

In a letter just recently received, an APLINK SYSOP complains about, "the increasing incidence of QRM to OUR APLINK guard channels." It shouldn't be necessary to explain, but it appears that some SYSOPS fail to understand that NO FREQUENCY allocated to Amateur Radio use is in any way reserved, set aside or allocated to any individual user or system operator. We all live with the mode restrictions set by the FCC, but within those restrictions it is strictly a matter of who is first to use a specific frequency, and NOT a matter of who may have some automated system scanning or parked on that frequency.

Frankly, I'm impressed with the "scanning" technology being applied to equipment set up in APLINK service. It provides access to these systems under varying propagation conditions and generally allows for better utilization of the automated system. However, SYSTEM OPERATORS, who bear the ultimate responsibility to insure that their automated systems, do not interfere with established communications, must monitor their equipment and systems routinely to assume this responsibility. And, when a digital signal from some other mode, (RTTY, CW, ASCII, etc.), appears on one of the frequencies they are scanning, it should not be a matter of "what's this guy doing on MY frequency," but a matter of precluding his automated equipment from interfering with already established communications. It's the law, it's right, and until un-attended digital operations are authorized, it should be enforced.

It was very obvious to this author during the recent campaign to defeat the

ARRL's petition to the FCC concerning "unattended, digital operations," that many and varied interests were exposed. Automated, digital systems have their place in the scheme of things, and their popularity proves out that fact. But, there are many different interests in Amateur Radio, let alone the many different digital modes, and no one interest should prevail over another. It's time to stop this selfish "this is my frequency" concept, and understand that digital frequency authorizations are "ours," not "mine!" Amen! NEW MSO ON 30 METERS: Al Preisinger, WS7Y, of Kingman, AZ, has a new MSO system on 30 Meters. Al states that his system is parked on 10.140 KHz, (mark frequency), and all are welcome to use his system. It's a C-64 system, using the standard commands. The access code is //WS7Y, running at 74 baud, and the system is active from approximately 0800 to 2000 daily. Al also requests that I mention the requirement for a carriage return/line feed (CR/LF) after each command. As with other automated systems, it's this CR/LF that executes the command, and if you're getting the idiot treatment when attempting to use one of these systems, be sure that you're including it in your command string.

MSO RAMBLINGS:

Ten meter fans can experience MSO operations by checking into the KB0FTH MSO on 28116.87 KHz, (mark frequency). John Roman, Rapid City, SD, maintains his MSO on this frequency 24 hours a day. The access code is MSOFTH, and the baud rate is 74 baud.

A reader asks for some information on lightning protection for automated systems, and although not exactly my forte, I hope to provide a little input in a future issue.

Un-attended HF packet systems seem to be creeping down from the area specifically authorized by the FCC in their STA on this subject. Lots of complaints about these encroachments below 14097 KHz.

That's it for this month Gang! Can Spring be far off? —73—

de **Dick, K0VKH** ■

The FIRST SARTG WW AMTOR CONTEST 1991

We have the great pleasure to invite you to join the 1st WW AMTOR Contest run by the Scandinavian Amateur Radio Teleprinter Group, SARTG

• CONTEST PERIODS:

0000 - 0800 UTC, Saturday, April 20th
1600 - 2400 UTC, Saturday, April 20th
0800 - 1600 UTC, Sunday, April 21st

• BANDS:

3.5 - 7 -14 - 21 - 28Mhz.
The same station may be contacted once on each band for QSO and multiplier credits.

• MODE:

Only AMTOR. Use FEC (mode B) for "CQ SARTG CONTEST de selcal XXXX." Use ARQ (mode A) for answering and exchange of contest messages. Exchanging of contest messages in FEC or in any other way than ARQ is subject to disqualification.

• MESSAGE:

RST, QSO number, Name and QTH.
For a valid contact to occur, each station must also send and receive complete signs of both stations.

• CLASSES:

A) Single Operator, All Bands

B) Single Operator, Single Band

A + B) Same as (A) but with the addition that you may also enter a Single Band (B) of your own choice.

C) Multi-Operator, Single TX, All Bands

D) SWLs, All Bands

• QSO POINTS:

QSO with own country, 5 points; QSO with other stations in own continent, 10 points; QSO with other continents, 15 points. In Australia, Canada and USA, each Call district will be considered as a separate country.

• MULTIPLIERS:

Each country per the DXCC list will count as 1 multiplier on each band, including the first contact with Australia, Canada, and USA. Each call district in Australia, Canada, USA will count as additional 1 multiplier on each band.

• SCORING:

Sum of QSO points X sum of multipliers = Total Score.

• SWLs:

Use the same rules for scoring, but based on stations and messages copied.

• AWARDS:

To the top stations in each class, country, and district mentioned above, if the number of QSOs is reasonable.

• LOGS:

The logs must be received by June 10, 1991. The logs to contain: Band, Date/Time UTC, Callsign, Message sent and received, Points and Multiplier. Use a separate sheet for each band and enclose a summary sheet showing the scoring, class, YOUR CALL, NAME, ADDRESS and a signed declaration that all contest rules and regulations for your own license have been observed. In case of multi-operator stations, the CALLS or Names of all operators involved.

• SEND LOGS TO:

SARTG Contest manager
Bo Ohlsson, SM4CMG
Skulsta 1258 S-710 41 Fellingsbro
SWEDEN

WV7Y QSL Routes

These QSL routes were gleaned from the WS7I/PacketCluster, but, for the most part, come from the DX1 reports. For the latest, most accurate QSL routes, I still suggest the W6GO/K6HHD list.

73 and 88, de Betsy, WV7Y

3B9RF VIA Box 31, Rodriguez Island, VIA Mauritius

3DA0DX is Sam Ford, ZS6BRZ, Box 691, Gallo Manor,Sandon 2052, R S A

4Z80TA QSL VIA 4X6LM

9M6/JH1ROJ VIA JH1ROJ CBA

9Q5UN QSL VIA OH3GZ

9X5LJ QSL route is VIA Belgian Embassy, BP 01, Kigali, Rwanda

C6A/N4WFM VIA Jeanie Duff, P o Box 40842, Reno, NV89504-4942 USA

CX/LU5DF QSL VIA LU5FSB

FO5ED VIA Box 1746, Papeete, Tahiti

HH2PK QSL VIA N1DRS

HP1XZD VIA Panatronics S A , Attn Bill Draper,Box 2016, Balboa, Panama

J6LSC QSL VIA N9AG

J6LNN QSL VIA KB6ZBI

KD7P/KH7 and KD7P/KH2 QSL VIA Bob Winters, MOU3, PO Box 8265, Dededo, Guam 96912-8265 USA

LX150 VIA LX1OA

LY2BBF VIA Box 1029u, Vilnius, Lithuania, 232012 USSR

OX3EW QSL VIA KB5LRO

PJ8DFS QSL VIA SM5AQD

PY0FF QSL VIA W9VQ

RH8AX VIA A R Yagmurd, Box 414, Ashkhabad 8, 744008 USSR

UD6DM VIA Box 222, Baku, 370000 USSR

UG1700GWG VIA home call UG7GWG

UL7LR VIA Box 97, Dzhetygara 459430, Kazakh, USSR

UO5OC VIA Box 45, Kishinev, 277012, MoldaVIA

UV1AT VIA Box 200, Leningrad, 198328 USSR

UW0FZ VIA Box 140 Uzhno-Sahkalinsk City, 693000 USSR

UW0LZ VIA Box 75, Vladivostok 690090 USSR

V31JV QSL VIA N4RNR, Silvio Marini, 880 Wynnehurst St, Pensacola, FL 32503-2440

V73BN QSL VIA KX6DC

VP2EE QSL VIA KA3DBN

VP8CEL QSL VIA G4PVM

VU2SJV QSL VIA N2HOS

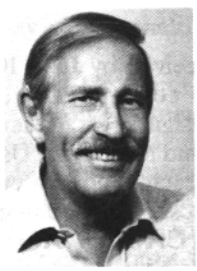
YA0RR QSL is VIA UT5RP, Dmitry S Slyusarenko, Box 300 Odessa 270000, Ukraine USSR, only for RTTY

YS/WD4IFN VIA Herman H Franke, U S Embassy, APO Miami, FL 34023 USA

ZB2JB VIA Box 292, Gibraltar ZD8BOB VIA Box 2, Ascension Island

ZS1/ZS9Z QSL VIA OH2BH

ZS9Z QSL VIA ZS6BCR



COUNTRY SURVEY

John Troost,TG9VT
444 Brickell AVe Suite 51-265
Maimi, FL 33131-2492

MOST WANTED COUNTRY SURVEY

Last year's Survey was most helpful in convincing new Countries to partake in the wonderful world of RTTY and resulted in Expeditions paying more attention to RTTY. MV- Island, to be up in the Spring, is mainly the result of this Survey, which also was a contributing factor in the YV0AA operation, HK0TU, and the recent operations of OH2BH from the Penguins and Walvis Bay.

We therefore again request that you complete the Survey form on page 22 and return it to me by March 31, 1991. Please take a few minutes to fill in the form, so we can make plans for more RTTY from distant lands.

The Survey form is entirely different this year. This time I have included the complete ARRL Country list. Beside each country name I have allowed a space for you to make an "X". Place and "X" adjacent to those countries you need. As an Example, I have placed and "X" adjacent to ALBANIA, a country that has never been on RTTY.

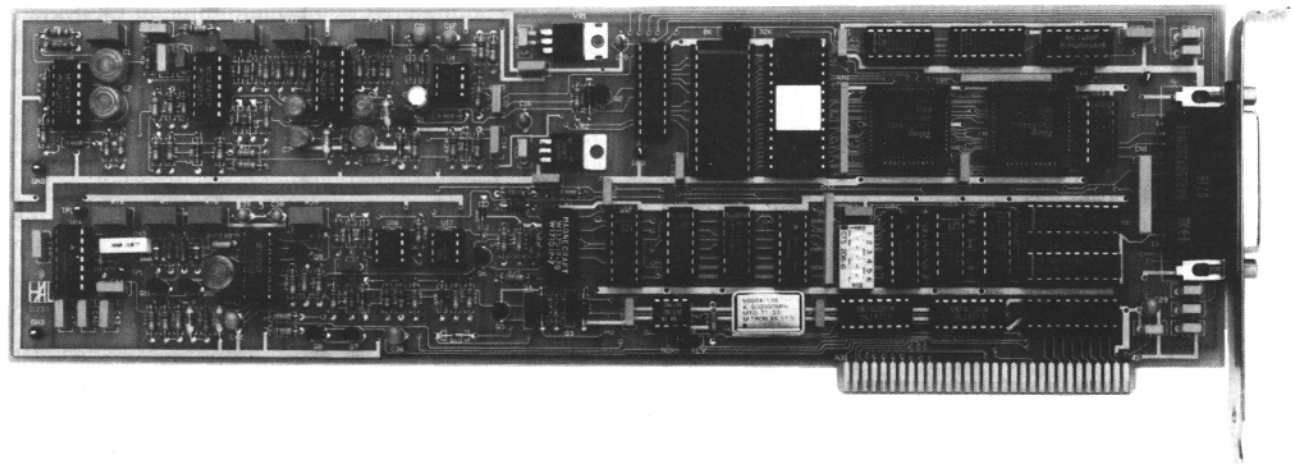
If the number of countries you have worked on RTTY is relatively small, then instead of using the "X" method, simply draw a line through those countries you have worked.

I hope this is clear and I much appreciate your taking a few minutes to fill out the form and then returning to me by the deadline. I hope to have the results published here in the Journal in the May issue. Return the form to me at my Miami address.

Thanks, best 73, and Good DX

de **John, TG9VT**, on the fiery volcanos of Guatemala

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



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

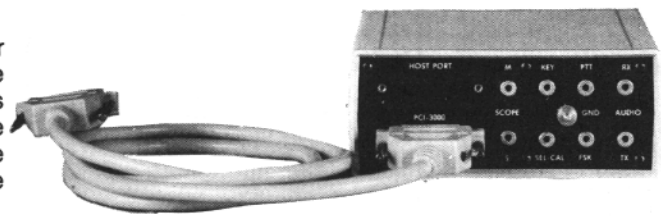
The PCI-3000 doesn't limit you to Amtor. You also get high-performance Baudot and ASCII RTTY, CW, and Search Mode. Search Mode lets you simply tune in the signal—we take it from there. The PCI-3000 automatically finds the correct code, speed, and polarity. No more guessing!

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

SPT-2 Spectra-Tune:

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

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



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

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

(Low tone export models available.)

CIRCLE 58 ON READER SERVICE CARD

MOST WANTED COUNTRY QUESTIONNAIRE - 1991 (Use a ruler and mark with an "X" to indicate your preference)

Prefix	Country
A2	Botswana
A3	Tonga
A4	Oman
A5	Bhutan
A6	United Arab Emirates
A7	Qatar
A9	Bahrain
AP	Pakistan
BV	Taiwan
BY	China
C2	Nauru
C3	Andorra
C5	The Gambia
C6	Mozambique
CE	Chile
CE9/KC4	Antarctica
CE0A	Easter Is.
CE0X	San Felix
CE0Z	Juan Fernandez
CM	Cuba
CN	Morocco
CP	Bolivia
CR9	Macao
CT	Portugal
CT2	Azores
CT3	Madeira Is.
CX	Uurguay
D2,3	Angola
D4	Cape Verde
D6	Comoros
DL2	Fed Rep. of Germany
DU	Philippines
EA	Spain
EA6	Balearic Is.
EA8	Canary Is.
EA9	Ceuta and Melilla
EI	Ireland
EL	Liberia
EP	Iran
ET	Ethiopia
F	France
FB8W	Crozet
GB8X	Kerquelen Is.
FB8Z	Amsterdam & ST. Paul Is.
FC	Corsica
FG	Guadeloupe
FG, FS	Saint Martin
FH	Mayotte
FK	New Caledonia
FM	Martinique
FO	Clipperton Is.
FO	French Polynesia
FP	St. Pierre & Miquelon
FR	Glorioso Is.
FR	Juan de Nova, Europa
FR	Reunion
FR	Tromelin
FW	Wallis & Futuna Is.
FY	French Guiana
G	England
GD	Isle of Man
GI	Northern Island
GJ, GC	Jersey
GM	Scotland
GU,GC	Guernsey & Dep.
GW	Wales
H4, VR4	Solomon Is.
HA	Hungary
HB	Switzerland
HB0	Liechtenstein
HC	Ecuador
HC8	Galapagos Is.
HH	Haiti
HI	Dominican Republic
HK	Colombia
HK0	Malpelo Is.
HK0	San Andres & Providencia
KL, HM	Korea
HP	Panama
HR	Honduras
HS	Thailand
HV	Vatican
HZ,7Z	Saudi Arabia
I, IT	Italy

Prefix	Country
IS	Sardinia
J2	Djibouti
J3	Grenada & Dep.
J5	Guinea-Bissau
J6	St. Lucia
J7	Dominica
J8	St. Vincent & Dep.
JA	Japan
JD	Minami Torishima
JD	Ogasawara
JT	Mongolia
JW	Svalbard
JX	Jan Mayen
JY	Jordan
W	United States of America
KC6	(E.Caroline Is.) Fed Sts. Micronesia
KC6	(W.Caroline Is.) Republic of Belau
KG4	Guantanamo Bay
KH1	Baker,Howland & Am Phoenix Is.
KH2	Guam
KH3	Johnston Is.
KH4	Midway Is.
KH5	Palmyra, Jarvis Is.
KH5K	Kingman Reef
KH6	Hawaiian Is
KH7	Kure Is.
KH8	American Samoa
KH9	Wake Is.
KH0	Mariana Is.
KI7	Alaska
KP1,	Navassa Is.
KP2	Virgin Is.
KP4	Puerto Rico
KP5	Desecheo Is.
KX6	Marshall Is.
LA	Norway
LU	Argentina
LX	Luxembourg
LZ	Bulgaria
OA	Peru
OD	Lebanon
OE	Austria
OH	Finlan
OH0	Aland Is.
OJ0	Market Reef
OK	Czechoslovakia
ON	Belgium
OX	Greenland
OY	Garoe Is.
OZ	Denmark
P2	Papua New Guinea
P4	Aruba
PA	Netherlands
PJ2	Neth.Antilles
PJ5	St.Maarten,Saba,St. Eustatus
PY	Brazil
PY0	Fernando de Norontha
PY0	St. Peter & St. Paul Rocks
PY0	Trindade & Martin Vaz.Is.
PZ	Surinam
S2	Bangladesh
S7	Seychelles
S9	Sao Tome & Principe
S0	Rasd (Western Sahara)
SK	Sweden
SP	Poland
ST	Sudan
ST0	Southern Sudan
SU	Egypt
SV	Greece
SV	Crete
SV	Dodecanese
SV	Mount Athos
T2	Tuvalu
T30	W.Kiribati (Gilbert & Ocn Is.
T31	C.Kiribati (Brit.Phoenix Is.)
T32	East Kiribati (Line Is.)
T33	Banaba
T7	San Marino
TA	Turkey
TF	Iceland
TG	Guatemala

Prefix	Country
TI	Costa Rica
TI9	Cocos Is.
TJ	Cameroon
TL	Central African Republic
TN	Congo
TR	Gabon
TT	Chad
TU	Ivory Coast
TY	Benin
TZ	Mali
UA	European Russian SFSR
UA2	Kaliningradsk
UA	Asiatic R.S.F.S.R.
UB	Ukraine
UD6	Azerbaijan
UF6	Georgia
UG6	Armenia
UH8	Turkoman
UI8	Uzbek
UJ8	Tadzhik
UL7	Kazakh
UM8	Kirghiz
UO5	Moldavia
UP2	Lithuania
UQ2	Latvia
UR2	Estonia
V2	Antigua, Barbuda
V3	Belize
VE	Canada
VE1	Sablie Is.
VE1	St. Paul Is.
VK	Australia
VK	Lord Howe Is.
VK9	Willis Is.
VK9	Christmas Is.
VK9	Cocos-Keeling Is.
VK9	Mellish Reef
VK9	Norfolk Is.
VK0	Heard Is.
VK0	Macquarie Is.
VP2E	Anguilla
VP2K	St. Kitts. Nevis
VP2M	Montserrat
VP2V	Brit. Virgin Is.
VP5	Turks & Caicos Is.
VP8	Falkland Is.
VP2K	St. Kitts. Nevis
VP2M	Montserrat
VP2V	Brit. Virgin Is.
VP5	Turks & Caicos Is.
VP8	Falkland Is.
VP8	South Georgia Is.
VP8	South Orkney Is.
VP8	South Sandwich Is.
VP8	South Shetland Is.
VP9	Bermuda
VQ9	Chagos
VR6	Pitcairn Is.
VS5	Brunei
VS6	Hong Kong
VS9(See 8Q)	
VU	India
VU7	Andaman & Nicobar Is.
VU7	Laccadive Is.
XE	Mexico
XF4	Revilla Gigedo
XT	Upper Volta
XU	Kampuchea
XV	Vietnam
XW	Laos
XZ	Burma
YA	Afghanistan
YB	Indonesia
YI	Iraq
YJ	New Hebrides
YK	Syria
YN	Nicaragua
YO	Romania
YS	El Salvador
YU	Yugoslavia
YV	Venezuela
YV0	Aves Is.
Z2	Zimbabwe

Prefix	Country	
ZA	Albania	X
ZB	Gibraltar	
ZD7	St. Helena	
ZD8	Ascension Is.	
ZD9	Tristan da Cunha & Gough Is.	
ZF	Cayman Is.	
ZK1	So. Cook Is.	
ZK1	No. Cook Is.	
ZK2	Niue	
ZL	New Zealand	
ZL	Auckland & Campbell Is.	
ZL	Chatham Is.	
ZL	Kermadec Is.	
ZL5 (See CE9)		
ZM7	Tokelau Is.	
ZP	Paraguay	
ZS1-6 (H5,S4,S8,T4,V9)	South Aftrica	
ZS2	Prince Edward & Marion Is.	
ZS9	Wallvis Bay	
ZS3	(Namibia) S.W. Africa	
1A0	Sov. Mil. Order of Malta	
1S	Spratly Is.	
3A	Monaco	
3B6	Agalega & St. Brandon	
3B8	Mauritius	
3B9	Rodriquez Is.	
3C	Equatorial Guinea	
3C0	Annobon	
3D2	Conway Reef	
3D2	Rotuma	
3D2	Fiji Is.	
3D6	Swaziland	
3V	Tunisia	
3X	Rep. of Guinea	
3Y	Bouvet	
4J	M.V Is.	
4S	Sri Lanka	
4U	I.T.U.Geneva	
4U	Hdqtrs., United Nations	
4X	Israel	
5A	Libya	
5B	Cyprus	
5H	Tanzania	
5N	Nigeria	
5R	Malagasy Rep.	
5T	Mauritania	
5U	Niger	
5V	Togo	
5W	Western Samoa	
5X	Uganda	
5Z	Kenya	
T5	Somali	
6W	Senegal	
6Y	Jamaica	
7P	Lesotho	
7P	Lesotho	
7Q	Malawi	
7X	Algeria	
8P	Barbados	
8Q	Maldive Is.	
8R	Guyana	
9G	Ghana	
9H	Malta	
9J	Zambia	
9K	Kuwait	
9L	Sierra Leone	
9M2	West Malaysia	
9M6	East Malaysia	
9N	Nepal	
9Q	Zaire	
9U	Burundi	
0V	Singapore	
9X	Rwanda	
9Y	Trinidad & Tobago	

PLEASE return by March 31:
See page 20 for instructions!

Your CALL

Countries worked RTTY

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)

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

NEWS — NEWS — NEWS — NEWS Amateur Radio's Newspaper "WORLDRADIO." One year subscription is only $12.00. Contact: WORLDRADIO, P.O. BOX 189490, Sacremento, CA 95818

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

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FOR SALE - AEA ATU-1000 Deluxe Terminal Unit, in new condition, $595.00 OBO. See review in April 1988 RTTY Journal, pages 6 to 10. Call Paul, AD7I, (908) 834-1149, POB 205, Holmdel, NJ 07733-0205

WANTED: Back issues of RTTY JOURNAL, RTTY (Florida), ARTS (New York) and other teletype publications and a gasoline or diesel generator (50 to 100 Kilo-watt). Orville Magoon, K6DZN, Guenoc Winery, P.O. BOX 398, Middletown, CA 95461

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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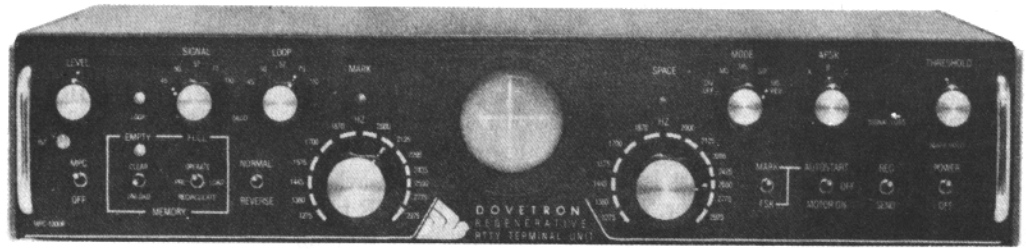

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Standard features include a high level loop supply and keyer (neutral or polar), EIA and MIL FSK outputs, a phase-continuous AFSK Tone Keyer with three selectable Mark - Space - Shift tone pairs, Mark, FSK & Digital Autostart, Automatic Markhold, an internal RY Generator for terminal unit Self-Test and circuit adjustment, and a Signal Loss Alarm circuit.

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