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NOVEMBER 1987

THE AWARDS TEAM

JAY, KE7PN AND BETSY, KE7PL
THE TOWNSENDS

THE RTTY JOURNAL AWARDS TEAM

IN THIS ISSUE

RTTY JOURNAL
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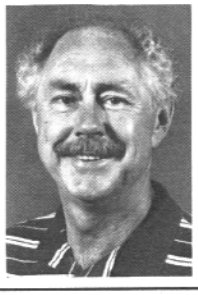
ABOUT THE COVER

I am pleased to present Jay, K27PN and Betsy, KE7PL Townsend who have consented to take over the RTTY Journal Awards program. It will take them a little time to get set up and the new certificates are not ready yet. So to those of you who are waiting, please be a bit more patient, we are almost ready to go. I think you will be pleasantly surprised when you receive your certificate. I welcome both Jay and Betsy to our staff of fine people all of which are working to make the RTTY Journal a better publication each month. I hope all of our readers will give them full support. Any correspondence about our awards should be sent directly to them . The address is: Jay Townsend, KE7PN, P.O. BOX 644 Spokane, WA.99210



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92708

HITS & MISSES

TYPOS

It seems that each month no matter how hard I try the Journal ends up with some typos. I got to thinking and wondering if other publications have the same trouble. So I began to watch carefully while reading other magazines and even the newspaper. Wow!, was I surprised at how many typos I picked up. Well after I found all of these errors in other publications I didn't feel so bad but still that is no excuse. I shall continue to strive to keep typos out of the Journal. The publishing software program I use to do the final composition of the pages does not have a spell checker and some of the typos creep in at that point. Hang in here with me, I'll beat it one of these days.

PUBLISHING

Putting out a twenty page publication doesn't take a lot of time but I wish I could say that of the cost. It seems every time I turn around someone wants to raise the price of something on me. The latest raise will probably come at the first of the year when I understand that the Postal Service is going to raise the cost of some mail service. I don't think it will affect our second class mailing status but it will probably cause a jump in the cost of first class mailing. This means that the cost of our out of country mailing is going to go up. It also means I will have to pass along these increases to our out of country readers. I wish I didn't have to raise these out of country prices but they have been on the borderline for some time now. It was only a matter of time before I would have had to make the increase. So to our out of country readers please be aware that your subscription costs our going to be increased some time in the near future. I will wait until the last minute so that I can be as fair as possible. You may suggest that I go back to sixteen pages to cut costs. **(cont. pg. 16)**

Roy Gould, KT1N
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Stow, MA. 01775

DX - NEWS

HD8CQ and the RTTY Contest

Wow, what a time, that a contest. We were made so at home by our friends from the Guayaquill and Quito Radio Clubs on the mainland and then on our arrival on San Cristobal Island by the Galapagos DX Club. It is a great Hobby. This was the first time I have ever seen the other end of a pileup and it was really an experience. We had a lot of fun bringing you hopefully a new one on RTTY. Ted, HC5K, Hal, WA7EGA, Jay, KE7PN and Betsy, KE7PL deserve a great deal of thanks for pulling the trip together, and as Hal pointed out last month, had all of the work done before I got there. Next time you hear them on say TNX.

We made over 6,000 QSO's on SSB and CW before the contest and 1,222 RTTY QSO's in the contest. Our score was over 1.4 million points! The QSL card is a beautiful full color card taken by Hal, WA7EGA, it is now at the printers and should be out in the mail by the end of the month. Over 2,500 cards have already been received direct by me. The RTTY ones are set aside and have already been checked against the log and I will get on those as soon as possible.

I would also like to thank Dale for all the kind words about me in his column last month. I really appreciate it, but I would like to share with you that a good friend also deserves a lot of credit. That person is George, W1DA, who is always there when I want to bounce an idea off him whether it be running the rules of the CQ/RTTY Journal Contest by him for a sanity check and his inputs, or to just get his opinion on something. Thanks George. He likes to stay in the background most of the time, but if you are a new DX station on RTTY, you can be sure George will be there among the first, if not the first, to catch you.

MAILBOX

Received a nice letter from Ed Burns, W3EKT, who points out the fact of how soon we forget. Ed has not been to active of late, what with a new job, a move, coaching a soccer team, etc. etc. Ed found interest in a recent column about the RTTY WORLD CHAMPION concept wherein I mentioned the issue as proposed by Luc, I2OLW. Ed sent me some info about the award which in 1974 was administered by I4CLF. In that year Ed, W3EKT won the Championship just beating his good friend Mike, K4GMH. Mike and Ed worked together then and shared there common love of RTTY DX, but after Mike moved to Florida, Ed says it wasn't quite the same. In 1985 Ed took part in the BARTG placing 7th but has not been to active since. Ed's first BARTG was in 1973 when he placed 29th. Between 1973 and 1985 he has been in most of them winning in 1981 and 1982. Sure would like to see you back on the keys again Ed. I first met Ed in the old RTTY Journal contest which was held in February. In 1984 I felt for sure I had won the contest, Dee (former Journal publisher) told me she would have the results at Dayton that April. I was planning to go to Dayton, so was excited about receiving the 1st place certificate there and also meeting Dee. Well come time of the announcement and she calls out Ed's name as the 1st place winner and me as 2nd place. That is when I met Ed for the first time because during the contest I did not hear him due to our close proximity for 20 meter operation. So you see, you never know who wins until it's over. Oh yes Ed, during the contest and still today, runs all Mechanical gear! Here I was running all these computers, hitting a button here or there and Ed was doing it all the real "Steam RTTY" way. A real great operator and a person that I enjoyed meeting and chatting with into the wee hours that year at Dayton. Come on back Ed, the bands are starting to get better every day.

MAILBAG

The mailbag also had a nice note from Crawford MacKeand, WA3ZKZ. He writes after an absence he got back on the keys during the CQ/RTTY Journal contest and gave out the rare state of Delaware to many of the gang. It was good to renew many old acquaintances from the mechanical days, he said. Crawford worked 8R1RPN, CO2BB, CX7BBY, CE0ZIJ all on 15 meters for new ones. And yes Crawford, CE0ZIJ is on Easter Island and not Juan Fernandez. he also passes along that the level of activity was tremendous from his location on all bands, especially on 40! Brought back memories of the old days he adds.

Well Crawford, thank you for the letter and kind comments on the contest and our operation from HD8CQ. Hope to hear you on more often and especially in the contests.

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(DX NEWS cont from pg. 3)

Also a letter from Bob, WA9AKT. He writes that in addition to working us from Galapagos, which was a new one for him on the keys, he has also added to his RTTY DXCC which as of October 12 stood at 98 countries worked. Bob is also excited about his daughter Amie, who now has her ticket with the call of KA9WLJ. So now his air time will have to be shared. Now you're in trouble Bob, you will have to make an appointment to use the rig. We hope to work Amie one of these days soon. Well those next 2 new ones will be difficult to get Bob, but then right after that, you will probably work 10 more new ones easily hi hi. Tnx for your letter and good luck to Amie.

RTTY NEWS

Tom, VE7VP, our watcher of the AMTOR frequencies, writes that conditions have been very poor from his location the last few months. Just recently he has begun to hear Europe come chirping through. However, he did manage to work a few new ones. These include ZK1CG and 6Y5MC. Of course, Tom worked some common stuff during the past few months that were not NEW to him, these included YC7DB, HL1AV, VS6TU, YB5QZ, 9M2OK, ALL ON AMTOR. So as you can see there is some good DX on this mode, don't forget to check the AMTOR frequencies 14.075, 21,075. Thanks Tom for your report. By the way, Tom has 68 countries worked on AMTOR as of the 1st of October.

A22BW, Botswana is very active on both 15 and 20 meters.

BV0RY, from Taiwan will be the call used for a RTTY DXpedition November 27-30. The group will listen for RTTY from 0000 - 1400 UTC each day on 20 meters. This is a JA group and QSL's go to JG1RVN.

HK0, San Andres Islands, is also planned to be activated by N3JT during and after the WAE RTTY contest. QSL via N3JT.

S7WS has been active on 14.090 at about 1300 UTC. This is Walter, DJ6QT, and if you work him, QSL via his CBA.

A71BJ, has been worked in Europe on 31 October, 1740 UTC on 14 Mhz.

9J2HD, also heard in Europe on 1 November 14 Mhz. This is a new station to RTTY and we have no other info at this time.

Oman A4, to celebrate the 15th anniversary of the Omanian Radio Society, all A4 stations will be on from November 5-8 on all modes. Hope you got this one if you need it. Sorry the info is so late but just received it here.

QSL HELP

George, W1DA is looking for help on getting a QSL card from AZ1A (as am I). The recommended route has not worked 3 times for George. He is also looking for a Direct Address for Z21FB, the 1987 CBA is not correct.

CQ RTTY WAZ AWARDS

The first awards for CQ RTTY Worked All Zones have been awarded. They are as Follows: ALL BAND - 1) F8XT 2) TG9VT 3) DK3CU 4) JA1ACB. 14 Mhz - 1) JR2CFD 2) I5FLN 3) TG9VT
Congratulations to all, there are still some 1st place monobanders available.

Also in the mail was a note from Ron, ZL1AMO. Ron is planning a DXpedition to Auckland/Campbell Islands for 2 weeks in February 1988. His note says all bands SSB and CW and he is looking for donations to defray expenses. I sent Ron back a note requesting that he take along RTTY gear. I have not heard from him yet, but will share any news with you when it comes in. It would help also if many of us would drop Ron a line encouraging him to get on RTTY. Hopefully, that will help him make up his mind. His address is: Ron W. Wright, 28 Chorley Ave., Auckland 8, New Zealand.

To our stateside readers, a Happy Thanksgiving, and to all our readers I hope you got all that antenna work done you had planned on doing before winter sets in. See you all next month. Thanks and a tip of the DX hat to TG9VT, W3EKT, ZL1AMO, WA3ZKZ, WA9AKT, VE7VP and the DX Bulletin.

de Roy, KT1N

TELL YOUR FRIENDS ABOUT THE RTTY JOURNAL, THEN THEY WILL HAVE THEIR OWN COPY AND NO LONGER HAVE TO BORROW YOURS. AT ONLY TEN DOLLARS A YEAR (USA) THEY'LL BE PAYING ONLY FIVE CENTS PER PAGE FOR DIGITAL INFORMATION NOT AVAILABLE IN ANY OTHER MAGAZINE.

Hal Blegen, WA7EGA
12910 E. Broadway
Spokane, WA. 99216

CONTESTING

W3EKT dropped me a line the other day talking about contest burnout. Many of you will remember Ed as a really big-time RTTY contest winner in the late 70's and early 80's. In fact he won the BARTG single-op two consecutive years-- '81 and '82 and took the CARTG in both '74 and '77. Ed reminded me of some of the all time RTTY contest guys like K4HJC, W3FV and K7BV with whom I used to tango every contest weekend, (Mac, K7BV always beat the pants off of me from Arizona).

Maybe Ed is right. The job of keeping a station in top competitive condition (which becomes more demanding as the solar cycle peaks) can be full-time. generating the enthusiasm needed to carry through the second 24 hours when your back aches, your eyes are full of sand and the rate is four an hour can be even tougher. The final sack could be a move which leaves years of antenna building on the ground with most of it too bulky to move or not practical at the new QTH. Maybe it has to do with goals that have been achieved although I can't imagine being first in the world often enough to get bored with it. For whatever reason, Ed seems to be right. The ones who were winning contests ten years ago who are still winning are like the "old, bold grizzly-bear hunters", that is to say, sorta rare. As I glanced over the BARTG results for the two years that Ed won, I was surprised and a little disappointed.

In 1980 a lot of us were still pounding mechanical keyboards. The serious folk had UT-4's to clean up tape/keyboard distortion and to improve receive range and a very few were running computers which in 1980 dollars represented a sizeable investment! The least expensive system currently does as good a job as what the winners were using in 1980. Low-distortion, computer-generated pulses on transmit make DX easier to copy on shakey, polar paths and buffers have eliminated most of the drudgery including most of the typing. Finally, judging by the new calls showing up on the band each week, the number of stations with RTTY capability has to be higher than it was in 1980, especially the DX. From that viewpoint, I expected bigger scores and especially more QSO's in 1987 than in 1980.

In the two years that W3EKT won the BARTG, he was logging about 380 QSO's. His winning total in 1982 was 228K. This spring, KT1N's score was only 10K higher.

Sure, the sun-spot cycle plays a part but the key, I think, is participation. Inspite of the advantages available to contemporary RTTY contender, we still aren't getting the turnout for most contests.

On the subject of turnout, CW is a tough mode. The 30 WPM needed for effective contesting is not a common attribute. A good ear for the pileups and the iron will to fight the QRM for hours isn't all that easy to find either. In 1986 there were over 400 single-op logs received for WAE CW. There were only 61 single-ops willing to lick stamps for their WAE RTTY logs of which only 8 were North Americans. In 1980 and 1981 and average of 123 BARTG single-ops entered their logs. In the BARTG single-op category for 1986 there were only 75 logs received. It jumped to 108 in 1987 but that's still far below potential!

The RTTY Journal/ CQ Magazine contest this year should show some positive results. It had effective publicity, support by the DX, and some pre-contest enthusiasm shown on the band. it will be interesting to see how many logs show up between now and the DEC 1st deadline (CQ RTTY CONTEST, 76 N. BROADWAY, HICKSVILLE, NY. 11801 U.S.A.).

If you're reading this, chances are I'm preaching to the already converted. It's the other guy we need. You even worked him! It was Sunday morning on the 2nd day of the contest. Although you were 50 Q's behind the competition, the rate was improving and Europe was opening up when the guy answered your "CQ CONTEST". He was 10 over 9 so all you sent was his call and a quick, "203-599-1443". He came back with 2 lines of RY's, gave his name, his QTH, a weather report and asked, "WHAT CONTEST IS THIS?".

How did you handle that? What did he think of the contest when you were finished? What are the odds of him ever being interested in participating in a future contest?

How many stations do you hear on the band in the two weeks prior to a contest talking to

(cont. pg. 6)

(CONTESTING cont. from pg. 5)
folks about the coming contest? If somebody wants the rules to the contest, do you have them handy ... like in a buffer or do you know what page in the Journal, CQ or QST or even which issue they were printed in?

If you read the rules, all contests contain an angle of some sort which allows you to compete with some expectation of winning. NO EXCEPTIONS. There are band classes, transmitter classes, states, call areas, 80 meter QRP VE's -- the list goes on and it's a little different for each contest but there is always a way to get a fair shot at the wallpaper. Granted, you don't turn a fellow who hates all contests into a white-knuckled, red-eyed, 20-meter rateman just by sending him the rules of the contest but its a start!

The final test for this year is the WAE on the 2nd weekend of November. The rules were in last months Journal. If you folks on the East Coast can't show us Westcoasters how to work Europe, you're just not trying. Jay, KE7PN and I will be looking for you --- and trying our best to best you!

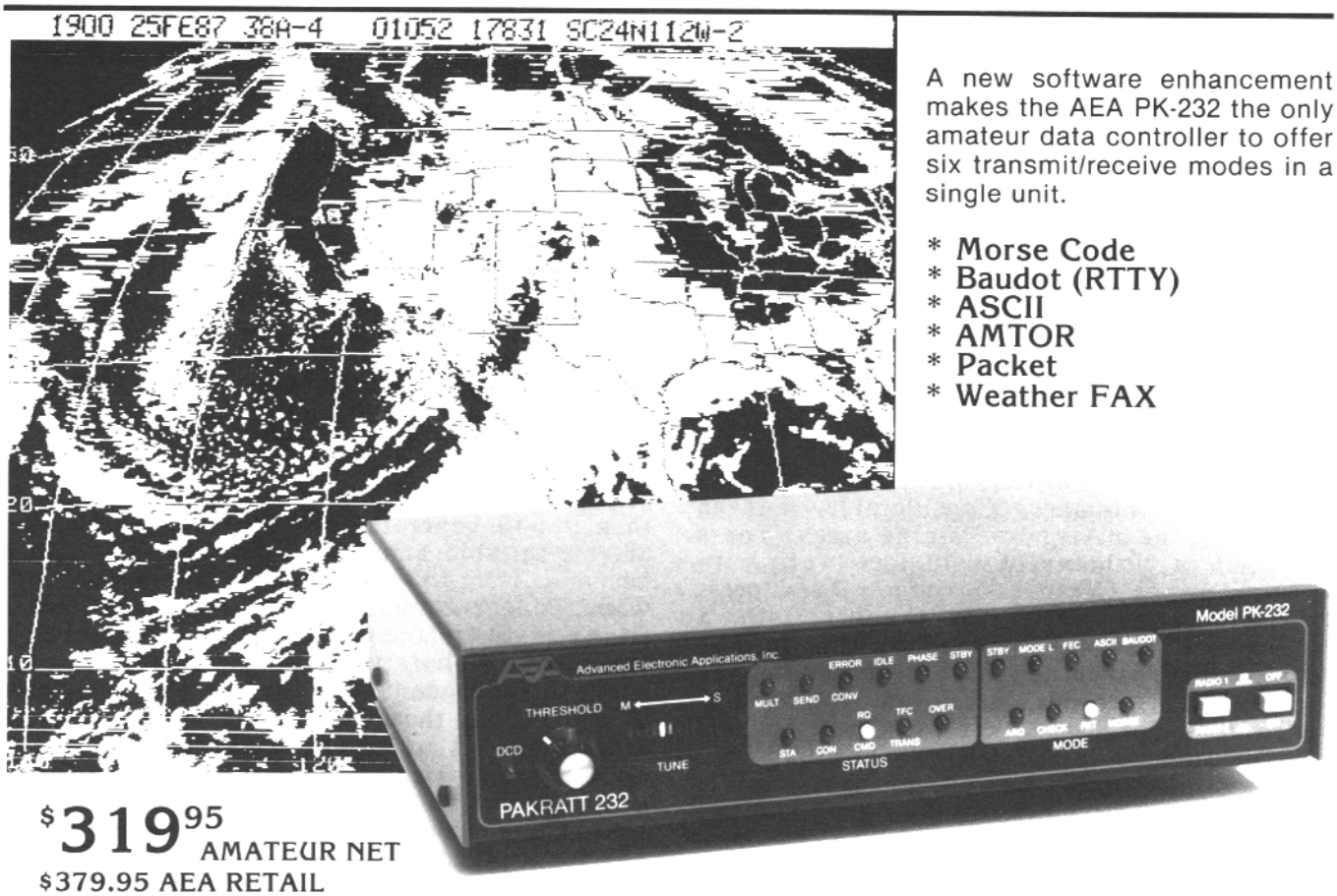
Next month I'll talk about ways to promote a few COZY DEALS into big points and discuss some tips on ways to improve rate. See you on the band. **de Hal, WA7EGA**

RTTY BANDPASS

CALL	FREQ	TIME	DATE
4K1LPK	14.097	0500	17 SEP
4S7/DEF9FA	14.097	0005	6 SEP
4U1UN	14.087	2340	8 SEP
5L2X	14.085	2230	7 SEP
9M2AX	14.084	1625	4 SEP
CN8EL	14.092	2220	5 SEP
C31SD	14.081	2030	5 SEP
FP5DF	14.092	2200	21 AUG
FT8ZA	14.087	1215	7 SEP
JD1/KA2IJ	14.078	0450	8 SEP
TU2AA	14.086	1930	6 SEP
TR8JLD	21.095	2020	8 SEP
VU2IJ	14.092	0215	10 SEP
ZL7DE	14.092	0420	5 SEP
A22BW	14.084	1240	1 NOV
FG5UQ/FS	14.097	1155	28 OCT
FT8ZA	21.079	1217	1 NOV
OY6FRA	14.085	1205	30 OCT
S79WS	21.088	1205	1 NOV
	14.090	1310	28 OCT
UB0QQ	14.086	1209	31 OCT
UZ4FWD	14.081	1150	31 OCT
VK6PM	14.083	1225	29 OCT
V31AE	14.079 ARQ	1300	31 OCT
6W6JX	14.091	2335	24 OCT

New PK-232 Breakthrough

Six Digital Modes - Including Weather FAX



A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit.

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Your home computer (or even a simple terminal) can be used for radio data communication in six different modes. Any RS-232 compatible computer or terminal can be connected directly to the PK-232, which interfaces with your transceiver. The only program needed is a simple terminal program, like those used with telephone modems, allowing the computer to be used as a data terminal. All signal processing, protocol, and decoding software is in ROM in the PK-232.

The PK-232 also includes a no compromise VHF/HF/CW modem with an eight pole bandpass filter, four pole discriminator, and 5 pole post detection low pass filter. Experienced HF Packeteers are reporting the PK-232 to have the best Packet modem available.

Operation of the PK-232 is a breeze, with twenty-one front panel indicators for constant status and mode indication. The 240 page manual includes a "quick start" section for easy connection and complete documentation including schematics. Two identical back panel radio ports mean either your VHF or HF radio can be selected with a front panel switch. Other back panel connections include external modem disconnect, FSK and Scope Outputs, CW keying jacks, and RS-232 terminal interface.

The RS-232 connector is also used for attaching any Epson graphics compatible parallel printer for printing Weather Fax. Weather maps and satellite photos, like the one in this ad, can be printed in your shack.

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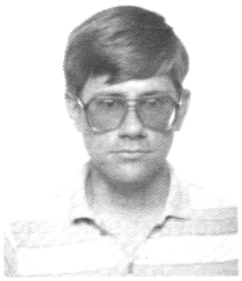


Richard E. Polivka, N6NKO
18943 Vickie Ave. #34
Cerritos Ca. 90701

PACKET

It is now Pumpkin Pie and turkey time. Everyone is going through the change in seasons everywhere. In the Northern Hemisphere, the summer static is dissipating so the lower bands will be more usable and speaking of usable, lets get digital.

LITTLE BIG ONE

On October 1st, Whittier, California was hit with a 6.1 earthquake. Considerable damage was done in the city and adjoining areas. Yours truly put in 10 hours of volunteer work with the Los Angeles County Sheriff's Department the day of the quake. On October 14th, a practice drill was held for the express purpose of training all concerned on how to handle the communications needs after an earthquake. The running joke was that we had the real thing for practice of the drill. For the drill, two packet links were set up to pass traffic between headquarters and two communications sites. Everything for the most part went fine. In critiquing the drill, it was said that a BBS would work better than direct connection to speed traffic. I do not agree. BBS's only support one connection at one time and it can lead to confrontation when it comes to connecting to the BBS to send and receive traffic. If you are running a star shaped system where all the traffic is filtered to and from a central point, that station should have software that can handle multiple receive connects and store the received information into the proper disk file. When the station disconnects, the file is sent to a print spooler to be printed. Meanwhile, traffic can be passed out at the same time by the same station. As far as I know, there is no software out on the market to support this kind of operation. It would be great if some was written for the public domain. Software of that type would make handling the traffic much smoother. There are estimates that there will be generated approximately thirty million (!) pieces of traffic to be handled within and out of the area. It will end up taxing the whole country in terms of passing traffic so we had better bone up on our skills in handling traffic by checking into a net when time allows.

CHANGES TO AX.25?

Phil Karn, KA9Q, has made several suggestions to improve the handling of packet traffic by the TNC's by improving the capacity of the channel. Here is a partial listing of what he is suggesting:

1) Setting MAXFRAME to a permanent value of 1. The reason behind this is that instead of sending several packets at once, it would allow for faster error recovery if something happens to corrupt the data on the channel such as a collision, static, etc.

2) Eliminating the DWAIT timer and switching to a biased, random selection of when to transmit after the channel is cleared. This is called "p-persistence". I know that the AEA PK-232 will support this feature already. What happens is that when the channel quiets, the TNC generates a random number between 0 and 255. If the number is high of a pivot setting number, the unit will not transmit and then it will generate another random number after a settable amount of time. If the channel becomes busy during this time, the unit will wait for the channel to quiet down before trying again. If the generated number is below the pivot value, the TNC will start up the transmit sequence.

3) Increasing the transmitted packet length from 256 bytes to 1024 or even larger. This will allow for a greater amount of information transfer in a given transmission without having to incorporate all of the packet header and trailer information.

4) Elimination of the "POLL/FINAL recovery" system on short length packets. Again, this is to reduce the overhead on the channel.

5) Having the FRACK time dynamically updated based upon round trip time on the channel. The updating would be done using a smoothed average of the total time it takes for the sending TNC to get an ACK or NAK back from the receiving TNC. That way, the sending TNC will not burden the channel with useless retries.

6) Elimination of the RESPTIME timer. This can be done because of the limit of one transmitted packet outstanding as proposed above.

I do agree with the suggestions that were made by Phil. By eliminating overhead, the channel can handle more transmitted information thereby making packet more efficient.

GRUNGE

One of the problems of using digital equipment whether it be a calculator or a computer, digital devices are great producers of RFI. **(cont. pg 9)**

(PACKET cont. from pg. 8)

I know that the TNC I am using spills out RFI with only the power lead hooked up and the radio I use manages to pick up the hash via the antenna that is about 25 feet away. It can be a problem when it comes to receiving weak packets. I have the cables going to and from the terminal and the TNC coiled up to help confine the RFI.

I have not been totally successful with that route but it has helped greatly. When I get the time and inclination, I am going to use a liberal amount of ferrite beads on all the leads going to and from the terminal and TNC. There is only so much that can be done to eliminate the hash that is there. The glass tube used for display can leak large amounts of RFI. However, there are glare screens made to help eliminate this problem.

TCP/IP

TCP/IP which stands for Transmission Control Protocol / Internet Protocol. This is a set of communications structures that allow large amounts of computers to exchange information between themselves. The system was developed in its early stages by the Advanced Research Programs Agency (ARPA). Because of this, it has been referred to sometimes as ARPANET. The system is presently being used on PC's and is still in the developmental stage. All you need to run it is a TNC that will run in the KISS format, a PC with at least 512K of memory space and LOTS of disk space to hold all of the program and subsequent data files. For people who read the ISO specifications, they will find that TCP/IP supports ALL layers. I mentioned earlier in this column that I was looking for a program to do multiple data file interconnects at once, this may just fill the bill. More on this next month.

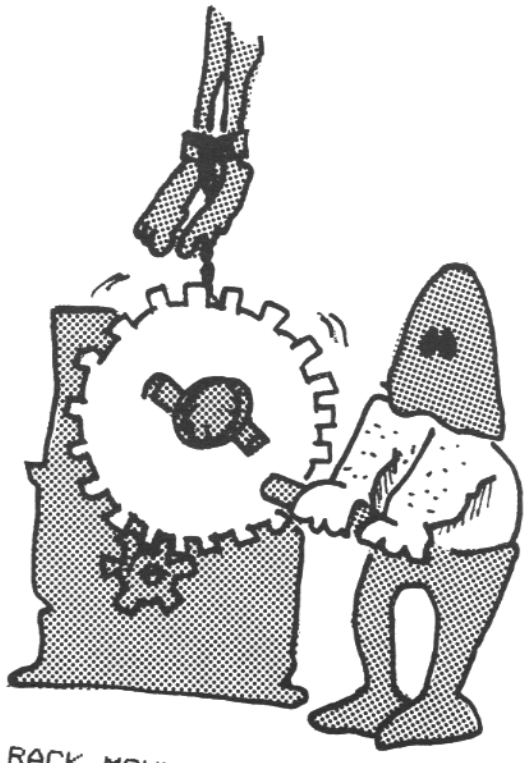
NETROM UPDATES

A new revision to the NET/ROM software has been released and is tagged as revision 1.3. It will now support the use of a CQ by storing the request in the destination NET/ROM system for a few minutes. All a user has to do is log onto the node and type the USERS command to get a list. Then all they have to do is issue a connect to that call and the NET/ROM takes care of the rest. There has also been included p-persistence instead of the DWAIT timer. The NODES command now offers the list sorted by NET/ROM alias. And also there has been a feature to reduce the channel loading and that is the node will identify itself only if it has been used within the 9 minute 59 second window. If it hasn't been used sometime in that window since the last ID, then it will not.

UNTIL NEXT MONTH

This month's column is short for a couple of reasons, OT at work, a vicious flu bug that drained all of my energy and I am still recovering from it. Besides, I am going to give the typesetter's fingers a rest from last month, hi hi. Next month, there will be another installment of the BEGINEER'S CORNER and more news from and about the GROWING world of Packet communications. If you want to send any news, tidbits, questions, for me to incorporate into the column, please send them by mail or, to save 22 cents for a stamp, use the packet network. My home PBBS is WB6YMH-2 on the WESTNET- .05 system. Just address it to N6NKO. Well, until next month, "in all things, moderation". Happy Thanksgiving in the USA and rejoice that we as amateurs can talk to just about anyone and not have to worry about politics. Amateur Radio- One Worldwide Family.

de Richard, N6NKO



RACK MOUNTED GEAR

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- 400 to 4000 Hz
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- 10 to 1200 Baud
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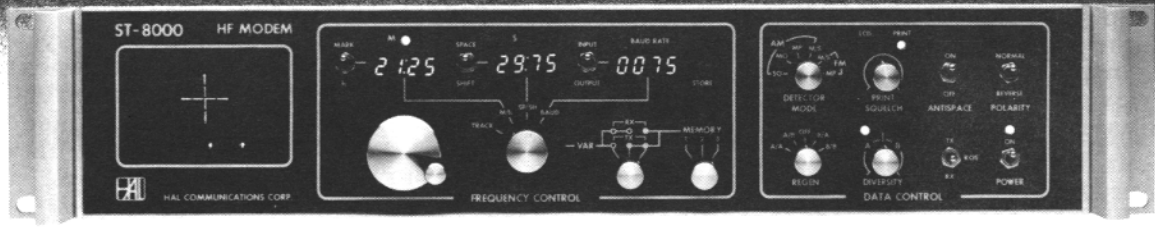

ST-8000 HF Modem

Real HF radio teleprinter signals exhibit heavy fading and distortion, requirements that cannot be measured by standard constant amplitude BER and distortion test procedures. In designing the ST-8000, HAL has gone the extra step beyond traditional test and design. Our noise floor is at -65 dBm, not at -30 dBm as on other units, an extra 35 dB gain margin to handle fading. Filters in the ST-8000 are all of linear-phase design to give minimum pulse distortion, not sharp-skirted filters with high phase distortion. All signal processing is done at the input tone frequency; heterodyning is NOT used. This avoids distortion due to frequency conversion or introduced by abnormally high or low filter Q's. Bandwidths of the input, Mark/Space channels, and post-detection filters are all computed and set for the baud rate you select, from 10 to 1200 baud. Other standard features of the ST-8000 include:

- 8 Programmable Memories
- Set frequencies in 1 Hz steps
- Adjustable Print Squelch
- Phase-continuous TX Tones
- Split or Transceive TX/RX
- CRT Tuning Indicator
- RS-232C, MIL-188C, or TTL Data
- 8, 600, or 10K Audio Input
- Signal Regeneration
- Variable Threshold Diversity
- RS-232 Remote Control I/O
- 100-130/200-250 VAC, 44-440 Hz
- AM or FM Signal Processing
- 32 steps of M/S filter BW
- Mark or Space-Only Detection
- Digital Multipath Correction
- FDX or HDX with Echo
- Spectra-Tune and X-Y Display
- Transmitter PTT Relay
- 8 or 600 Ohm Audio Output
- Code and Speed Conversion
- Signal Amplitude Squelch
- Receive Clock Recovery
- 3.5" High Rack Mounting

Write or call for complete ST-8000 specifications.

HAL Communications Corp.
Government Products Division
Post Office Box 365
Urbana, Illinois 61801
(217) 367-7373 TWX 910-245-0784

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

MSO'S

Where has summer gone? It seems like I spend half of my time either putting storm windows up, or taking them down! And, with the imminent arrival of Ol' Man Winter, it's time again for us to at least take a peek at our antennas, feedlines, rotor cables, etc., so that we aren't out in sub-zero weather trying to put things right! summer thunderstorms seem to have a way of loosening things up, corroding rotor cable connections, and stressing antenna elements, so a few minutes spent now may save a chilling experience in December! Borrow "Junior's binoculars, and check things out.

SAD NEWS DEPARTMENT

It is with deep regret and sadness that I report that Ethel Johnson, XYL of Ernie, W6ZRR, (MOS SYSOP on the National Autostart Frequency), passed away on October 16, 1987, after a long illness. Ernie and Ethel had been married for 60 years this past December, a most fitting tribute to two wonderful persons. They were, of course, very devoted to each other, and I know that we all share in Ernie's loss. Our most sincerest condolences to Ernie and his family in this troubled time.

GOOD NEWS DEPARTMENT

I'm a happy to report that Tandy, K4YSN, has re-joined us on the National Autostart Frequency, after an absence caused by some serious back surgery. Tandy is making good progress in his recuperation, and although not fully recovered at this time, he is doing well. For those you who may not be familiar with Tandy and his RTTY operations, it may seem difficult for us at times to fight the QRM, poor band conditions, etc., but what if you were sightless? That's right, Tandy is blind, yet he operates RTTY just like the best of us, including taking advantage of the various MSO's and CBMS's (computer based mailbox systems). Tandy is presently using a IBM clone computer, a AEA PK-232, and a device that converts ASCII to voice. To see him zip through the various RTTY mailboxes with ease, makes many of us envious of his sophisticated operation! It's good to see you back Tandy!

KENTUCKY/MIDWEST RTTY NET

Larry Workman, KA0JRQ, has asked me to remind everyone that the Kentucky/Midwest RTTY Net, (KMRMN), will change both their net time, and operating frequency, with the change back to Standard Time, from Daylight Savings Time. The new time will be at 0130 UTC, on 3630 Khz. One and all are encouraged to check in, for some good experience and the "Round Table" comment period. No RTTY traffic is needed, just check in with your name and QTH.

And speaking of Larry, he has one of the slickest RTTY MSO/Packet BBS systems going! Larry uses the HAL MPT-3100 for HF RTTY MSO activities on the National Autostart Frequency, (14 085 625) and the HAL RMX-3100 "Multiplex Switch" to allow access to his VHF Packet system simultaneously. Keep up the good work Larry!

"ESMERALDA" SURFACES

Yes, believe it or not, "Esmeralda" is alive and well, and in South Dakota no less! Who the heck is "Esmeralda" you say? "Esmeralda" is a favorite travelling companion of Dee Crumpton, N6ELP, and John Goheen, KA6NYK, their ever-faithful motorhome. I was very pleasantly surprised when Dee called me about three weeks ago, to tell me that she and John were visiting the beautiful Black Hills, and staying at "Hart Ranch", a very beautiful motorhome park, about 20 miles south of Rapid City. My XYL (Alta) and I hastily jumped on our Gold Wing, rode down to Hart Ranch, and had a very nice visit with Dee and John. They are having the time of their lives, seeing all of America and Canada, and wanted me to pass on their greetings to all of their RTTY friends world-wide. they were headed for the northwest portion of the United States from South Dakota, and should back in southern California by the time the snow flies.

HELP IN LEARNING MSO PROTOCOL

I think there are times when some of us are a bit timid in using some of the sophisticated systems available to Amateur Radio Operators these days, primarily due to the feeling that we don't know how to operate them. I'd like to take this opportunity to point out several files that are available to those who would like to learn to use the MSO's and CBMS's on the National Autostart Frequency. Two excellent files written by Joe, AJ0X, Laurel, MS, are called MSO NEWCOMER-1, **(cont. pg. 12)**

(MSOs' cont. from pg. 11)
and MSO NEWCOMER-2, and they can be found in both the K4KOZ and the WB8ICL/WB8JIB MSO's. These files are written in "Eighth Grade English", and do an excellent job of providing the "ins and outs" of MSO operations. Additionally, each MSO has its own individual "HELP" command, which will provide a comprehensive list of MSO operating commands. So guys and gals, don't be afraid to get your feet wet in MSO activities, as we were all novices in this type of activity at one time, and there's no better time for you to start.

MSO RAMBLINGS

Did you miss copying the W1AW RTTY bulletins direct from W1AW? You can always find the current bulletins in the WB8ICL and K5FL MSO's on the National Autostart Frequency.

--- Congratulations go out to John, TG9VT, (MSO SYSOP), who is one of the very first to qualify for "Worked All Zones" on RTTY. A very worthy accomplishment, in which John has spent a lot of time and effort.

--- Interested in VHF RTTY and MSO activities in the Dallas, Texas area? Contact Brownie, K5FL via his HAL MSO on the National Autostart Frequency, or give him a call at his Denton, Tx. QTH. Brownie presently is also operating a VHF MSO in the Dallas area, utilizing an IBM clone computer, and the very popular W9CD MSO software. (W9CD's MOS software can also be observed in action on the W6ZRR MSO, San Luis Obispo, Ca. and the WB8ICL MSO, Yellow Springs, Oh.).

--- Larry, KA0JRQ, has all of the inside information on installation and operation of the HAL RMX-3100 Multiplex Switch. If you're thinking of utilizing one of these units, Larry can provide a wealth of data. Contact him via his MSO on the National Autostart Frequency.

Happy Thanksgiving to one and all, and drop me a line whenever you have something of interest for the MSO Column.

73 de Dick, K0VKH

Wolfgang Punjer, DL8VX
DAFG Contest Committee

Ray Hunter, VE3UR is a real avid RTTY operator as witnessed by the gear he has in his home shown in the pictures below. I'm sure many of you have worked Ray for a Rag Chewing session or in a contest. We envy your station Ray.

RAY HUNTER, VE3UR
stations #1 and #2

Station one: Drake R7, TR7, L7, MN2700, TONO EXL 5000, 20" Sony monitor.
Station two: Collins KWM 380, TONO 777, program in Pacal by VE3BKB, IBM dual drive, 26" Zenith monitor.

Station #3 upstairs
& GO - GO

Station three upstairs in living room: FT-757, Auto Tuner, SX64 Computer, CP-1 W/MBA TOR, 12' monitor. Assistant Operator is GO-GO a Netherland Dwarf rabbit.

19???

1987

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

CONNECTIONS

WE HAVE MAIL

"Pete" Hoover, W6ZH, was kind enough to send in several hints. One is for the Commodore crowd who use the AEA Com Pakratt program with their C128/C64 and the PK232 digital controller. Pete had an intermittent problem with the RS-232 connector that comes with the Com Pakratt program. Actually it is not the connector so much as it is the lack of a connector-to-computer fastener system on the computer. As Commodore owners know, the "User Port" on the Commodore is an extension of the pc board and is really just a card edge connector. Anything you plug into this port is held there only by the friction of the connector contacts. When you connect an RS232 cable to this connector, the combined weight, especially in the C128, causes the connector/cable assembly to droop down enough to strain the connector-to-edge-finger contact and may cause an intermittent connection. Now, after all that description, it turns out the solution is quite simple. Just slide a wedge of styrofoam or other insulating material under the RS232 connector/cable assembly behind the computer to keep the assembly level with the desk. Presto! - no more intermittents.

Item 2 from Pete notes that he had problems getting the PK232/Yaesu FT-901 combination in an AFSK mode to emit a stable signal. He solved this stability problem by going to the FSK mode (the FT-901 does have a separate FSK connection for RTTY). Now the signal is rock-solid. Anyone know why the AFSK mode of operation with this combo is unstable?

Item 3 was a data sheet on a MAXIM MAX232 integrated circuit chip that will act as a RS232 transmitter/receiver (which requires plus and minus voltages on the transmitter [driver] side). The noteworthy feature of this device is that it works with only a plus 5-volt power connection. It generates its own plus and minus 10 volt driver-side voltages. The only external components needed are four 22 ufd, 10 volt mini electrolytics and a couple of resistors. That sure beats having to come up with an external plus/minus power supply when you need an RS232 driver/receiver. The MAX232 should be available from some of the larger electronic component distributors. With any luck, perhaps mail order firms like Jameco and others will start stocking these chips. The 16-pin chip contains two RS232 line receivers logically similar to the MC1489A. It also contains two RS232 line drivers similar to the MC1488. This Maxim chip has been out for about a year, but I never thought about describing it until Pete sent in the data sheet. Thanks, Pete, for sharing all the good information.

CONNECTING A COMPUTER TO THE ICOM IC-751 TRANSCEIVER.

About four years ago, ICOM announced the IC-751 HF all-band transceiver. I scratched around and managed to come up with the wherewithal to purchase this gem, mainly because the advertisement said that a computer interface accessory would be made available. Now, mind you, this was no small sum, and this was before the Yen started to climb. At any rate, I patiently (?) waited for a year and still no computer interface. Then the ads stopped mentioning the computer interface. That's when I called Bellevue and found out they were not going to market a computer interface! Hell hath no fury like a Ham who has just found out he has been taken. Life for ICOM reps at Hamfests and conventions became instant misery the moment W6OXP showed up.

This year I went to the Southwestern Division ARRL Convention in Scottsdale, Arizona and had a marvelous time. However, I noticed when I walked up to the ICOM exhibit, the Sales rep did not cringe; instead, he smiled. After I asked the usual question, he said "UX-14". "What's that?" I said. And find that the UX-14 is a serial computer interface adapter for the IC-751, 751A, R7000, etc. Something that is called the "CI V bus system". Due out next week. Write it down, more smiles all around. Return to Southern California. Call the local ham emporium and asked them to call when the unit arrives.

Unit arrives the following week. Tiny box holding tinier PC board with one large chip and a couple of small flat cables. Jaw drops after being told it is going to cost me $72.

(Cont. pg. 14)

(Connections cont. from pg. 13)
Swallow hard and fork it over. Go home and read book. Strange - no RS232 connector for serial interface. Tiny PC board mounts inside IC-751 and output is coax cable with tiny phone jack mounted on rear panel. Read book some more. Jaw drops again! - discover need level converter called CT-17 to actually make connection to RS232 port on host computer. Block diagram shows UX-14 inside transceiver with output coax going to external CT-17 level converter which in turn is connected to host computer. Wonder why the ICOM rep didn't mention this. Call ham store - they don't have it. Supposed to come in next week or week after. How much for this one? Short silence, then "about 97 dollars". Dead silence - jaw can't drop any further, can't even talk, just gurgles and squeaks. Finally, "ahh, thanks, let me know when it comes in, I want to take a look at it". So help me Oliver Heaviside, it had better have an RS-232 connector on it!

Now I know why the ICOM Sales Rep was showing all those teeth when he smiled, because I am sure he was thinking "revenge at last!". Brings to mind inscription on local bumper stickers "Don't get mad - Get even". Well, now it's my turn! Seriously, I suspect this radio game is getting like the automobile sales game. To wit: negotiate on the price of the car but make it up on the accessories. Almost makes one wish that computers hadn't been invented.

So far, we have only been talking about hardware to enable the connection between the transceiver and the host computer. We still need some software to allow the computer to send commands to the transceiver such as "change from vfo to memory channel x" and to read the current transceiver status information. So I called ICOM Bellevue and asked about any programming information they might have. Very pleasant and polite chap in Technical Information department informs me they have and will send a packet of information called "Computer Interface and Programming Supplement For IC-735" which in reality is a supplement for any of the ICOM computer-compatible rigs including the IC-751, the R7000, etc. The only major difference in using the program is to select the proper address code for a specific rig. A complete description of all commands and responses is provided. Everything is there that is needed to provide an experienced programmer with the information needed to write a control program. It even tells me that the UX14 and CI V bus is a LAN (Local Area Network) that allows interconnection of a number of ICOM rigs over a single coax cable. The LAN has a CSMA CD (Carrier-Sense/Multiple-Access/ with Collision Detection) data transfer protocol. Does this sound familiar to you packeteers?

For the not-so-experienced programmer, the back of this booklet has what appears to be a Microsoft Basic listing of a program to drive an R7000 receiver. Some digging into the program reveals that it is probably written for an IBM PC or compatible (it has basic statements that open the COM1 serial port). So if one wants to talk to a transceiver, at least a software model is available in great detail. If you are fortunate enough to own a R7000, just key the program into your PC and run it.

The Programmers Package also includes a 15-page booklet titled: "A Simple ICOM IC-735 To Commodore 64 Interface" by Chuck Bahr, N7ICW. Information is provided on some very simple hardware interconnect between the IC-735 and the C64, and a complete Commodore Basic listing of a control program for the IC-735. Both of these booklets should be available from your dealer. So check with the dealer before asking ICOM directly.

It comes to mind that one could combine a computer control program such as the ones discussed above, with digital controller program like PC-PAKRATT for the beginnings of a computerised station. You could use the two programs separately but that would require some sort of multi-tasking operating system. One possible solution for PC owners is to use Microsoft Windows which is supposed to have some multi-tasking capability. Whether combined or separate under a multi-tasking DOS, one would need two serial ports on the host computer, one to control the PK232 and the other to control the transceiver. This requirement makes it difficult for C64 owners.

All this talk of HF transceivers brings us to the next subject.

WHAT A GOOD RTTY/DIGITAL MODE TRANSCEIVER SHOULD HAVE

I suppose that there are almost as many different ideas about what constitutes the perfect RTTY transceiver as there are digital mode radio operators. In my opinion, the perfect transceiver would have the following features and capabilities: Ten hertz synthesizer resolution and ten hertz display resolution. Excellent stability. True FSK on transmit. Mark frequency displayed when in FSK receive mode. Easy IF filter selection. Easy computer interface for transceiver control. Perhaps our readers can add to these "must have" features. (cont. pg. 15)

(Connections cont. from pg. 14)
Table 1 below illustrates a comparison of two popular transceivers used on RTTY.

DESIRABLE FEATURE	IC-751	TS-440
10 HZ DISPLAY RESOLUTION	N @	Y
FSK TRANSMIT	Y	N (afsk)
MARK FREQUENCY DISPLAY ON RX	Y	N (offset)
HIGH STABILITY	Y	Y
NARROW FILTERS AVAILABLE	Y	Y
EASY FILTER SELECTION	N *	Y
EASY COMPUTER INTERFACE	Y **	Y **

Notes:
* The IC-751 has FSK wide and FSK narrow which usually means the SSB filter in wide and either a 500 or 250 hz filter in narrow depending on which one you install. I believe the TS-440 allows you to select at least three bandwidths.

** Easy?, perhaps. Inexpensive?, no way! Although, in all honesty, the TS-440 interface adapter and level converter total about 100 dollars compared to the ICOM total of about 170 dollars.

@ It is interesting to note that during reading the ICOM programming supplement mentioned in preceding paragraphs, I find information that implies that, even though the tens digit to the right of the decimal point is not displayed on the frequency display of the IC-751, it is possible to command a frequency setting to 10 hz resolution through the medium of the computer interface and to read the current frequency to 10 hz resolution. It also implies that the current frequency is displayed on your computer screen as you manually move the tuning dial. If this is true, then, with the computer interface connected, the IC-751 becomes a nearly perfect digital communications receiver. But an expensive way to achieve it.

TABLE 1. COMPARISON OF DESIRABLE RTTY FEATURES IN TWO TRANSCEIVERS.

RUMORS

No real rumors, but AEA will soon be selling a new IBM PC program on disk for the PK232. This program is for the PK232 FAX mode and permits display of a FAX picture on the CRT if it was previously saved to disk. Without this program you can only print the FAX picture on the printer, not display it on the CRT. Works slick and has a zoom mode. Not a rumor because N7ML was demonstrating an alpha test version at the AEA booth during the Southwestern Division Convention. Expect release in a couple of months if all goes well.

Pac-Comm has a new ad in the media promising an ultra low power packet TNC in near future. Also something about a plug-in TNC/Network card for your PC. They also have a teaser "a unique new packet product". Watch for it!

Kantronics has been very quiet, and MFJ likewise. Wonder what they are going to spring on us? Meanwhile, I hear HAL is very occupied with government orders.

DATA TRANSFER SUCCESS REPORT

Last month you may recall that this column was to be submitted to the editor via a floppy disk in plain vanilla ASCII file format. I am happy to report that it works great and the transcription that used to take hours now only requires a few minutes. Our honorable editor can now wrap his fingers around a cool 807 instead trying to massage some life back into them after a marathon typing session.

I have run out of space so very 73 and cu next month.

de Cole W6OXP

(HITS & MISSES cont. from pg. 2)
Well, I'm sorry to say that will not really affect the cost of mailing because first class mail is not weighted the same way that second class mail is. As long as I keep the weight of the Journal under two ounces the first class mailing will stay the same as it is right now. To make it more clear to you, at the present time the first class mailing cost to mail one Journal to the Far East is $1.35. I think you can easily see that ten mailings a year and almost all of the $15.00 subscription price is wiped out and if one Journal doesn't get there, then we must send another to the reader. The subscription cost has been on the border line for some time because of the cost of mailing first class. There is another way to mail to our out of country readers and it is called "Foreign Surface" but it takes forever it get to the reader and many times gets lost. So even thought it may be cheaper, it is not practical. Enough said, I'm sorry I have to do this but if we are to survive it must be done.

ABOUT THE JOURNAL LABEL

The Journal label reflects all the pertinent information we have on file about each reader. We have your name, callsign, renewal date, address, whether or not you our a foreign subscriber and whether or not you receive the Journal via surface or air mail. Whenever you write to us always refer to the information on the label, it is an easy way for us to reference your inquiry. The easiest way for us to find you in the file is through your callsign, it is the most distinctive item on the label. If we do not have your callsign on your label be sure to let us know the next time you renew. One other important item - whenever you move or are about to move please let us know right away. We mail the Journal out to you on or about the twentieth of each month and we can change the file right up to the day we mail. Thanks for helping us keep you current.

TECHNICAL ARTICLES

We can use more articles of a technical nature. I know many of you have purchased new and different kinds of gear over the past year and by now have enjoyed using same. Along the way you may have had to work a few bugs out of some of this gear and that is where a technical article begins. Why not share your experience with our readers, take a few minutes and write down those little tricks you have found or your modification on how to make the gear work better or easier. In this issue you will find a couple of items in the "Connections" column but we could use more. I know they are out there, come on gang, I have twenty pages to fill and this is where I want to put your ideas. No matter if they are simple or complicated, this Journal is the place to share them. Also no matter if they are long or short we have the room to publisher your article. If you do not have enough for an article, then maybe you have enough information about a piece of gear that can be included in one of the other columns. If this case, send the information to one of the column writers, I'm sure they will happy to get it and follow up.

This also applies to technical questions. Send them to me or to one of our columnists. We will do are best to get you an answer. It would be nice if you would include an SASE with your inquiry. Remember, the Journal is your place to express your ideas and to ask your questions. It has always been that way and I'll never change it. Oh, by the way, that includes your ideas of what you would like for us to do that we are not doing now. If you suggest something and it is within reason we'll do our best to incorporate your suggestion.

One other thing I would like to mention. Maybe you would like to submit something but afraid to because you don't feel you are a writer. Golly, don't worry about that, we'll fix it up at this end. If I can't put it together then maybe one of the others on our staff can. Just get the information to us and we'll take it from there.

WHO'S WHO

Recently I received an inquiry about what all these contest letters stood for, such as, BARTG etc. Well I can see where someone new to RTTY would have some trouble with all the different abbreviations. So I'll try to untangle these for you by listing the most common ones we are associated with.

ANARTS - Australian national Amateur Radio Teleprinter Soceity. This group sponsors a RTTY contest in June of each year and they also publish a newsletter quarterly.

ARI - Associazione Radio Amatori Italiani. This group sponsors the VOLTA RTTY contest, named after Alesandro Volta. The group held their contest this year but it did not get much publicity. We need up to date information on the status of this contest.

BARTG - British Amateur Radio Teleprinter Group. They sponsor the Spring BARTG RTTY contest and it is quite popular. They also publish a newsletter quarterly. The BARTG group is a very active group.

CARTG - Canadian Amateur Radio Teletype Group. They no longer sponsor the CARTG RTTY contest due to lack of help to

(cont. pg. 17)

(HITS & MISSES cont. from pg. 16)
administrate it.We miss this one. They have also dropped their newsletter. Hopefully, things will pick up again soon for this group.

GARTG - German Amateur Radio Teleprinter Group. You will see DAFG (Deutsche Amateur Fernschreib Gruppe) designation used. They also sponsor a RTTY contest called WAE. They produce a nice newsletter bi-monthly with occasional articles in English.

SARTG - Scandinavian Amateur Radio Teleprinter Group. Each year this group sponsors the SARTG RTTY contest.

That's all the space for this month, so 73's and a Happy Thanksgiving to all. **de Dale, W6IWO**

EDITOR GOOF-UP

GIN, JA1ACB featured last month in the DX NEWS column has helped many new countries get on RTTY for the first time or has assisted many countries generously. I omitted this list of countries last month in the column and my apologies to Roy, Gin and Jim Smith, VK9NS who supplied all the information for the column. As mentioned in the article, Gin is to be commended for making it possible for these many countries to operate on RTTY. Here is the list and it is quite impressive.

VK9/T.N.G.	JD1/MARCUS	JD1/BONIN
9M2	P29	VK
CR9	AP2	KH0KG6S
4S7	VS5	9M6
FW0	ZL	ZK1/N. COOK
ZK1/S. COOK	HC8	ZK2
9N1	5Z4	A35
JT1	T30	ZL8
T31	HV	8RI
C21	DL	4U1
5V8	D68	ZB2
CT2	TL8	F
8Q7	I	D44
5X5	FO0/CLIPPERTON	JW
TZ6	VE	CY0SAB
VK9N	VK0/HEARD	3Y1/PETER1
VK9/COCOS		VK9X/CHRISTMAS

This is an outstanding record and many of us owe Gin for his generosity in making or helping out these areas with Amateur RTTY.

CONTEST RETRACTION: IMPORTANT NOTICE

The official rules on the WAE say, "A **CONTEST QSO CAN ONLY BE ESTABLISHED BETWEEN A NON-EUROPEAN AND A EUROPEAN STATION.**" Since attempts to reach the WAEDC manager for clarification have so far been unsuccessful, this year, whether by design or oversight, that rule apparently applies to RTTY.

In past years, the RTTY rules have always been formulated to foster more activity by fewer participants. Even then, the 1986 results included only 8 North Americans.

When I outlined this year's rule changes, the possibility that the Committee would limit overall contest activity by forbidding QSOs between non-Europeans was so implausible that it never occurred to me. The rule applies ONLY to non-Europeans. (The Committee writes, **"In the RTTY section of the WAEDC, all regulations are the same but to generate more activity in Europe and to raise the number of QSO-points, also contacts between European stations are permitted."**)

I hope that the new-cycle improvement in propagation lengthens the European openings enough to take some of the bite out of the new QSO limitation and that my confusion on this rule creates no unsolvable problems when you score your logs.

de Hal, WA7EGA, Contest Editor.

ED NOTE: We will continue attempting to get a clarification from the committee and will try to have more next month on these rule changes. If indeed this rule change stays in effect, then it will be extremely difficult for any West Coast operators in the U.S. to compete in this contest. Let's hope it was only an oversight on the part of the Contest Committee people. If you feel strongly that this rule change should not be incorporated in the WAEDC rules for this contest, I suggest writing to the Contest Committee and letting them know. I'm sure they would be sensitive to your suggestions. Their address is:

WAEDC Contest Committee
P.O. BOX 1328
D-8950 Kaufbeuren
Fed. Rep. of Germany.

RESULTS OF 1986 A.N.A.R.T.S. WORLDWIDE RTTY CONTEST

PLACE	STATION	QSO'S	POINTS	CNTRYS	CONTNTS	VK/ZL	TOTAL POINTS
SINGLE OPERATOR CLASSIFICATION							
1.	OK2FD	235	2814	73	6	500	1,233,032
2.	VK5RY	116	3328	51	6		1,018,368
3.	WB5HBR	135	1689	49	6	1500	496,066
4.	VK2BQS	56	1812	29	4		224,688
5.	ZL2ZKI	50	1470	23	4		135,240
6.	K6WZ	48	821	27	5	900	111,735
7.	LX2EL	61	797	30	4	300	95,940
8.	VK3JI	25	652	19	5		61,940
9.	VE2QO	19	400	18	6	300	43,500
10.	PA3DBS	70	344	29	4		39,904
11.	GW3EHN	43	288	22	4		20,054
12.	SP9BCH	46	258	21	3		16,254
13.	YU2CB	30	191	21	4		16,044
14.	DK5KJ	21	95	17	3		4,998
15.	VK2APQ	10	178	8	3		4,272
16.	DF5BX	20	79	15	3		3,555
17.	SP3XR	20	72	15	2		1,860
18.	JR1UTS	4	64	4	2	200	712
MULTI-OP CLASSIFICATION							
1.	VK2BYI	161	5415	54	5		1,434,975
2.	VE3UR	120	1436	45	6		388,220
S.W.L. CLASSIFICATION							
1.	ONL383		409	35	4		57,260
2.	DE1GMH		201	24	4		19,296

CHECK LOGS received from VK2EG, VK2SG AND VKJ2BIS

Contest Committee Comments: The number of logs received for the FIRST VK Contest was very disappointing. There were over 200 stations logged during the contest and only 25 logs received. We hope that the 1987 Contest will be as well supported, but with many more logs submitted. ED: If you participated in the 1987 Contest held the weekend of June 6th, please support this contest by sending your log in to the A.N.A.R.T.S.

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