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RTTY JOURNAL

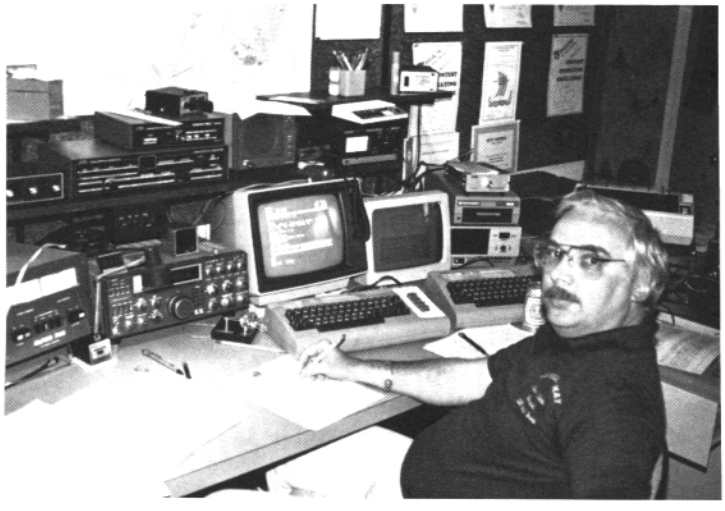
©

AMATEUR RADIOTELETYPE - COMPUTERS - PACKET

VOLUME 35 NUMBER 7 SEPEMBER 1987

U.S. HAMS TAKE BARTG CONTEST

THIS MAY BE A FIRST



ROY GOULD, KT1N - -678,280

HAL BLEGEN, WA7EGA --- JAY TOWNSEND, KE7PN -- 689,920

IN THIS ISSUE

RTTY JOURNAL
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Fountain Valley, Ca 92708
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SUBSCRIPTION RATES

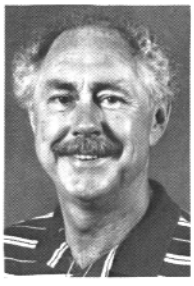
USA	$10.00 per yr.
CANADA/MEXICO surf	$10.00 per yr.
CANADA/MEXICO air	$12.00 per yr.
FOREIGN surf	$10.00 per yr.
FOREIGN air	$15.00 per yr.

All monies in U. S. currency only

POSTMASTER : The RTTY JOURNAL (USPS 391850) is published monthly except May/Jun and Jul/Aug issues which are combined for $10.00 per year by RTTY JOURNAL, 9085 La Casita Ave., Fountain Valley, Ca., 92708. Second class postage paid at Santa Ana, Ca. and additional mailing offices.
Postmaster : Send address changes to RTTY JOURNAL, 9085 La Casita Ave., Fountain Valley, Ca., 92708. **ISSN 0033 - 7161**

ABOUT THE COVER

Roy Gould, KT1N took Single-op honors in the 1987 BARTG contest with his outstanding score of 678,280. It may be a long time before another U.S. Ham comes up with a score this high. Also on the cover in the lower picture is Hal Blegen, WA7EGA and Jay Townsend, KE7PN who collectively took took Multi-op honors with their score of 689,920.This was another outstanding acheivement considering they did it from the Western Coast of the U.S. See more in HITS & MISSES column.



Dale Sinner, W6IWO
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Fountain Valley, CA.
92708

HITS & MISSES

It has now been a year since I took over publication of the RTTY Journal and you would think by now that I would be settled down. I wish I could say that was true but I'm afraid it is going to take a while yet. The last issue had so many mistakes in it, I'm really red in the face. My apologies again and hope you will bear with me.

The first mistake was the address of our newest columnist Hal Blegen, WA7EGA. This month his address is correct, so please, if you made a note of his address, change it right now.

The second big mistake was leaving out Hajime Suzuki's station picture which was mentioned in my column on page 13. So in this issue I have included his station picture, it is pic. #1. My apologies to Hajime for making this error.

Picture #1 Hajime Suzuki's station

There were other smaller mistakes made that I'm sure were understood so no need to dwell on them. I was trying very hard with last month's issue because it was my first twenty page publication. I guess I tried to hard and hurried to much and consequently made some errors. **(cont. pg. 4)**

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

MSO'S

OL' MAN LIGHTNING VISITS W5QXK

Some of you may have been wondering what has happened to Don Keifer's MSO, (W5QXK MSOQXK), and unfortunately I'm sorry to report that Don had a visit by Mr. Lightning Bolt, which literally decimated his RTTY and other amateur radio equipment. Evidently there was also serious structural damage to Don's home, that will take some time to repair. We all miss Don's big signal and MSO from Kaufman, Texas, and we hope that he will be back with us very soon.

I've seen an increasing number of lightning hit/near miss reports, that indicate to me that many Hams do not understand the basic reason for the required 'three wire' AC system, now in most homes. This system is not for protection from lightning hits or near misses, (although it will help in dissipating unwanted energies on the AC system), but rather the three-wire system is primarily designed to direct shorted appliances to "ground" easily, rather than killing the person utilizing that appliance. Unfortunately, when a direct lightning hit occurs, (and in many cases just a near miss), many documented cases of energies flowing back through the AC grounding system are seen, which are just as destructive as hits/near misses that find their way in via antennas, rotor cables, power lines, etc.

So, after all of these years of being told that a "good station ground" is essential, what is a fellow to do to improve his station protection? First of all a good, low impedance, station ground, is absolutely essential! And, each piece of equipment in the shack should be connected to this low impedance ground, either through a direct ground system, or through the building three-wire ground system.

But now comes the proviso! The only safe way to protect your equipment from lightning damage is to completely disconnect it from BOTH the AC power system, AND from your single point ground system, (as well as from antennas, rotor cables, etc.)! This complete isolation is a hassle of course, as you need to be aware of each cloud as it comes over the horizon, and then unplug and disconcert your equipment.

In my personal station, (which includes something over 20 individual pieces of equipment), I try to make things as easy as possible, yet satisfy myself that ol' Mr. Lightning Bolt won't visit me unexpectedly! I use four of the "multiple outlet" power strips, so that unpluging the AC line only requires the removing of four plugs. And, I use a single point ground system, with each piece of equipment connected to it, which utilizes a large "alligator clamp", (from an old set of car battery jumper cables), that facilitates easy removal of the ground system.

At the first sign of lightning activity, I disconnect the four AC strips, disconnect the ground system, antennas and the rotor cable, and go get a cup of coffee! Should I take a direct hit, (Heaven forbid!!), at least my equipment will be safe from transients on the AC, ground and antennas paths. It's a bit of a hassle to be plugging and unpluging each time a cloud comes over the horizon, but it's sure better than paying the repair bills!

W1VTP 75 METER MSO

I received a nice letter from Al Brown, W1VTP, Manchester, New Hampshire, who relates that he is now operating a 75 Meter Mailbox on 3629 Khz, (Mark is 3617.875 Khz), week-days each evening from 1800 to 2200 hours, (except Thursday evenings when the system is on 147.225 Mhz, on a local repeater). Weekends his system is active all day until 2200 hours.

The access code for Al's system is: //AWAKE. To close his system use: //SLEEP. The system runs at 74 baud Baudot (100 WPM). Al is trying to encourage the use of 3620 Khz as the "calling frequency" for the New England area. While he is in the shack, Al enables his "beacon" at 10 minute intervals, transmitting "New England calling, frequency 3620 Khz, W1VTP Mailbox, ..." Al disables his beacon when he is not in the shack, and upon request. Good luck Al!

MSO HINTS

The K0VKH "Tech Library", (maintained as part of the KOVKH MSO System, and located on the National Autostart Frequency), now has fifty-five 'pages' in it. The two latest additions to the library concern an "Unterminated I.C. Gate, HAL DS/MPT-3100 ASR Terminal", and "Procedures for replacing the lamps in the 'sub-display', Kenwood TS-940S". Remote users may obtain any of the

(cont. pg. 4)

(MSO's cont. from pg. 3)
technical information in this Library by first reading the 'index' located in the K0VKH MSO, and then leaving a short note in the MSO listing which files you would like to obtain. KOVKH will load those files into the MSO, addressed to your callsign, so that you may obtain them at your convenience.

MSO/CBMS/Mailbox Utilization

I'm sure that there are lots of RTTY'ers out there utilizing their MSO's for things other than just informal messages between to distant parties. And, I'd like to publicize your activities in this column. I'm more than happy to provide net schedules, traffic information, "how to" specifics, etc., on just about any subject relative to how you are utilizing your CBMS or mailbox. Drop me a line either at my home QTH, or to "The Journal", and I'll take it from there. Thanks!

MSO RAMBLINGS

Been looking for Clark, W9CD, recently? Although he still picks up traffic directly to him on the National Autostart Frequency on 20 meters, recently he's been active on 30 Meters, with both a Packet BBS, and some AMTOR activity. His very popular "MSO Program", written to run in IBM's (and clones), is showing up more all of the time. For information on this very sophisticated program, contact him via any of the MSO's on the National Autostart Frequency.

--- Gaylord, WB8ICL, is running an IBM clone on RTTY. In fact, it's doing double duty these days, maintaining an active MSO on the National Autostart Frequency, and a very active Packet BBS on VHF in the Dayton, Ohio area.

--- John, TG9VT, (GUATMAIL MSO), reports that he's now worked his 189th DX station. Pretty significant for a guy who maintains an active MSO most of the time! Congrats john!

--- Bob, W7IQO, from Scottsdale, AZ, reports that his MSO will be inactive for most of the month of August, due to some extensive travel plans. But, his MSO will be back on a full time basis about the first of September.

--- Brownie, K5FL, Denton, TX, reports that he will be more active on the National Autostart Frequency in the future. He is also planning on maintaining an IBM clone system on VHF in the Dallas area, which will provide several nice services.

That's it for this month Gang! I hope that everyone is having a very nice summer, and fun on RTTY! See you next month!

de Dick, K0VKH

(HITS & MISSES cont. from pg. 2)

SUPER CONTESTING ACHIEVEMENT

I'm not an avid RTTY contestor, but I do get involved from time to time. Over the years I have only competed about four times but each time I have always enjoyed contacting stations around the world. There are many facets to RTTY operating and I think the Hams who are involved in MSO operation, Rag chewing, etc., who always step aside during contest periods should be commended for their respect of the other modes of operating RTTY.

While on the subject of contesting, Roy Gould, KT1N, Hal Blegen, WA7EGA, and Jay Townsend, KE7PN are to be complimented for their outstanding efforts in winning single-op and multi-op respectively in the 1987 BARTG contest. Since all three of these Hams are connected with the RTTY Journal they have been modest in their respective columns on giving themselves the recognition they rightly deserve. Most contestors know that winning this very popular contest takes a great effort and these three Hams certainly gave it their all. Over the years contest rules have been changed from time to time to make it a little easier for U.S. Hams to compete but without the help of many U.S. Hams competing it would be impossible to win this contest which has been traditionally dominated by European stations. This also proves that contests can been won by U.S. Hams when they put forth the effort it takes to compete aggressively. Roy Gould, Hal Blegen, and Jay Townsend did just that, my congratulations to you all. KUDOS, KUDOS, KUDOS!

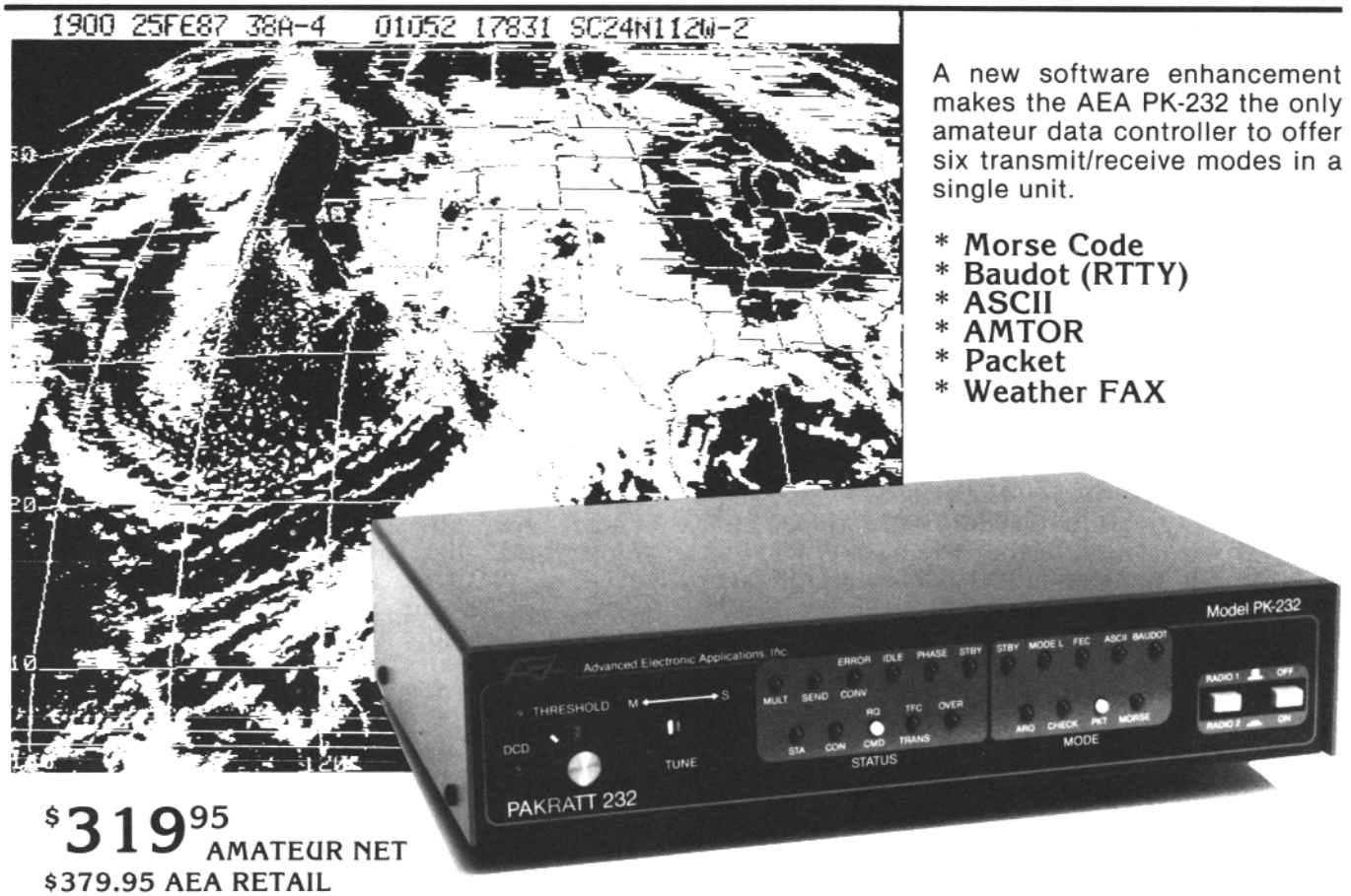
Roy Gould, KT1N in his column this month makes mention of a worldwide contest championship award. Sounds great to me but I would like to hear from the other groups around the world, also from the manufacturers and suppliers who might be interested in contributing an award.

Roy also mentions the RTTY Journal awards program which has been somewhat slow getting off the ground. Just this month I completed arrangements with Hal Blegen, WA7EGA and Jay Townsend, KE7PN to take over this program. I have the records and after publishing them last year asking for responses to possible errors I think we can move forward accurately from now on. Watch for the awards program update coming up soon here in the Journal. I have received mail from some wondering what is going on with this program, so please be advised it is not dead and it will back on line again real soon. If you have been waiting for an endorsement, please be patient, it will be coming to you soon.

That's all the space I have for this month, so until next time - 73's for now de Dale, W6IWO

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.

* **Morse Code**
* **Baudot (RTTY)**
* **ASCII**
* **AMTOR**
* **Packet**
* **Weather FAX**

$319.95 AMATEUR NET
$379.95 AEA RETAIL

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.

Contact your local AEA dealer today for more information about the one unit that gives you six modes for one low price, the PK-232.

AEA Brings you the Breakthrough

2006-196th St. SW
Lynnwood, WA 98036
(206) 775-7373

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

CONNECTIONS

HELLO THERE - hope everyone has had a nice summer. It has been nice out here in Southern California and I even got to go fishing a couple of times. Now that we are back on the regular monthly publishing schedule, I am going to have to concentrate on getting this column into Dale on time.

THERE IS MAIL

And a reply to a readers question. Hal, WB2BNH wrote that Robot has a modification available for the Robot 800 that modifies is to a 800-C. This gives the Robot the capabilities for a RS232 port and a parallel port. Robot also sells the cables for the connections to a serial or parallel interface printer. Hal has this modification on his Robot and says it works fine. Thank you very much Hal for taking the time to write in reply to the Robot question from Jim, N9DUZ that was in the July/August issue of the Journal.

George, WA6KAA is looking for info on connecting a Gemini 10X printer to an INFO-TECH M200F. Most Gemini printers have a parallel port, so one would need a serial port modification to the printer to match the RS232 output from the INFO-TECH unit. If the Gemini 10X already has a serial port connector, then all that is needed is to connect the proper pins in the printer connector to the RS232 connector on the INFO-TECH. Don't forget you may have to cross connect pins 2 and 3 between the two units as they are probably both configured as DTE. (See my RS232 discussions in January 1987 and February 1987 issues of the Journal).

TS940S AND ST-6 TO COMPUTER INTERFACE

Bill, W6OWQ, provides us with an easy method to connect a TS940S and an ST-6 demodulator to a IBM PC clone computer. The ST-6 has a TTL level I/O and the computer has a RS232 I/O. So what Bill needed was a level converter. Figure 1 is a schematic of his circuit illustrating the connections for the TTL-level data output from the ST-6 to the Receive Data input in the RS232 connector on the computer, the transmit RTTY data output from the computer to the FSK input to the TS940S, the PTT control from the computer to the TS940S, the amplifier, and the ST-6. The transistors can be almost any NPN device, the diodes can be 1N914 signal diodes or 1N4002 rectifier diodes. The adaptor can be built into a small minibox or other metal box. If you use RCA jacks for each connection, it is easy to run the shielded wire connections to each unit. The program Bill uses with his PC is called COMPRTTY and was written by David Rice, 25 Village View Bluff, Ballstrom Lake, NY. 12019. Control F2 function key is used to toggle the system between transmit and receive via pin 20 of the computer I/O.

Thank you very much Bill, for sending this in for publication. It is sure to make things easier for others with similar equipment. And such submittals do make this column a heck of a lot easier to write!

COMPUTER SOFTWARE & PK232 TNC

There are also such things as software connections, like getting the right kind of software to drive a piece of hardware, and getting it to do what you desire. As I mentioned in the last months column, I had been using a software program called DIGIPAC II on my IBM PC clone to make it easier to use my PK232 TNC. Well, that program sure does make a lazy man out of a person. I have been a touch typist for forty two years and always had thought that keyboard macros and smaller methods of sending a long and/or complex string of characters with one or two keystrokes were for the "hunt and peck" boys who don't know one "home" key from another. Half a day with DIGIPAC II sure changed my mind, I don't mind telling you! This program assigns keys for various PK232 commands, has a lower window section with labels for all the function keys in all three combinations (ALT, Shift, and Unshifted function keys) and just generally a good method of making command of the TNC a real pleasure. The package will work with almost all brands of TNCs but only with the IBM PC or clone type computer. However, I had been using a PK64 before I got the PK232 and I missed the status lines on the PK64. These status lines are continuously updated to display connect status, receive buffer remaining, transmit buffer remaining, number of retrys, number of frames outstanding, etc. The Kalt Associates DIGIPAC II had everything except the real-time status display.

Just about this time, AEA announced the PC-PAKRATT program for the PK232. As soon as the local dealer had it in stock, I bought a copy ($25) and lo- it duplicates the status lines of the PK64 and also does most of the things the DIGIPAC II can do although sometimes in a

(cont. pg. 7)

(Connections cont. from pg. 6)
different style. AEA was able to do this because they very cleverly (perhaps some would say sneakily) built a special mode into the PK232 called the host mode. The PK232 Technical Manual, also just released, provides full command/response documentation on the host mode, making it possible for a programmer to take a program such as DIGIPAC II and modify it to work with the PK232 and provide the same features as PC-PAKRATT. Also, the program could be converted to run on other computers such as Apple or Atari. However, it would be a rather large task as you would not really be able to "convert" because the source code is not available. But one can write a detailed functional specification and then write a program for a particular computer to fully implement these functions.

AEA is to be commended for releasing the detailed documentation on the PK232 host mode. An "open system" like this is a great boon to all of us who are interested in digital communications. I think we can expect to see other TNC manufacturers come up with similar host mode schemes for their new models.

RUMORS

I hear via the grapevine that AEA will soon release a new firmware program for the Commodore C64/128 to allow use of a PK232 with the Commodore and provide the same screen display features and status lines as provided in PC-PAKRATT. It is said to include a RS232 adaptor for the C64 user port for connection to the PK232 and includes a cable. The program itself is contained in a cartridge which means you don't have to have a disk drive to run it. Rumor has it that is sells for about 59 bucks.

How about sending me a card with your choice rumors and gossip inscribed thereon? If the rumor is so juicy or scandalous that you wish no attribution, we can handle that too, although we might check around a little bit in such cases.

ARRL 6th ANNUAL PACKET RADIO CONFERENCE

This conference was held Saturday 29 August at TRW in Redondo Beach, Ca. Bigger and better than ever, the printed proceedings of the conference ran about 180 pages with 31 papers presented. I saw quite a large crowd but did not get around to counting them. There was quite an emphasis on standards and protocols, plus a nice paper on a 56 kilobaud RF modem and another interesting paper on a BERT (bit error rate tester) that could be built quite easily and at reasonable cost. Until next month, very 73

de Cole, W6OXP

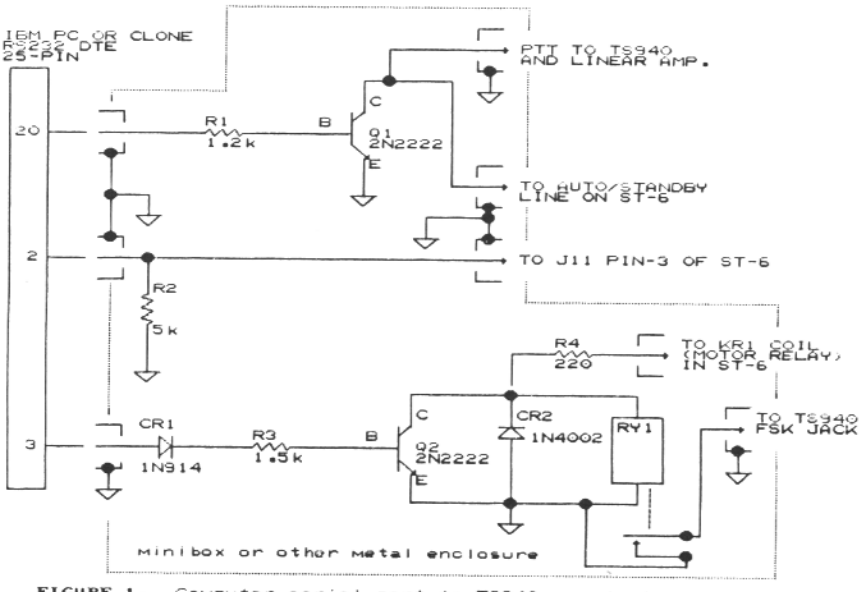


FIGURE 1. Computer serial port to TS940 and ST-6 demodulator adaptor. design by W6OWQ

RY1 is Radio Shack 5-volt coil reed relay (blue in color).

Craig, WA7HIN **Kathy, KA7IVA**

Roy Gould, KT1N
P O BOX DX
Stow, MA. 01775

DX - NEWS

Hello again fellow DXers. I hope the summer was a great one for all of you and everyone got the chance to do what they wanted to get done, new antennas, fix the old ones, raise the tower etc. It seemed to fly by here, I can't believe that it is the end of August as I sit here and write this column. The bands have not been to great of late but some good days here and there. I did manage to work Joe on Johnson Island KL7LF/KH3, he had a big signal here on the east coast the other night. That really has been about the extent of the new ones for me all summer, as I have been very busy at work getting ready for a big two week Show beginning Labor Day, September 7 and then after that I am off to Quito Ecuador and the Galapagos Islands for the CQWW/RTTY Journal RTTY contest with Hal, WA7EGA, Jay, KE7PN, Betsy, KE7PL (Jays' XYL), Ted, HC5K and other HC hams. Lots of plans to be made, gear to get lined up, passports etc., etc. We are all looking for a great time and a great contest and will be bringing you all a full report between Hals' column and mine.

RTTY CHAMPION

Luc, I2OLW wrote me a nice letter and I will share it with you as we feature Luc as the RTTY DXER of the month. However, there is an idea in the letter that I would like to point out. Some years ago I recall that there was a World RTTY Champion Operator award. It is not clear to me who ran it and how it was administered, but it was on a point basis for operating and placing in the various RTTY contests. I have not heard anything about this award in recent years and Luc is proposing someone bring it back.

What he is proposing is as follows. We take all the active RTTY contests on HF, such as SARTG, BARTG, VOLTA, ANART, WAE, and the CQWW/RTTY Journal and assign a point system for placing in the contest results. For example: 1st place to receive 9 points, 2nd place 6 points, 3rd place 4 points, 4th place 3 points, 5th place 2 points and 1 point for participating and sending in a log. At the end of the contest year, we add up the points and the high point winner is declared that years' World Champion RTTY Operator. Luc's proposal suggests that each year a different contest sponsoring society be the group in charge of compiling the results and making the awards. He suggested that perhaps some equipment award be offered as a prize and that this be donated by a manufacturer or supplier. I would like to suggest that perhaps a magazine sponsor a plaque or trophy instead (maybe us Dale?) At least I would like to know of your interest in this type of an award. What do you out there think? Let me hear from you and if there is ample interest, I will go to work on it. So please write and tell me your thoughts and be sure to include your ideas.

RTTY DX HONOR ROLL

Another idea that has been kicking around is putting together our own RTTY DXCC Honor Roll. Dale has the records of the DX awards that the Journal has given but has been busy reshaping the Journal and improving the quality, so consequently has not really had the time to get the records together and published frequently. (ED: See Hits and Misses column this month for more on this) I'm proposing we issue an Honor Roll certificate of our own because at present there is no ARRL RTTY DXCC Honor Roll. We would like your input on this proposal, so again I ask, please write to me or to Dale at the Journal address and let us know how you feel about this.

MAILBAG

I also received a nice letter from Kathy, KA7IVA, and she passes along that she now has 84 countries worked and 54 confirmed. She also is looking forward to the upcoming CQWW/RTTY Journal contest. (A good chance to work new ones) Besides chasing DX on RTTY, Kathy is trying to QSO with YLs on RTTY. So far she has talked to YLs in 10 countries and 8 states, with the youngest operator being 11 year old Colleen, KB2BRL! So if you are a YL and on RTTY, drop Kathy a note at her CBA and make a sked. Kathy sent along a photo of herself and OM, Craig (Pic#2). I have asked Dale to publish it even though I am a New England Patriot football fan ... Seattle Seahawks Hmmmmmmm. Thanks Kathy for your letter.

George, W1DA, passes along that he just received a QSL card from the recent 9NITU Nepal Expedition. On the card it says "only USA station worked on RTTY"!! Congrats George, a very nice catch.

The mail also brought a very nice letter from The Student Radio Club at the Technical University at Russe, Bulgaria, LZ2KIM. Milen, LZ2MP writes to tell us that they are new on RTTY as of January 1986. In May they got on AMTOR and recently got on Packet.

(cont. pg. 9)

(DX NEWS cont. from pg. 8)
They are very active in all the contests and also arelooking forward to the CQWW/RTTY Journal contest. They have a TS830S, TS130S,homebrew linear, 2 element Quad for 20,15,10 and dipoles on 160,80 and 40. For RTTY they use an Apple II+ homemade TU and software. They were the first LZ station on AMTOR and Packet. They would like to hear from any Journal readers who can help them with the following:

Homebrew TNC units, schematics, software, etc.
Software for the Apple II+, for Packet, AMTOR, RTTY and general ham radio use.

If you can help, please write to them at the following address:

Student Radio Club, LZ2KIM
P.O. BOX 12,
7004 RUSSE
BULGARIA

RTTY DX NEWS

Isle of Man, Al, G4CVZ, lets us know that the Liverpool and District Amateur Radio Club will be active from September 4 to the 14th from GD land. (ED: I'm afraid this comes to you to late, but hope some of you caught them on the air) QSLs go to G4CVZ.

Johnston Island, KL7LF/KH3 was worked on 22 August on the east coast with a very strong signal at 0400 UTC. Joe continues to be active on the keys s he promised.

Fernando de Noronha, Karl, PS7KM in a QSO the other night told me that he and others will be on September 9 to 13 from here. Again if you work them, QSL direct as follows:
Karl Mesquita Leite, Caixa Postal 385, 59001 Natal-RN, Brazil, South America
Calls to be used for this expedition will be: ZY0FMN, ZY0FCA, ZY0FKL, ZY0FRT, and ZY0FCM

China .. Nothing heard by me or reported on the BY trip mentioned in last months column! Did anyone hear them?

Iwo Jima .. KA2PF was supposed to show as KA2IJ and 7J1ADI/JD1 from Sept 2 thru 16. QSL to KA2PF.

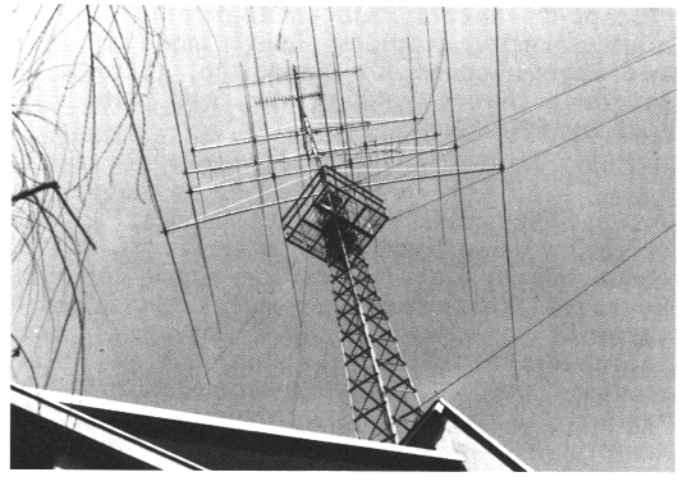
Suriname PZ1JS, Jos continues to be very active on the keys and is a good QSLer. Look for him about 0000 UTC most days.

TG9VT, John took a lightning hit the middle of August and as a result his MSO which has lots of good RTTY DX goodies in it, has been off the air. Unfortunately, that is where I pick up some of the RTTY DX news to share with you. I did talk to John and he said no real serious damage but there is some antenna work to be done and the Linear needs parts. He plans to have everything fixed in time for the contest this month. He also is going to be in the Boston area next month and we have a dinner scheduled.

RTTY DXER of The MONTH
Lucio "Luc" Oriani, I2OLW

Let me tell you about myself. I am 29 years old and involved with Ham radio since 1974. In December 74 I got into RTTY. It all started with an old mechanical machine, an Olvetti T2 and home brew TU. All tied to a Yaseu FT101 and 2 element Guad. My passion for RTTY and especially RTTY contests grew and grew and now I have a DS 3100ASR, homebrew ST-6 TU, a Drake C Line and a 60 foot self supporting tower with Mono Banders for each band. On the software there is an Apple IIE with homebrew software for station control and contest logging. Recently I purchased an Amiga 1000 which will substitute for the Apple. I am also active on AMTOR and Packet with an AEA PK232 tied to the Amiga. **(cont. pg. 11)**

LUC, I2OLW at station controls



I2OLW Antenna farm

AEA PK-232 REVIEW

by Dave Fine, W0DF
932 Jungs Station Rd.
St. Charles, MO 63303

I have been involved in nearly all phases of amateur radio during my past 25 years as a Ham, but still find the most enjoyment in casual listening on the various special modes. Having acquired a room full of equipment, including five different TTY machines, I have come under close scrutiny of the XYL and have been asked to consider consolidating (read as "dispose of") some of the "junk". When AEA announced an updated version of the PK-232 with a Facsimile mode, I couldn't pass up the opportunity to appease my lovely wife.

The pre-FAX model of the PK-232 with CW, Baudot, ASCII, AMTOR and Packet has been reviewed in various amateur publications, including the RTTY Journal, therefore, I will describe only the FAX addition in this review.

STATION INTERFACE

Packed with the PK-232 is one of the most informative, well written instruction manuals I have seen. All aspects of operation are thoroughly explained. I can't say enough about the manual. It is a masterpiece. Also packed with the unit are all cables necessary to interface the station equipment, including a cable that ties the PK-232 to the host computer and printer. The user must supply the connector to match transceiver microphone jack. Pin connections for most brands of equipment are listed in the instruction manual.

Printing facsimile images requires a printer that supports the EPSON graphics standard. To determine if your printer is compatible, check the instruction manual for the following two Escape codes. The command "Escape-K" should set the printer to the single-density, 8 dot graphics image mode. The command "Escape-l" should set the printer to the double-density graphics image mode. If these two Escape codes are supported, there is an excellent chance your printer will print FAX with the PK-232.

PK-232 OPERATION

As is the case with other modes, PK-232 operation is directed by a series of RS-232 commands or mneumonics via your computer keyboard. These commands offer considerable versatility, allowing the changing of such parameters as FAX speed (number of lines scanned per second), aspect (horizontal to vertical aspect ratio), print density, positive or negative image printing and scan direction reversal (for those images sent from right to left). A brief description of these command mneumonics will provide much insight to the FAX capabilities of the unit.

FAX -- commands the PK-232 to the FAX mode from whatever mode it previously was operating in.

PRCON -- (ON/OFF) connects/disconnects the parallel printer to/from the PK-232. PROUT (ON/OFF) directs all text characters, including terminal echoes, to the parallel printer. The command also works with other modes to obtain hard copy of what is being received by the PK- 232. It is especially desirable for those using a dumb terminal with the PK-232 who otherwise cannot print hard copy of received text.

RCVE -- places the PK-232 in the receive mode to await a sync signal from the transmitting station.

LOCK -- is a manual start command for FAX. It commands the PK-232 to start printing regardless of whether or not the facsimile sync pulses have been detected. When synchronization is forced in this manner, the chances are good that the FAX image will not be aligned with the printer page, that is, the picture may be split in the middle, with the left half of the picture on the right side of the paper and the right half on the left.

JUSTIFY (n) -- is used after a LOCK command to synchronize the margin of the picture to the printer paper edge. This will correct the split image described under the LOCK command. Each (n) value moves the picture margin one half inch closer to the margin of the paper.

FSPEED (n) -- matches the PK-232's receiving speed to that of the transmitted signal. All weather charts that I have copied have been at the default speed of 2 lines per second. Wirephotos (AP) were copied at 1 line per second.

ASPECT (n) -- controls the aspect ratio of the length to the width of a FAX image. On most weather charts, the default of ASPECT 2 keeps the shapes received in the right proportion.

FAXNEG (ON/OFF) -- reverses the black and white senses. Some FAX services send images in a reversed format. This command compensates for this.

LEFTRITE (ON/OFF) -- reverses the scanning direction.Some services send images from left

(cont pg. 11)

(PK-232 cont. from pg. 10)

to right, others may do just the opposite.

GRAPHICS (n) -- determines the horizontal print density of the parallel printer. Different density prints may be chosen according to the FAX image being sent and to how often you can afford to buy new printer ribbons. As could be expected, printing FAX images is pretty rough on ribbons.

Transmitting FAX signals is possible from the PK-232, however, your computer terminal/communications program must be able to capture 8-bit ASCII files. Received images can be saved to disk in this manner and then retransmitted through the PK-232. I have not attempted to transmit FAX images and will therefore not explain the commands involved with this mode.

PRINT QUALITY -- The PK-232 is not intended to replace a high quality facsimile printer. The technique it uses to produce facsimile pictures produces a pseudo-FAX image which is either black (a print dot), or white (no print dot). This is relatively unimportant when used to print weather charts, as there are no gray tones on them. Geographic outlines are usually quite discernable, however, some of the charts contain more detail than the PK-232 FAX method can reproduce, particularly when very small numbers or symbols are contained on the charts.

Wirephoto images created by this dot/no dot method are very similar to high contrast black and white photographs. These images are certainly interesting to view but sometimes require more resolution than the PK-232 is capable of producing. Again, let me stress, the PK-232 was not developed for high quality FAX printing. A true FAX receiver/printer combination would cost much more than the PK-232 and would be usable only for FAX.

I have compared weather charts produced by the PK-232 to those produced by the IBM software method described in March 1987 QST. A test pattern received on both units yielded slightly better resolution on the PK-232. I am not sure if this was due to atmospheric conditions or to software/printer differences. Also, keep in mind that the QST approach is not nearly as flexible as the PK-232 as it has fixed speed and aspect ratios, and therefore, is not capable of receiving the wirephoto images.

In retrospect I probably would buy the PK-232 for the FAX capabilities alone, however, combined with the other 5 modes of operation that it offers, it has to be one of the best values on the amateur market. In the several months that have passed since I acquired the PK-232 I have spent more time enjoying amateur radio than I have in the past six years. It will make an interesting and fun addition to any shack.

de Dave, W0DF

(DX NEWS cont. from pg. 9)

The BARTG was a great surprise this year for me. Especially on 40 meters with my 3 element beam. At the final stop I had 400 QSOs with 128 multipliers and a score of 625,000. (Note: almost beat me) That is not bad despite bad conditions on 15 and 10 meters. The Amiga was not in operation as I am re-writing the whole software and also want to include the antenna control from the keyboard and graphic window with an animated Dx-Edge type window. I am in the process to see if all this is possible with the Amiga and PK232.

That's all for now, 73 and good DX, will see you in the next contest. Luc, I2OLW

Thank you Luc for your letter and the great score in the BARTG. I pulled the part about Lucs' ideas on the RTTY World Championship award out of his letter and highlighted it separately in this column. Also in this issue is a photo of Luc and his antenna farm. A description from top to bottom of the antennas at I2OLW are as follows: (Pic# 3 & 4 pg. 9)

2 X 5/8 collinear for 144 Mhz
2 X 5/8 collinear fro 432 Mhz
16 element Tonna for 144 Mhz
21 element Tonna for 432 Mhz
55 element Tonna for 1290 Mhz
91 element TV antenna
5 element Hy Gain for 10 Meters
5 element Hy Gain for 15 Meters
4 element wide spaced Hy Gain for 20 Meters
3 element Hy Gain modified for 40 Meters
Dipole for 80 e/w

SARTG CONTEST

Hal will give us a full report on this contest I am sure, but wanted to comment on the levelof activity. Unfortunately I could not seriously take part this year, but the few hours I was on there was a great deal of activity with some great scores!

Well that is it for another month. Tell your friends about the Journal and let me know what you are hearing.

73, and a Tip of The Hat to W1DA, TG9VT, LZ2MP, KA7IVA, I2OLW, W0LHS, WA4WIP, N1DGC, PS7KM and the DX Bulletin.

de Roy, KT1N

Wide Dynamic Range and Low Distortion — The Key to Superior HF Data Communications

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- 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
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CONTESTING

THE WINNING EDGE

A bachelor who retires on 40 acres in the country would probably do well at contesting. Next best might be a fellow whose XYL mows the lawn, likes tall, galvanized trees, and visits her mother on selected weekends. If he's not retired, he needs a job where the boss won't miss him on the Friday before the contest or expect full consciousness on the Monday after. His amp should be capable of incinerating flying insects within 10 feet of any energized element and he'll need the famous 599 antenna system (5 KW into 9 tons of aluminum on 9 acres circled in red on airline maps). The last step is a move to a Don-Search-approved, southern-latitude country outside North America where hams are scarce. This mythical country must have all-band propagation to both the U.S. and Europe and a climate that makes neckties taboo. It also needs reliable power, honest banks, cheap booze and not to have some kind of war going during contest season. (*definition of RARE COUNTRY courtesy of the IEDXA unabridged*).

BARTG

This year's BARTG gives us a little more encouraging idea of what it takes to be competitive in an RTTY contest.

A lot of us are grateful to KP2N and WA4WIP for giving us a shot at VP2E during the contest. Coincidentally, they piloted VP2EDX to a strong third place in the multi-op category in spite of being new to multi-op contesting and limited to 100 watts and a portable vertical. But rare isn't a contest clincher.

Few stations in the contest put out a better signal than HC5K and his crew running a one-time call, HD5G. Although Ecuador may not be the rarest of DX, the call made him a WFWL (Work First-Worry Later) station that you looked up after the contest. Running half a KW to a Christmas tree of beams on all but 80 meters, HD5G was S9 everywhere (including 10 meters) and compiled more QSO's than any other station in the contest. Congrats to Ted for an excellent 2nd place effort but loud and rare still didn't win this particular contest.

KT1N took all the single-op bows from Stow, MA. with 4 element monobanders on 20 and 40, a tribander, an 80 meter sloper and 600 watts. He says, "I mainly perched on a frequency and called CQ. I also had the other VFO on the rig tuned to another portion of the band, some 10 or 15 Khz away from my CQ frequency. When things got slow I would switch to that frequency and see if there was someone around there that I had not worked. This was easy to do as I would just type their call into the logging/duping computer and see whether or not I had worked them".

WA7EGA slipped past HD5G by a few multipliers to take the multi-op class from Spokane, WA. using 5 element monobanders on 20, 15 and 10, 2 elements low on 40, an 80--meter dipole and 950 watts. Jay, KE7PN, stresses game plan. "I almost killed Hal for deciding to end a planned 6-hour rest period early to work the east coast on 80 meters. He picked up 10 QSOs and 3 multipliers but if the European opening had not been late that morning, he could have cost us 3 hours of prime time at the end of the contest. You make a plan and stick to it," he says.

Good advice but sometimes you can get lucky! Jay and I did a lot of band hopping. That is probably the biggest advantage to a multi-op effort. We will cover a multi-op operation in detail next month when we get back from the HC5 shot in the CQWW/RTTY Journal contest.

A REALISTIC ASSESSMENT OF EQUIPMENT

Actually, you can still do well in an RTTY contest with a low tribander and wire on 40 and 80 meters. A giant beam on 20 might improve your score, but it is not a requirement to compete and it won't guarantee winning! On some quick, shortpath tests with TR8DX one afternoon (a long haul from Africa to Spokane) the most I could show was one S-unit between a 5- element monobander at 96 feet and an elderly TH6DXX at 62 feet and no difference in copy, either direction. Tribanders are somewhat more flexible both for quick band changes and for spotting and station efficiency is the key to getting multipliers.

Forget SSB filters. Anything wider than a 250 Hz I.F. is a step down. The best audio filter sold won't help if WB5HBR calls "CQ CONTEST" 500 Hz up the band from the EA8 you're trying to work and overloads your receiver. It's simple -- no filters, no weak-signal DX. Compared to the rumors I hear of 2500 watt smoking guns used in contests on other modes, RTTY is reasonably tame and very effective at power levels less than a KW. True, unless you have something to

(cont pg. 14)

(CONTEST cont. from pg. 13)
prove or just enjoy pain, 100 watts for contesting is a minimum but you probably won't notice the difference between a station running 500 watts and one pumping a full KW to the antenna. Low power leaves some room for improvement in pileups but on RTTY a howling mob can turn out to be as few as three stations deep.

In a contest the DX is usually prepared to hang in there and work them all. I have wasted 15 minutes during a prime band opening into the Caribbean beating my head against a curtain of W4 and W5 stations only to find the PJ7 all by himself a half hour later. If you can't beat through with two or three calls, at least keep track of it while you continue to work another frequency. The critical point comes when the pileup thins enough to get through but before the rate dropped enough for the DX to consider moving.

For a U.S. station, the QSO rate will never even approach maximum efficiency so a clear understanding of propagation and new band openings become critical. The RTTY contest rewards planning and frequency agility over signal strength more than any other mode.

KT1N said that he completely revised his game plan when he discovered that neither Jeff, 9H1EL nor John, ON4UN were seriously in the contest. He made up an operating plan for on and off times and stuck to it.

About BARTG Roy said, "My QSO count on 40 was down from previous years. It also is very difficult to get the gang on 80 other than the ones who go down there that are in the contest to give you a QSO." KE7PN (Jay) agrees, "The only way for North America to compete with Europe in many of the contests is to get some U.S. activity on bands other than 20 meters."

Although we are talking minimum system, almost any terminal unit on which the threshold can be set to print no-signal static is fine. Picking the exchange out of the garbage should be an operator function and you don't want the TU shutting down on weak, fluttery signals due to some threshold setting that you can't control.

In the BARTG, KT1N used AEA's top-line ATU1000. He writes, "A pleasant surprise... The unit really hears extremely well and anything that so much as burped on the 930 (Kenwood TS-930) I was able to get copy on. It had the ability to look at either mark or space tones and this was very useful when I had pileups as I could just look at one tone and get print."

Jay, KE7PN, and I have used a variety of TUs and found no significant advantage to any particular one for contesting however I stress, all these units sold for $300 or less. The difference between the lower priced units and AEA's ATU1000 may account for part of the fact that KT1N, as a single op worked more QSOs than Jay and I and came within a few thousand points of our multi-op score. But I still maintain that the best engineered TU is not a substitute for effective I.F. filters.

In any case, the very best way for the North American stations to improve their score, is to generate more U.S. contest activity! On the BARTG first night, 40 meters had more activity than I have heard since I started seriously contesting. We worked 25 multipliers on 40 and picked up another 23 on 15 meters! This years' BARTG clearly shows that with 31 single operator stations committed enough to send in their logs (WA3ZKZ, WA9TMU, and NQ2O sent check logs), the activity generated put eight North American stations into the top 20 in the world and put KT1N and WA7EGA on the top of the heap. I would not be surprised if that was the best showing so far accomplished from this side of the pond. Congrats to all and thanks!

Conditions for the first part of the year were so good that I had forgotten what high K indexes could do to a DX contest. Both the June ANARTS (Australian) and last month's SARTG (Scandinavian) suffered from high absorption on polar propagation. In the ANARTs the trans-equitorial paths were acceptable (a fact that did not go unnoticed by the Oceania stations) but overall, things were pretty slow from Washington. I listened to VKs working imaginary Europeans all night long but the morning westcoast opening produced only one lip-reading QSO with 4X6RA (who is usually very loud) and some rumors of Italian activity from the boys in the Southeastern U.S.

It looked like a dead heat between VK5RY and VK5RT with W5HBR holding his own on the stateside end (good luck, Vance). Unsettled geo-magnetic had little affect on long path. A22BW and ZS6PI came through on 20 meters between 0630 and 0730 GMT along with C21FS and VK9NS who were also putting in excellent signals to the westcoast.

To keep my blood pressure from bottoming out, Saturday afternoon FT8WA showed up on 7 Mhz and later, around 0500 the Pacific stations also had excellent 40 meter signals. As I watched the flux climb through the 90s during the week before the SARTG, I was hoping for excellent propagation. **(cont pg. 15)**

(CONTEST cont. from pg. 14)

Unfortunately, during the contest the "A" index held at 15 or higher and the "K" never dropped below 3. Although the SARTG with structured operating periods is an exception, WWV reports are usually a big help in planning rest periods and band strategy for maximum multipliers. Winning has to do with making the most efficient use of existing propagation.

TG9VT's QTH was hit by lightning the day before SARTG and the strike wiped out a linear, destroyed the finals in an ICOM 751 and damaged some antennas. WB5BHR also lost some band time to electrical storms and close hits. WB2EKK, AB0Y/4, K6WZ and W7MI were all looking good this year with AA5AU (ex WB9IVC/5) slightly ahead with 160-plus QSOs.

The European stations seemed to be doing much better than anything in North America. EA3OL, with a great signal on 20 meters, was giving out QSOs in the 340's at contest close while G4SKA, OH2AY, HB9BNP and SM4CMG were running a photo finish in the 260 range. TR8DX and 5L2JJ provided a nice treat for most of us on 20 meters around 2300 GMT and 9Y4VU, although unworkable from my corner of the U.S., seemed to be doing a land office business, Sunday on 15. Overcoming a 4-hour late start, HC5K piled up more than 350 QSOs and looked to be a pretty good bet for 2nd place. No surprise, the leader, 9HIEL was 150 contacts ahead of anyone else I heard during the last hour of the contest.

We put in over 12 hours beating the brush on 40 meters for 42 contacts, 31 of which were worked early Friday night. It was even worse on 80 and 15 with a QSO total of 10 on each band! Propagation was a little inconsistent but the real problem was lack of stations.

Obviously, a guy working at a rate with stations waiting for him five- deep, is not liable to show much interest in your suggestion that he QSY for a quickie on another band. If you keep checking back, you should be able to find a point where things slow down enough to make a band change for an easy multiplier and sound pretty good to him. The first W7 on 80 meters is worth just as much as the 5L2 on 20 and is heck of a lot more convenient to work. The station suggesting a new band should already know that the propagation is acceptable by a quick scan of CW or SSB on the proposed band. Don't count on his calibration. After a couple of unanswered calls, check the band. He may have missed the frequency and be calling you as much as 10 Khz off with no idea where you are! Average rate for a North American station during the SARTG was roughly one QSO every six minutes. Although a band change should only take a few seconds (you usually do not need the amp), even if you blow 5 minutes to log a single contact, it could be worth a couple of thousand points by the end of the contest! An unexpected benefit, other stations will sometimes become aware of the activity on the new band while you're working your COZY-DEAL station and join you for three or four additional contacts before you jump back to your main band. It is 100 percent predictable that a station who can QSY quickly will beat one that either can't or won't change bands!

The time caught up to us before we nailed down a sponsor for an October contest to take the place of the CARTG which will not be run this year. Next year we'll have an October RTTY test for sure... until then it's the W.A.E. on the 2nd weekend in November.

Two more operators have been added to the September CQWW contest effort to Galapagos: Roy, KT1N and Betsy, KE7PL. WA4WIP is talking about getting VP5 on the air and rumor has it that the Cocos, TI9 might be active for the contest. See you from HC8CQ!!

de Hal, WA7EGA

AFSK - PSK PHASING COMPARSION

See PACKET column

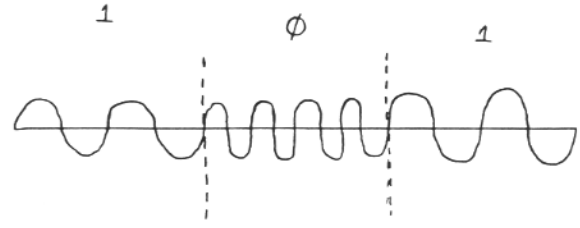

FIGURE 2

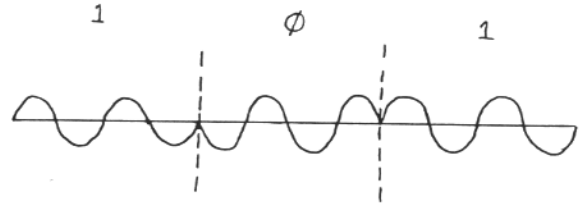

FIGURE 3

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

PACKET

Greetings from Southern California. My name is Richard Polivka, N6NKO. Danny Wilson, N6IHQ, has requested that I take over his column. Well, I have some pretty big shoes to fill and I want to thank Danny and Dale, W6IWO for the opportunity to write for the RTTY journal. I hope to keep the column to the standards that Danny has set and that I can improve on them as time goes by.

ON TO THE MEAT OF THINGS

What I have planned is just a start and where it runs from there will depend on you, the reader. I will be continuing the Beginner's corner. Added to that, I will be covering theory, operation, news and also answers to questions that have been sent in to me by you. Any one or a combination of sections may appear each month. It will depend on what is going on at the time.

Well, since there will be questions answered by me you need a way to get them to me. One way is to mail them to the above address. Another way is to contact me via Packet. My home BBS is WB6YMH-2 in Los Angeles, California. WB6YMH-2 is a major node on the WESTNET circuit so there should be no problem with getting mail there via HF or VHF. I will answer the more interesting questions that I have received in the column. Unfortunately, I may not be able to answer all the questions that I receive because of time and space. (ED: Suggest those writing to Richard include an SASE for a quick reply)

For the curious, the Packet station at N6NKO consists of a dumb terminal attached to a PK-232 data controller and feeding an ICOM 02-AT handheld with an amplifier on it. If necessary, the whole station, except for the terminal, can fit into a camera bag. The system was designed for portability. I realize that one of the laptop computers would make things more portable but I find the LCD displays hard on my eyes. I am planning to build an inverter to run the terminal off of 12 VDC and I will report on that little project in this column.

The reason for portability is that, in my own words, the Southern California area is a disaster waiting to happen when it comes to an earthquake. The ability for each Packet station to be a repeater is valued quite heavily here. Packet will be a reliable medium to augment emergency communications when it comes to sending long lists and traffic that needs to be semi-secure from prying ears. The state Office of Emergency Services has recommended to all emergency organizations in the state to use Packet in their communications schemes. Packet is not a panacea but it is another tool that is available to the amateur community as a communications medium. I was introduced to Packet radio by Danny, N6IHQ, during the Aeromexico plane crash here in Cerritos, California. We had used it to pass lists between the local Red Cross office in Long Beach, California and the Evacuation site. It proved its effectiveness as a communications tool to me then. So, let's promote it to the whole amateur community. Considering that there are RTTY contests, CW contests, SSB contests, EME contests, and all sorts of other contests that the amateur operator can participate in. maybe we need a Packet radio contest. (ED: Our new CQ magazine/RTTY Journal contest this month promotes this mode) It would be a way to promote the medium and to sharpen up operating practices. It is just an idea.

Danny, N6IHQ, handed me a letter that he received from Ted Double, G8CDW, who is the president of the British Amateur Radio Teleprinter Group. The letter from Ted describes two things that are going on over in England involving Packet.

The Digital Communications Experiment (DCE) involves relaying Packet traffic via OSCAR 11. The traffic is sent up to and received from the bird by a few Gateway stations located around the world. GB3UP is located in Guildford, Surrey, England and is capable of receiving and transmitting traffic to the majority of the mailboxes in England. NK6K, Redondo Beach, California, is a major node in the WESTNET Packet system on the west coast of the United States. Most US mailboxes can be reached by NK6K via HF links. VK5ACR, Adelaide, Australia, is connected to most of the mailboxes in VK land via a combination of HF and VHF links.

There are two more Gateway stations planned to be installed as part of the DCE. One will be somewhere along the EASTNET system on the east coast of the United States and at ZL1AOX in New Zealand. This system is completely manual in operation so there will be delays in passing the traffic along the link. There are a couple of things to remember when using this system. one is to keep your messages informative. Lines of *** or --- are not

(cont. pg. 17)

(PACKET cont. from pg. 16)
informative and take up precious memory space. Also, before sending a message on the link, contact the Gateway operator as to how to format the message for his particular station.

The second item is a chart of repeaters that are in England that carry data transmissions. There are about 20 listed (see Chart 1). There are four frequencies in use based upon this. The frequency for channel P1 is 144.650 Mhz. RB12 relates to other data repeaters that use a +/- 600 Khz split. I want to thank the RSGB, the BARTG, and Ted, G8CDW, for this information.

PSK

For anyone who has used digital communications, you have heard that the binary data is converted into a series of tones that represent the data. One frequency represents a **1** and the other frequency represents a **0** (zero). RTTY uses 2125 Hz and 2295 Hz (170 cycle shift) for the frequencies and VHF Packet uses the frequencies 1200 Hz and 2200 Hz with HF Packet using the frequencies 2110 Hz and 2310 Hz. The technical name for this form of transmission is called Audio Frequency Shift Keying (AFSK). There is another form of data transmission that is now being used for Packet and it is called Phase Shift Keying (PSK). PSK is used for the data transmission to and from FUJI/OSCAR 12. Instead of using two discrete frequencies, as in AFSK, there is only one discrete frequency used and the data is sent by changing the phase of the carrier tone 180 degrees to represent the input data changing states from a 1 to a 0 (zero) and vice versa. Figure 2 is a graphic representation of the sequence of 101 in AFSK. The **1** is sent by the low frequency and the **0** is sent by the high frequency. Figure 3 shows the waveform of a PSK encoded signal. You will note that the frequency stays the same but that the phase of the signal changes 180 degrees to represent the change in the input data state. With PSK, there has to be a way to determine which phase is a **1** and the other is a **0**. One way is to mix in the **TXCLOCK** with the **TXDATA** to provide a reference for the demodulator to lock on and decode the signal into binary data stream. This type of PSK is called Manchester Encoding. The demodulator uses digital circuitry to extract the data and has less components than a limiter-discriminator-slicer demodulator. There have been several articles in print on the subject of PSK modems lately with the advent of FUGI/OSCAR 12. There are several kits that are available for the amateur to experiment with this form of data transmission. I am planning to try out PSK myself and I shall report on the results to you and I would like to hear from you also with your own results.

Well, that is it for this month. Next month we will continue with the Beginners Corner and continue to delve into the increasing world of Packet Radio. So until then, 73 and BRRRAAAAAAAAAP!

de Richard, N6NKO

ED: We welcome Richard to the Journal staff of writers. I hope many of you will write to Richard and stimulate the type of articles you like to read concerning Packet radio. Richard is married and his wife's name is Vickie. His primary operation consists of VHF digital (RTTY and Packet) and 440 voice. He studied at Michigan Technological University in Computer Science and Electrical Engineering. The station equipment consists of the following: ICOM 02-AT, Santec ST-7/T 440 HT, PK-232 all mode data controller, and a Datamedia Elite 250 terminal. Since he lives in an apartment, he has a problem with outside antennas, and is therefore not on HF yet.

CHART #1

ENGLAND DATA REPEATERS

CALL	CHAN	LOCATION	QTH	CONTACT	TYPE
GB3AP	P1	Dudley, West Midlands	IO82WM	G4TEC	Packet
GB3AX		Hertfordshire- proposal		GEOUF	Packet
GB3BP	P1	Bristol, Avon	IO81RL	G8IMB	Packet
GB3CD	P1	Crewe, Cheshire	IO83TF	G4BVE	Packet
GB3DB	P1	Honiton, Devon	IO80KT	G1DII	Packet
GB3DP	P1	Weymouth, Dorset	IO80SQ	G3VPF	Packet
GB3EP	P1	Exeter, Devon	IO80FP	G4WJZ	Packet
GB3GM	RB12	Paisley, Renfrewshire	IO75SQ	GM3SAN	Data
GB3HP	P1	Winchester, Hants	IO91LB	G4RT	Packet
GB3HQ	P1	RSGB HQ, Potters Bar	IO91VQ	G3OUF	Packet
GB3JP	P1	St. Helier, Jersey	IN89WG	GJ6ENP	Packet
GB3KP	P1	Kingston- upon - Thames	IO91UK	G8LWY	Packet
GB3MT	RB12	Bolton, Lancs	IO83RO	G8VLJ	Data
GB3MX	RB9	Mtherwell - proposal		GM8JYJ	Data
GB3NP	P1	Norwich, Norfolk	IO91QF	G8QR	Packet
GB3PT	RB12	Barkway, Herts	IO92XA	G8XMS	Data
GB3RY	RB12	Leicester	IO92KP	G4MQS	RTTY/DATA
GB3UP	P1	U of Surrey, Guildford	IO91RF	G3YJO	Packet
GB3XP	P1	New malden, Surrey	IO91VJ	G8GGI	Packet
GB3YP	P1	Harrogate, N. Yorks	IO94DF	G4SHJ	Packet

BARTG HF SPRING CONTEST RESULTS 1987

	SINGLE OPERATOR	SCORE
1	KT1N	678,280
2	I0OLW	624,690
3	WB5HBR	452,816
4	G4SKA	375,348
5	PT2BW	359,996
6	I1BAY	318,804
7	NG7P	306,560
8	W2FG	292,160
9	A22BW	243,100
10	W1AX	218,356
11	Y79XN	211,616
12	VK5RY	200,832
13	KB4SID	192,504
14	OE2DAN	192,384
15	G4PKP	188,288
16	SP9BCH	177,600
17	I2WEG	177,520
18	W8MQK	174,704
19	G0ATX	172,494
20	LA7AJ	165,120
21	HB9BNP	155,648
22	W6JOX	152,134
23	VE6ZX	149,940
24	HA6VV	142,680
25	OH2LU	133,770
26	VE1TE	132,294
27	ZC4JA	127,512
28	I5HZZ	110,348
29	W7MI	110,220
30	JF4GJB	108,758
31	W6IWO	103,992
32	DJ2YE	103,836
33	HB9HK	100,240
34	IV3UT	98,696
35	KA2BHD	98,210
36	ZL2AKI	92,400
37	I2KYM	92,192
38	EA1AW	83,300
39	G3SJX	82,170
40	DL3YBL	81,270

	SINGLE OPERATOR	SCORE
41	YO2IS	81,072
42	YB5NOF	78,012
43	I6KYL	66,740
44	N2EFR	62,010
45	HA5CP	61,488
46	VK2BQS	60,388
47	Y27AO/A	57,664
48	G4MKO	54,694
49	IK2FAD	53,856
50	SP2UUU	53,620
51	G0GGR	52,700
52	GW3EHN	52,170
53	LZ2OV	50,864
54	SM5AAY	50,680
55	EA7CPX	49,600
56	VK2EG	48,856
57	KI4MI	48,480
58	PA3DBS	48,400
59	IK2ECX	45,500
60	YU7AM	44,064
61	W3AOH	40,986
62	SM7AIO	37,620
63	IK2FEO	37,314
64	VE7YB	35,006
65	G4UZN	34,722
66	VE3ST	34,278
67	IK6HJW	32,800
68	LX2CP	31,680
69	JA1DFQ	31,488
70	Y58VA	31,186
71	Y21DG/A	30,624
72	G0BRY	27,960
73	WA6WGL	27,368
74	K8CV	27,270
75	VE2QO	27,200
76	DL8MAF	26,052
77	Y22HF	25,694
78	Y21RO	24,624
79	W0TIV	23,834
80	W8LNK	23,000

	SINGLE OPERATOR	SCORE
81	IK0AAC	20,900
82	SM7BGE	20,790
83	KT7H	19,832
84	GM4VDI	19,136
85	Y25NL	19,072
86	DK5KJ	16,146
87	SM5FUG	16,050
88	OH5VL	15,320
89	PY7JJ	13,048
90	G4JLU	11,160
91	HA-6-VX	10,880
92	CT3KO	10,080
93	HA1WD	9,480
94	WT4O	8,250
95	Y23NE	7,500
96	YO2DNO	6,608
97	VE3FEA	5,852
98	Y67RG	5,680
99	W8TCO	5,664
100	CT1AUR	5,600
101	W2JGR	5,460
102	Y26AO	3,514
103	KA1LMR	3,200
104	YU3MJ	3,060
105	Y23WO/A	2,540
106	W6OWQ	890
107	Y84WL	868
108	WA3JXW	844

The Contest Manager gratefully acknowledges Check logs from the following stations: G0EFB, G0FDU, EA8AKQ, PASBFN, WA3ZKZ, HA1VQ, UT4UW,UZ6AWF, SP2ZCD, Y23WI, Y43ZB, HA8AL, HA8BI, WA9TMU, NQ2O

	MULTI-OPERATOR	SCORE
1	WA7EGA	689,920
2	HD8G	610,542
3	VP2EDX	438,070
4	LZ2KIM	362,404
5	OH1AF	329,380
6	G3SDC	318,888
7	LZ1KDP	231,552
8	HA6KVD	200,736
9	N2WK	199,060
10	OK2KII	188,110
11	IK4BWC	159,544
12	OK3KGI	142,956
13	OK3RJB	107,802
14	OK1KRY	72,324
15	UZ0FWI	64,464
16	Y51ZF	45,084
17	Y33ZK	33,720
18	YU7KMN	20,944
19	LA3T	15,002
20	OK3KSK	14,644

	SWL	SCORE
1	ONL383	353,096
2	G8CDW	181,746
3	G6LAU	112,042
4	Y78-14-L	110,484
5	BRS86650	105,938
6	F11ADB	102,752
7	Y64-11-I	61,560
8	IW5AFB	57,890
9	Y48-09-0/P	54,670
10	DE1EFH	51,336
11	Y34-05-F	28,690
12	Y39-01-E	23,760
13	Y56-01-F	18,734

CONTEST RESULTS SUBMITTED BY TED DOUBLE, G8CDW, CONTEST MANAGER

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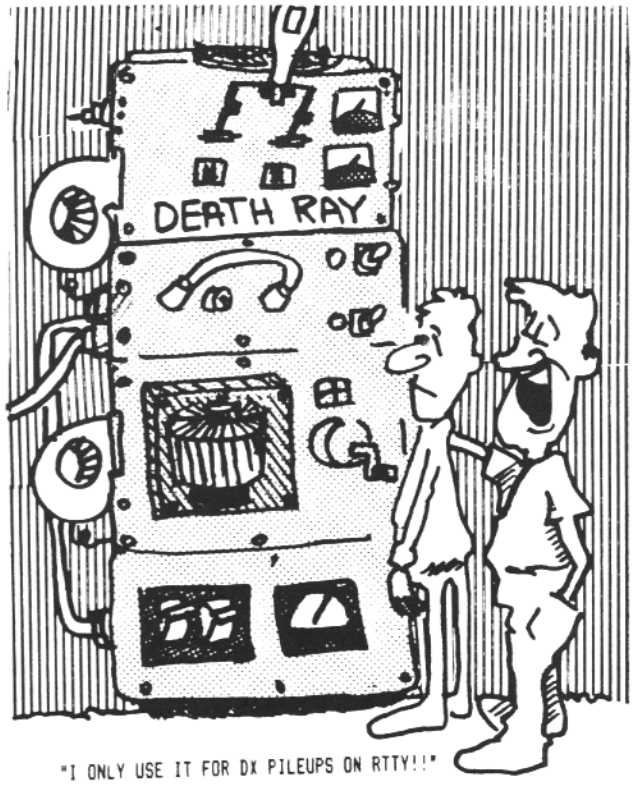

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