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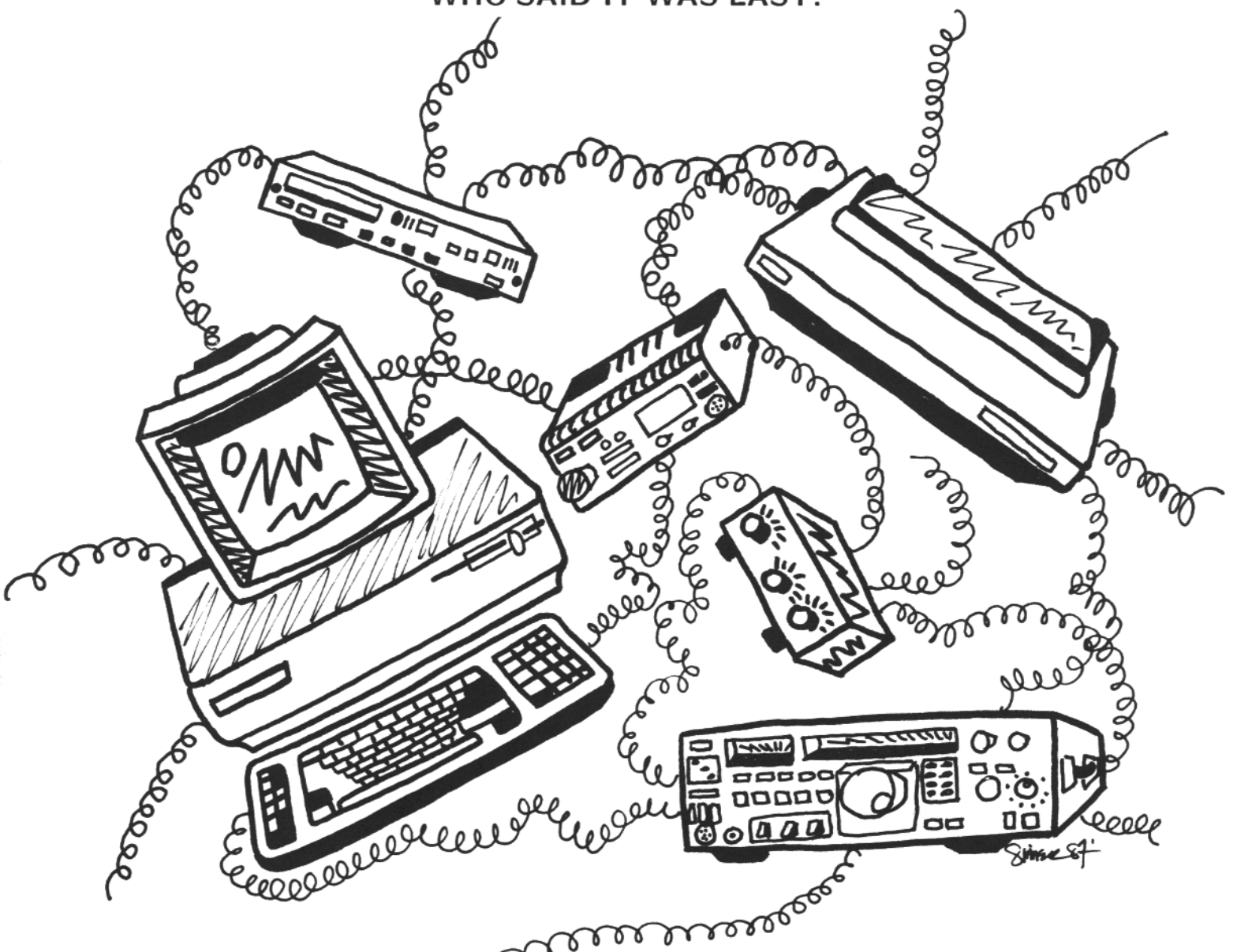
# RTTY JOURNAL

AMATEUR RADIOTELETYPE - COMPUTERS - PACKET

VOLUME 35 NUMBER 1 JANUARY 1987

# CONNECTIONS

## WHO SAID IT WAS EASY!



IN THIS ISSUE

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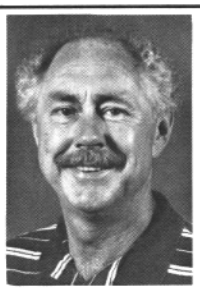
## ABOUT THE COVER

The headline might imply something sinister were it not for the picture just below it. Connections are not always easy even though the manufacturer may lead you to think so. You get the gear home and then the fun **STARTS!**



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## HITS & MISSES

The beginning of a new year always seems to signal a new start. We go on diets, start special savings plans, make resolutions, and so on. And so with the Journal we are going to make a fresh start. Nothing spectaular is going to take place though. What we intend to do is work on training. Many letters have been received by the Journal and our columnists have also received numerous letters, all on the subject of how to connect things up. If you pick up any one of the other publications about our hobby you see the same inquiries. WHAT TO DO??

This year we going to devote space to the subject of how to 'hook' things up. Cole Ellsworth, W6OXP will be writing a series of articles on this subject. Danny Wilson, N6IHQ will doing some columns on hooking up to Packet Radio. Dick Uhrmacher, K0VKH has written many articles on tips connected to MSO's and has a complete technical library on disk in his own MSO. Roy Gould, KT1N no doubt will have some words about the use of AMTOR on the bands. So, whether we are hooking up equipment or just hooking up with someone on the air, we want to share the latest with you.

(HITS & MISSES cont. pg. 9)

*ED: This article will begin a series of articles written by Cole Ellsworth, W6OXP. I have known Cole for many years and I can assure you he is a very knowledgeable person. He is looking forward to writing for the Journal and is asking for your help. He wants to know what you want to know. So this is your chance. Write to Cole and help him decide on what subjects to write about. Cole and I have discussed some of the many questions that come into the Journal about how to hook pieces of gear up. Cole is going to start in that direction but would also like to hear from you the reader. Don't let him down, write to him today about your problem or ask your question. This is a great opportunity to find an answer and at the same time maybe help others who may have the same problem.*

# CONNECTIONS

Cole Ellsworth, W6OXP
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This is the first of a series of articles on connecting various items of radio equipment together to form a working system. I will start with generalities such as serial and parallel connections or interfaces. The Dictionary of Electronics defines interface as: (1) " A point or device at which a transition between media, power levels, modes of operation, etc., is made" or (2) "The two surfaces on the contact sides of mating connectors that face each other when mated". If readers are interested, we can go on to specific types of equipment connections in the following months. This month's article will discuss the serial data connection.

## SERIAL INTERFACES

There are many types of serial interfaces. For example, the teleprinter current loop is a serial interface where each current or no-current (mark or space) period in time is one bit of information, one after the other in time. Instead of current driven circuits, one can use a voltage controlled circuit where the intelligence is conveyed by the presence or absence of a voltage, say 5 volts and zero volts. These two levels of voltage can still represent marks and spaces over a period of time. In either the current loop or voltage level case, the advantage of a serial interface over a parallel interface is that only one pair of wires is required for the transmission of data between two separate items of equipment. Parallel interfaces commonly require nine or more signal lines plus a common line to transfer data.

## RS-232-C

One commonly used serial voltage level interface has been standardized by the Electronic Industries Association (EIA) and has been designated the RS-232-C Serial Binary Interchange Standard. This is a bi-polar voltage scheme where a positive voltage represents a space and a negative voltage represents a mark for data transfer (TD & RD) lines. If the interface line is used for control, then the positive voltage represents the true or ON condition of the control function and a negative voltage signifies the False or OFF condition of the control function. The RS-232-C standard specifies the voltage limits as negative 25 volts to negative 3 volts and positive 3 volts to positive 25 volts. A voltage level between plus and minus 3 volts is an undefined condition or forbidden area. Many manufacturers of equipment with RS-232-C use plus and minus 12 volts as the bi-polar voltages. The Standard defines not only the electrical characteristics of the interface, but also the mechanical characteristics by assigning a signal function to a specific connector pin. Table 1 lists each connector pin with its associated EIA circuit designation, a description of the signal function, and whether it is for a data line or control or timing. Note that a column called CCITT (an international standards body) V.24 shows the international circuit designation. V.24 is very similar to RS-232-C, the major difference being the name or reference number of the signal. The references in the table to DCE (Data Communication Equipment) and DTE (Data Terminal Equipment) are the designations of equipment that may be at either side of the interface. You can think of DCE as being a wire-line Modem or a radio modem such as a Packet Radio TNC (Terminal Node Controller). The DTE can be thought of as a CRT (Cathode Ray Tube) Terminal or a Computer or a Printer.

## THE RS-232-C CONNECTOR

Figure 1 shows the pin outline of the standard RS-232-C connector with circuit description. Electronics catalogs refer to DB-25S as the socket and DB-25P as the plug connector. Figure 1, as shown is a rear (solder side) view of the socket or the front view of the mating plug. While most connectors have the pin numbers molded into the base, they are very small and hard to see, especially for "older" eyes.

(CONNECTIONS cont next pg.)

(CONNECTIONS cont.)

## REAL WORLD CONNECTIONS

About this time you are probably trying to reconcile my earlier comment about the advantage of a serial interface being the requirement for only one pair of wires, with the somewhat bewildering array of 25 pins and associated circuits shown in table 1 and figure 1. One of the curses of a standard is that, in order to get anyone to use it, it must be everything to everyone. So you use only the circuits or signal lines that you need for your specific application. For example, if you have a printer connected to a host such as a computer, and if the printer can print at a rate of up to 4800 baud before needing flow control, and if the host and printer are both set to say 2400 baud, then the computer can send data to the printer over just two wires- transmit data and common return. If you need software control then you have to add the third wire so the host can receive the busy status from the printer. At the host end, this third wire is called receive data. If, instead of software flow control you need hardware handshaking, you might connect pin 20 DTR from the printer back to say pin 6 DSR at the host in place of receive data but you still only need three wires. However, some equipment such as Modems in certain applications may require that pins one through eight and pins twenty and twenty two be connected for some types of circuits. Only very specialized applications require that more than ten pins be utilized.

## THE STANDARD CASE: TERMINAL TO MODEM

Figure 2 is a sketch of a terminal (DTE) such as an IBM PC Asynchronous Communcations Adaptor connected to a Hayes 1200 Modem (DCE). This shows the absolute minimum number of wires needed for the connection. It should be noted that the configuration of pins and signals in figures 2 and 3 are from the RS-232-C Standard. Many manufacturers may deviate from this standard to suit their own purposes. The way it is shown here is the way it should be. But, use the equipment manual setup if it is given.

## THE NULL MODEM CASE: TERMINAL TO TERMINAL

Figure 3 is a sketch of the connections between an IBM PC (DTE) and a printer (also DTE). Note that pins two and three are transposed or "crossed over" to get the proper send and receive data connections. This cross over is called a "Null Modem" or "not modem" connection. Null Modems are usually required when connecting two DTE together.

## TESTING AND TROUBLESHOOTING THE RS-232-C INTERFACE

One of the most useful and least expensive test tools you can have is the RS-232 tester shown in figure 4. It consists of seven bi-polar LEDs that glow red with a negative voltage and green when connected to a positive voltage on the interface line. Just insert it in the line and you will immediately see the status of Receive Data (RD), Transmit Data (TD), Request To Send (RTS), Clear to send (CTS), Data Set Ready (DSR), Carrier Detect (CD, also known as Received Line Signal Detector), and Data Terminal Ready (DTR). This tester is available from many sources with prices ranging from $12.95 to $30.00. Some may not be the red/green type of LED so check before you buy, although the plain red LEDs are still very useful as indicators.

## WHY WON'T THE SILLY THING WORK? (OR PRINT, OR PLAY, OR ?)

One of the most common problems when tying two pieces of equipment together with an RS-232-C interface is non-matching baud rates. Always double check each set-up parameter with your manuals and with the eqiupment. Most modern gear have programable parameters (values) for baud rate, number of bits, parity or none, number of stop bits, and for flow control protocols (rules of operation). All it takes is one parameter that does not match on both sides of the link to cause data transfer failure. Last but not least is to ALWAYS read the manual, especially if all else fails! For a detailed look at RS-232, I can heartily recommend *"RS-232 Made Easy"* by Martin D. Seyer. It is the best text I have ever seen for introducing someone who is new to data transmission to the mysteries of RS-232-C.

REFERENCES: Electronics Industries Association, EIA Standard RS-232-C, Washington, D.C.: 1969.

BIBLIOGRAPHY: Seyer, Martin D. "RS-232 Made Easy"- Englewood Cliffs, NJ. Prentice-Hall, Inc., 1984.

Tugal, D. and Tugal, O. "Data Transmission"- New York, NY. McGraw-Hill, 1982

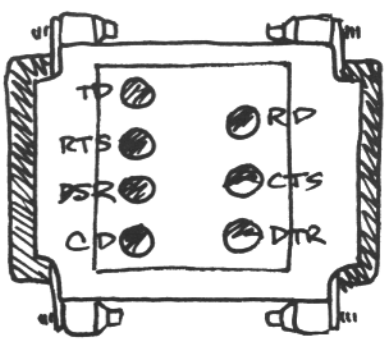


Fig. 4

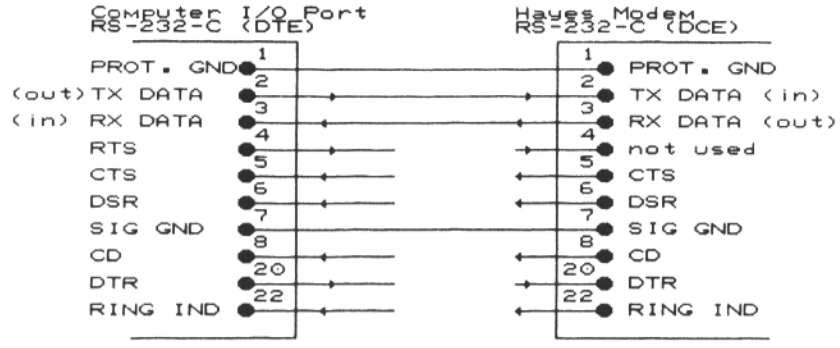


FIGURE 2. Computer to Modem 4-wire Connection Using Software Flow Control.

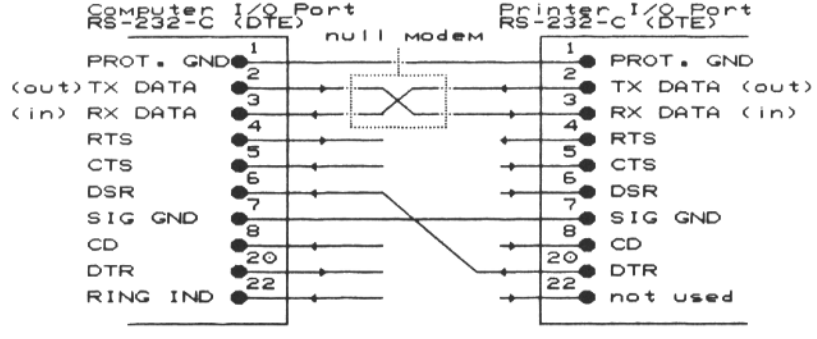


FIGURE 3. Computer to Printer 5-wire Connection For Both Software and Hardware Flow Control

**RS-232 Interface**

| 25 PIN | EIA-RS232C CIRCUIT | CCITT-V.24 CIRCUIT | RS232 DESCRIPTION | GND | Signal Type & Direction: DATA From DCE | DATA To DCE | CONTROL From DCE | CONTROL To DCE | TIMING From DCE | TIMING To DCE |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | AA | 101 | Protective Ground | X | | | | | | |
| 7 | AB | 102 | Signal Ground/Common Return | X | | | | | | |
| | | | | | | | | | | |
| 2 | BA | 103 | Transmitted Data | | | X | | | | |
| 3 | BB | 104 | Received Data | | X | | | | | |
| 4 | CA | 105 | Request to Send | | | | | X | | |
| 5 | CB | 106 | Clear to Send | | | | X | | | |
| 6 | CC | 107 | Data Set Ready | | | | X | | | |
| 20 | CD | 108.2 | Data Terminal Ready | | | | | X | | |
| 22 | CE | 125 | Ring Indicator | | | | X | | | |
| 8 | CF | 109 | Received Line Signal Detector | | | | X | | | |
| 21 | CG | 110 | Signal Quality Detector | | | | X | | | |
| 23 | CH | 111 | Data Signal Rate Selector (DTE) | | | | | X | | |
| 23 | CI | 112 | Data Signal Rate Selector (DCE) | | | | X | | | |
| 24 | DA | 113 | Transmitter Signal Element Timing (DTE) | | | | | | | X |
| 15 | DB | 114 | Transmitter Signal Element Timing (DCE) | | | | | | X | |
| 17 | DD | 115 | Receiver Signal Element Timing (DCE) | | | | | | X | |
| 14 | SBA | 118 | Secondary Transmitted Data | | | X | | | | |
| 16 | SBB | 119 | Secondary Received Data | | X | | | | | |
| 19 | SCA | 120 | Secondary Request to Send | | | | | X | | |
| 13 | SCB | 121 | Secondary Clear to Send | | | | X | | | |
| 12 | SCF | 122 | Secondary Received Line Signal Detector | | | | X | | | |

Table 1

**RS-232 Interface**

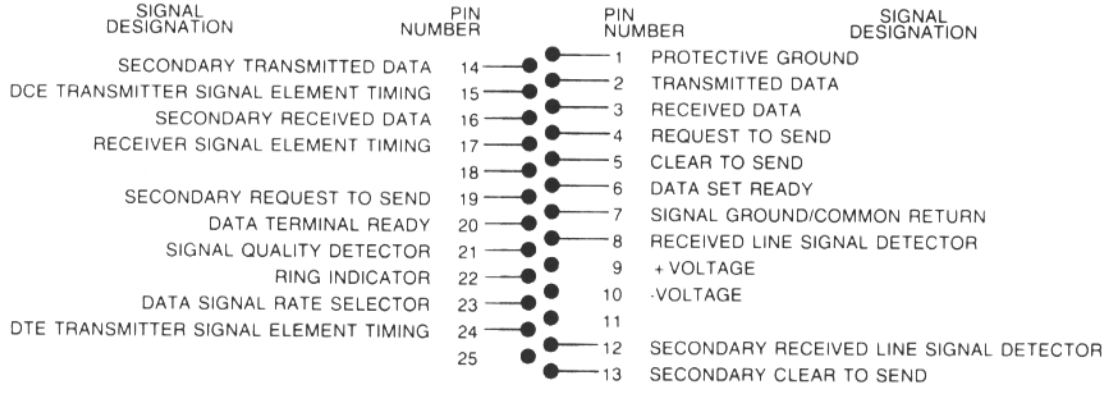


Fig. 1

## Or This Inexpensive

# It Really Shouldn't Be This Easy

Remember just a few years ago, how it took a roomful of equipment just to work RTTY. And if you wanted more than one mode it took a dedicated computer system costing thousands of dollars. The new AEA Pakratts are proving it doesn't take lots of equipment or money to enjoy working all bands in five different modes.

### First, A Good Idea

The idea behind the Pakratt is very simple. One controller that does Morse, Baudot, ASCII, AMTOR, and Packet, and works both HF and VHF bands. Of course the decoding, protocol, and signal processing software must be included in the unit, and connection to the computer and transceiver have to be easy. The unit also has to be small and require only 12 volts, so it will work both in the shack and on the road.

### Second, Computer Compatible

It doesn't matter what kind of computer you have, we have a Pakratt for you. The PK-64 works with the popular Commodore 64 or 128, and the PK-232 works with any other computer or terminal that has an RS-232 serial port. The PK-64 doesn't require any additional programs. Simply connect to the computer and transceiver and you're on the air. The PK-232 needs a terminal or modem program for your computer. The one you're using with your telephone modem will work just fine.

## PAKRATT™ Model PK-64


## PAKRATT™ Model PK-232

### Third, Performance and Features

The real measure of any data controller is what kind of on-air performance it gives. While the PK-64 and PK-232 use different types of modems, both give excellent performance on VHF. The optional HF modem of the PK-64 uses independent four-pole Chebyshev filters for both Mark and Space tones, and A.M. detection. The HF option can be factory or field installed.

The PK-232 uses an eight-pole bandpass filter followed by a limiter discriminator with automatic threshold correction. The internal modem automatically selects the filter parameters, CW Fc = 800 Hz, BW = 200 Hz; HF Fc = 2210 Hz, BW = 450 Hz; VHF Fc = 1700 Hz, BW = 2600 Hz.

The PK-64 uses on screen indicators to show status, mode, and DCD (Data Carrier Detect) while the PK-232 uses front panel indicators. Both units use discriminator style tuning for HF operation. And that's just the tip of the iceberg. Features like multiple connects on packet, hardware HDLC, CW speed tracking, and other standard AEA software features are included in both the PK-64 and PK-232.

### Fourth, AEA Quality and Price

Not many manufacturers like to discuss quality and price at the same time. AEA thinks you want high quality and low price in any product you buy, so that's what you get with the Pakratts. Ask any friend who owns AEA gear about our quality. The people who buy our products are our best salespeople. As for price, the PK-64 costs $219.95, or $319.95 with the HF option. The PK-64A, an enhanced software unit with a longer flexible computer cable, costs $269.95 or $369.95 with the HF option. The PK-232 costs $319.95 with the HF modem included. All prices are Amateur Net and available from your favorite amateur radio dealer. For more information contact your local dealer or AEA.

Prices and specifications subject to change without notice or obligation.


**AEA** Advanced Electronic Applications, Inc.
P.O. Box C-2160, Lynnwood, WA 98036-0918
206-775-7373 Telex 6972496 AEA INTL UW

Danny Wilson,N6IHQ
4818 Pearce Ave.
Long Beach,CA.90808

## PACKET

In this month's column, I would like to acknowledge some of the pieces of mail that I have been receiving, discuss some HF packet settings, and do a brief update on the FUJI satellite.

To be honest, the mail has been coming in rather slowly. I figure the holiday season has a lot to do with the number of times one visits the local U. S. Post Office to mail something other than Aunt Ethyl's Christmas card. However, I hope with the holidays behind us, I will be hearing from more of you. If you would like to use the Packet BBS forwarding system to leave a file, comment, info for the column, etc., please forward it to the NK6K-2 PBBS. I did receive a very informative letter from Rick Witing, W0TN. Some of his comments I will share with you when I discuss HF in this column and a future column will revert back to the letter when the topic will be about TNC's. A few of you have written and asked for a beginner's column. Next month I will be adding a beginners corner to the regular column. This will deal strictly with the basics of packet. Hopefully with a section just for beginners, the column will pique an interest in the person not involved with packet, and at the same time not bore an experienced operator. But for now, on to HF.

If you currently operate packet on VFH and decide to make the transition to HF, be prepared for a little work, more regulations, slower baud rate, and rigorous tuning sessions. But once the set up is operating the rewards are well worth the effort. Re-calibration of the modem tones is required on a number of TNC's and in other applications an 'HF' modem kit is required. Check your TNC's owners manual for the proper procedure in converting the TNC to operate on HF. A couple of regulations to observe is the speed at which packets are transmitted, they cannot exceed 300 baud. Also digipeating is not allowed. Also, with packet, tuning a signal can be one of the most ego crushing, nerve rattling experiences one can sugject himself to. Packets by design are very short in duration and trying to tune one of these "Super-duper-state-of-the-art, mortgage-the-house-to-buy-one" HF rigs to a signal that only lasts a second or two can be a real challange. However, the good folks at TAPR* (Tucson Amateur Packet Radio) offer a little device called an "HF Tuning Indicator" that is easily installed in the TNC. With the use of an L.E.D. display, the indicator operates much like the AEA CP-1. With this device tuning packets is made much easier. (Right Dale?) In Rick's letter, he included some suggestions for the TNC settings when operating HF Packet. In TAPR command language they are as follows: DIGIpeat Off, FRack 10 sec. (min.), Maxframe 1, Paclen 40 (max.), and Beacon 0. These settings concur with an attempt to keep what little operating frequencies available to the Packet operator as uncluttered as possible.

At the time of this writing, the FUJI Oscar 12 satellite is beaconing data frames from space. The reception of this data is going very well. (about 100 Kbytes of data received per pass.) The new modem kits for accessing the satellite for the TNC's will be available soon (from TAPR), so don't hesitate if you plan on using the capabilities of a mailbox in space. (The life expectancy of the craft is only 3 years!) If you don't have the desire to run satellite gear at the house, you might check your local packet network and see if there is a station that is being utilized as a gateway to the spacecraft. The word on the date of the satellite being opened up for general amateur usage is still set around the first of 1987. So who knows? Maybe by this time next month the Packet radio community will have a very viable shot at worldwide communications in a non-real time basis. If you have the opportunity to use the satellite, please drop a note and tell of the experience and your observations as I would like to include them in the Journal.

While typing the articles on the computer, (which is incidentally, in my shack), I have an opportunity to observe the packet activity via the LED's on the front on my TNC, the S meter, and also low speaker volume. At this moment, someone is using a mailbox located nearby, via 2 digipeaters while downloading a long file. (now don't think I'm,,crazy ... you CAN tell all that stuff if you watch and listen enough!). All that is fine, but the operator is doing this during a peak operating period. Downloading a long file is bad enough during a peak usage time-frame, but the length of time taken going thru 2 digipeaters triple the frequency traffic and therefore the throughput for everyone is severely hampered. Some operating tips for BBS usage would be: 1. If possible, only use a BBS if you can hit it directly. Use the store and forward features of your local BBS to send traffic to a distant system. 2. If you really want to obtain files from that far away BBS, do it at a time when the frequency is relatively slow.

(PACKET cont pg. 15)

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57702

## MSO'S

Hi Gang! A very Happy New Year to each of you , and I hope that 1987 is a healthy, happy and properous New Year! And, I trust that Santa was kind and benevolent to each of you, and the blisters from twiddling all of those new dials and knobs heal soon!

### RTTY TECHNICAL INFORMATION

1. Some users of the Hal DSK-3100 Disk Drive system have reported for some time, unexplained and difficult to diagnose disk "crash" problems. Others have used their DSK-3100's without any difficulties at all. There have been several different suggestions on how to eliminate these frustrating happenings, most of which were not effective. However, at this point I'm happy to report that Clark, W9CD, of Urbana, IL, has developed what appears to be a permanent fix for this problem. Several of the stations on the National Autostart Frequency on 20 Meters have completed Clark's modification on some very troublesome units, and without exception have eliminated this problem. This information is contained in the K0VKH Technical Data Library, (Page 50), and the significant part of Clark's suggested modification is as follows:

"The HAL DSK-3100 has been known to develop strange problems. New or revised data entered on a disk causes loss of disk data, and the error "BAD DSK" to appear of the "Status Line". Inspection of the disk reveals garbage overwriten on the "directory" data portion of the disk, and at times, erasure of "track" and "sector" marks in the directory area. Detailed review of firmware and hardware has not found any causes for these occurences. By random experimenting, (and pure luck), an apparent cure for this problem has been found. This modification follows:

Reroute the ribbon cables connected to the rear center of the DSK system PC-Board so that such cables cover only a minimum small area of this board, at the rear right-hand corner. Stuff the excess cable lengths down into the rear of the cabinet. That's all there is to it.
"Comments: The initial thought was that the bulky folds of the cable were restricting air circulation, allowing excessive temperature buildup in components on the disk Controller Board. However, improvement was so dramatic on an especially troublesome unit, that it seems likely that other things were involved, such as unexpected coupling between cable conductors and sensitive board circuits, or possibly marginal or temperature sensitive contacts in the ribbon cable connector." "Additionally, the ribbon cable going to the Disk Drive #1 PC-Board, (located immediately under the main Disk Controller PC-Board), is routed beneath Drive #1, instead of between the main Disk Controller PC-Board and Drive #1. This cable was most likely re-routed during repair procedures at the factory, and may, or may not contribute to better drive system operation."

2. As reported earlier in this column, the new Kenwood TS-440S SSB Transceiver, is especially adaptable to RTTY service. And, a little known feature of this very sophisticated unit, is a standard, built-in computer "Test" feature, that allows the user to test many of the transceivers internal circuits. This "Test" feature is not outlined in the TS-440S Operators Manual, but is outlined in the TS-440S Service Manual. The "Test" feature scrolls through fifty-six individual systems in the TS-440S, and is quite valuable in troubleshooting this transceiver. The TS-440S Service Manual is available from Trio-Kenwood, or from your favorite Ham Radio Dealer, and is indispensable in troubleshooting this transceiver.

### NEW MSO ON NATIONAL A/S FREQUENCY

I'd like to take this opportunity to welcome Don, (WB8ZTV) and Kathy, (N8EDL), to the National Autostart Frequency. Both Don and Kathy have been quite active in Amateur Radio for many years, including such modes as 10 Meter FM, RTTY, AMSAT activites, etc. Don and Kathy live in Moundsville, West Virgina, and access to their MSO is MSOZTV. Give their MSO a bump, and meet some nice folks!

### CORRECTION, K4CZ AMTOR MSO:

The AMTOR MSO "activities code" for the K4CZ MSO was incorrectly listed in a recent issue of the MSO Column. The correct activation code is: CZZW. Thanks to Russ, K1DOW/4 for this information.

### 1987 DAYTON HAMVENTION
### " RTTY DINNER "

Yes, believe it or not, it's time to think about the 1987 Dayton Hamvention, and the event of the year ..... **the RTTY Dinner!** (cont. pg. 9 )

(MSO's cont, from pg. 8)
This years extravaganza is being hosted by the International Mailbox Frequency, (Mark frequency 14 097 500 Hz), and the cheif mogol is none other than Jerry, WA1IUF. As in years past, all RTTY'ers are more than welcome at this prestigious event, held at approximately 1830 hours, on Saturday night, during the Hamvention. This years dinner will be held at the Radisson Inn Dayton, (the old Imperial House North), I-75 and Needmore Road, in what used to be called "The Italian Room". Attendance is limited to approximately fifty-five guests, and reservations can be made via the WA1IUF MSO on the 14 097 500 Hz, as well as either the K4KOZ or K0VKH MSO's on the National Autostart Frequency, (Mark is 14 085 625 Hz). The popularity of this event continues to grow each year, and I would encourage those who desire to attend to register early!

### AMTOR MSO

Russ, K1DOW/4 reports that he has worked another DX AMTOR MSO, that of Roy, HB9BJJ, from Zurich, Switzerland. This system can be found on 10.142 and 10.146 Mhz, about 2300 UTC. Thanks Russ!

### MSO RAMBLINGS

**Don, W5QXK**, reports that he has acquired another HAL MPT/MSO system, and he will again be active with his MSO from the Dallas area.
**Larry, KA0JRQ**, reports that his new HAL ST-8000 Demodulator is nothing less than superb in geting down into the noise and digging out those elusive tones. It's RTTY DXCC for sure now!
**Al, N1API**. If the "digital display" on your TS-940S tends to flicker on and off when you first turn the rig on, contact Al, N1API, (via his MSO), as he has had some experience in curing this ailment.
**Clark, W9CD**, reports that he has made some improvments to his IBM-PC "MSO Program", and those interested in updating their programs, (or obtaining a copy of this very sophisticated program), should contact him directly.
**Bob, W7IQO**. It's not only tones of 2125 and 2295 Hertz that eminate from Scootsdale, AZ! Bob, W7IQO (MSOIQO), owns and operates the "Jazz Bird" recording studio there, and can speak that language with eloquence!

That's it for this month Gang! Take care in 1987, and let me hear from you! This is YOUR column, and your chance to utilize a forum for your likes, dislikes, technical information, AMTOR MSO's, etc. --73-- de Dick, K0VKH

### RTTY BANDPASS

| CALL | FREQ | TIME | DATE |
|---|---|---|---|
| 4X4KF | 14.090 | 1345 | 010287 |
| 5H3ZO | 14.092 | 1830 | 121486 |
| 5N0GAA | 14.086 | 1800 | 120586 |
| 7J1AEE | 14.101 | 2300 | 123186 |
| 9H4C | 14.087 | 1600 | 010387 |
| 9Q5HT | 14.077 | 1835 | 120586 |
| 9Q5FF | 14.092 | 1750 | 010387 |
| 9Q5NW | 14.082 | 1900 | 010387 |
| 9X5SP | 14.082 | 2110 | 010187 |
| CT3BX | 14.086 | 1430 | 010187 |
| D44BC | 14.082 | 2000 | 122186 |
| DF9FA/4S7 | 14.084 | 1430 | 121986 |
| FR4DL | 14.097 | 1730 | 121286 |
| HI8HFO | 14.089 | 2255 | 120286 |
| IS0AWP | 14.091 | 1420 | 123086 |
| JW5E | 14.095 | 1820 | 120886 |
| KC2OU/VP2A | 14.095 | 1530 | 010287 |
| KP2N | 14.085 | 1315 | 010187 |
| OD5PL | 14.084 | 1500 | 121486 |
| OX3FG | 14.093 | 1750 | 121386 |
| V31AB | 14.085 | 1420 | 121286 |

The following stations were worked via AMTOR by Tom, VE7VP.Frequencies used were around 14.075.

EA2YM, EI3DY, F6AXV, GI4WRI, HB9BJJ JA1BFK, OE1ACB, PA1DAF, ST2SA, T3OAT,TG9VT, VK5SG, Z25JS, ZS6AKO, 5H3ZO,9K2EC, and 9O5HT

(HITS & MISES cont. from pg. 2)

The Dayton Hamvention is just around the corner and I hope you have made your plans to be there. I'll be there and will be hosting the RTTY forum this year. So if you are going to be there I would like very much to meet you and talk with you. I'll have all the details of the forum in the next issue of the Journal. I think we have an exciting program lined up for you. Also, the highlight of the week for all us into the digital modes is the RTTY dinner held on Saturday night. If you are going to be there at the Hamvention, you won't want to miss this dinner. Get your resevation in early on this one. See the MSO column for all the details. Last year we were treated to a taste of good 'ole' aligator meat. Who knows what will take place this year at the dinner. Don't miss out!!

So here we go with 1987. I hope all of you have a great year and that happiness and good fortune abounds with you and yours. de Dale, W6IWO.

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**ED**: *This article is being published in a series which outlines one method of approach to the handling of a disaster situation. The equipment used in this approach could well be substituted by many other brand names on the market today. The author (Robert Hoover) has spent a great deal of time in preparing this article and the Journal is privileged to publish it in its' entirety. It will take several months to complete the article due to its length and complexity. Since the digital modes have been proven to be the fastest and in most cases the most reliable means of communicating during disaster or crisis situations it behoves us to exploit this superiority. Our thanks to Robert Hoover, KA6HZF for this fine contribution to a very worthwhile subject. The Journal invites other articles on this subject*

## The Commodore C-64/AEA PK-64 in Emergency Communications

Robert S. Hoover, KA6HZF
1875 Monte Vista Drive
Vista, CA. 92084

Modern disaster managemnet requires the cooperative efforts of many diverse agencies; large volumes of information are needed to drive the decision making processes. Critical analysis of recent disasters reveals a need for better short-range communication within the disaster zone --- particularly digital communication links --- in order to provide that information.

Digital communication is the norm in the real world; it is not surprising to find this mode in common use by the governmental units upon which we depend to provide assistance following a disaster. And while digital modes are the norm, most agencies accept the realities of disasters and have provided a means of interfacing non-digital inputs to their decision making machinery. Such interfaces are typically a clerk at a keyboard; they represent considerable expense and have a long training curve. Due to budget constraints each agency maintains only a minimum capacity, hoping to 'staff-up' after a disaster occurs. As you might suspect, during the first critical hours following a large scale disaster such interfaces are quickly overloaded. Information is delayed or lost as it piles up on both sides of the interface.

As early as 1980 the California Office of Emergency Services urged amateur radio to "..aggressively pursue..." the use of high speed digital communication for emergency service. The failure of ham radio to quickly respond has several causes; in many cases hams felt digital meant RTTY, and 'high speed' meant 100 wpm, and since such modes were already fairly common, no additional 'pursuit' was justified. In other cases, hams familiar with digital techniques were hampered by the lack of suitable equipment; disasters call for a high degree of both modularity and portability, features lacking in most amateur digital installations at that time.

With the advent of packet and packet-like techniques, particularly through the efforts of the Tucson Amateur Packet Radio Society (TAPR), amateur radio finally achieved a high speed digital protocol that would appear to satisfy the requirements of modern disaster management communication. But there was a gap between practicality and reality. Simply owning a Bug does not qualify you to participate in a high-speed CW net, any more than having access to high-speed digital communications devices insures creation of high speed digital networks.

For the digital novice it should be explained that a protocol is simply the name to a previously agreed way of doing things. In CW I might send "K6HAV de KA6HZF"; the use of the address first and my call sign last, separated by de ("here is....".Fr.), is part of the protocol for CW communications.

A human can easily handle complex protocols but not very rapidly. For the purpose of digital communications, the protocol is necessarily very complex.. and must be handled almost instantaneously, hence the need for some form of high-speed 'intelligence' in the system. TAPR neatly solved this problem by the use of a microprocessor on board their Terminal Node Controller, the name used to describe their digital interface. The TAPR TNC contains the standardized packet protocol; the microprocessor executes it at high speed.

### The Need for Standardized Software

As originally conceived, the TAPR TNC was nothing more than an intelligent interface between a radio and a terminal device, dedicated to the execution of a particular protocol. This provided for standardized communications between the radios but left the details of the human interface (ie, the terminal) up to the individual user.

Effective application of the TAPR TNC required a fairly high level of computer literacy on the part of the user; different terminal devices required different terminal software. The delightfully flexible system allowed the use of virtually any terminal device; one station might have the capacity to

(cont. pg. 12)

(Emerg. Comm. cont. from pg. 11)
handle large volumes of traffic while another might have only a keyboard. Hams with different equipment configurations could communicate as a result of the standardized packet protocol, but there was no standardization for the handling of data, neither for inputting to, nor outputting from, the digitalized communication system.

### THE QUESTION OF PRACTICALITY

While packet does operate at high speeds, its actual through-put is a function of several factors including input data rate and signal path. If data is entered at a keyboard-rate, and is relayed through several intermediate stations, the actual message handling capacity is often less than for a slow-speed Morse Code circuit. One of the truisms of life is that it is not the fastest runner who wins the race, but the one who finishes first. Packet is presently our fastest runner, but has yet to win many races. Packet is the best method for short-range, high speed communication, but until recently it lacked the practical features necessary to make it useful in emergency service.

### THE PROBLEM OF DATA ENTRY

Before it may be used, data must first be 'captured', either by some method of analog-to-digital conversion, or when dealing with the typical message, keyboard from written or verbal sources. This puts a sharp constraint on through-put unless provision is made to spool the output of a number of data-capture stations and direct them to a single high speed transmitting station. After a recent flood in Sacramento, California, (1986) packet was used to up-load Disaster Welfare Information (DWI) data to a local computer bulletin board, at a through-put rate of approximately 30 words per minute. The procedure was declared a great success but the obvious disparity was never addressed.

### THE PROBLEM OF POWER

Digital communications systems for emergency service must operate from 12vdc; it is the only true international voltage standard. This puts a severe constraint on the use of packet since most systems require the support of computers, few of which are 12vdc compatible. Tiny battery operated portable computers have been pressed into service but they lack full size keyboards and the necessary mass data storage needed for real-world disaster management.

**(Watch for continuation of this article in a future issue of the RTTY Journal.)**

## 16TH GARTG RTTY CONTEST

The German Amateur Radio Teleprinter Group (GARTG) announces their 16th GARTG SHORT CONTEST and welcomes participants of all RTTY amateurs in and outside the Federal Republic of Germany.

There are actually two contests (HF &VHF). Both contests will be scored separately. Each contest is split into 4 single contests within a year and the classifications are as follows:

**HF:**
1st part --- Sat. Feb. 14 1987 1300-1700 UTC
2nd part -- Sun. Apr. 12 1987 0700-1100 UTC
3rd part --- Sun. Aug. 30 1987 0700-1100 UTC
4th part --- Sat. Oct. 31 1987 1300-1700 UTC

**VHF:**
1st part --- Sun. Feb. 15 1987 0800-1200 UTC
2nd part -- Sat. Apr. 11 1987 1200-1600 UTC
3rd part -- Sat. Aug. 29 1987 1200-1600 UTC
4th part -- Sun. Nov. 01 1987 0800-1200 UTC

**BANDS:**
HF ---------- 80 and 40 Meters
VHF-------- 2 Meters and 70/23 Centimeters

**CONTEST CALL:**
CQ GARTG contest. After each QSO the station having called last keeps the frequency. All others should QSY.

**EXCHANGE:**
HF ----- RST, QSO- number, Name, QTH
VHF. --- Same as HF in addition QTH locator

**SCORING:**
HF: Each station may be worked once per band. Each completed QSO counts as 1 point on 80 and 40 meters.
VHF: Each completed QSO on 2 meters = 1 point, on 70 cm = 2 points, on 23 cm = 3 points per kilometer worked. Contacts via repeaters are not valid.
FINAL SCORE: Total of all QSO points

**CLASSIFICATIONS:**
Class A: Stations with more than 200 W. input
Class B: Stations with up to 200 W. input
Class C: SWL stations
Class D: VHF stations

**LOGS:**
To contain: a) Call, name, and complete address; b) Classification; c) Time in UTC, Call, Name, QTH station worked, transmitted and received message numbers, band used; d) Final score ( logs without final score will count as checklogs only)
VHF --- a) to d) same as above, e) QTH locator sent and received. (GARTG cont. pg. 13)

**SWL** ---- For points and scoring confirm above. The same stations may be reported only twice. Instead of message received, the SWL should report the station worked.

**RESULTS:**
Results will be published in the GARTG Newsbulletin, RTTY Journal, and the German club magazine, plus others.

**LOGS:**
To be received no later than 20 days after close of each contest. Direct logs to: *Wolfgang Punjer, DL8VX, PO BOX 90 11 30, D-2100 Manager, Hamburgh 90, Republic of Germany.*

## 8TH WORLDWIDE GARTG SSTV CONTEST

Those wishing information about this contest may send a SASE to the Journal or write direct to Wolfgang at the address listed above. This contest starts in April 1987.

| XYL | FRANCIS |
|---|---|
| Marcelle | OD5PL |

(See story in RTTY DX col. pg. 14)

## CLASSIFIED ADS

30 words $3.00, additional words 5 cents each. Cash with copy. Deadline for copy is 1st of month of publication

HAL COMMUNICATIONS ANNOUNCES THE NEW DS-3200 "RADIO DATA COMMUNICATIONS TERMINAL", RTTY, CW, ASCII, plus IBM "PC-XT" Compatability! Four models to choose from, including mass storage to 20 megabytes! For information and pricing call or write to Dick, K0VKH, Dialta Amateur Radio Supply, 212 48th St., Rapid City, SD. 57701, phone (605) 343-6127

FOR SALE: New GLB TNC2-A, used about ten hours, factory tuned and tested, complete with all books and instructions. $125.00 includes UPS in USA. Gordon Weiler, KI4WV , 8131 Calabria Ct., Orlando, FL. 32819

FOR SALE: Deluxe HAL system, MPT 3100 terminal, DSK 3100 disk storage, ST-6000 demodulator, ARQ 1000 terminal. Mint with cables and manuals. ONLY $2500.00. Jim Denneny, K7EG, (805) 251-7474

NEWS - NEWS - NEWS - Amateur Radio's Newpaper "WORLDRADIO" One year subscription is $11.00. Contact, WORLDRADIO, P. O. BOX 271309, Escondido,CA. 92027-0770

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

FOR SALE: HAL DS-3100 and ST-6000 like new with manuals, $995.00 plus shipping. These are in excellent condition and I will give a 15 day money back guarantee. Call Elmer Shafer, N8ES (216) 831-9198

HAM RADIO magazine: The no nonsense "state of the art" technical magazine. Subscribe now and see for yourself. one year $22.95 USA, $31.00 Canada and Foreign surface. $37.00 AIR, Europe, Africa, Japan areas. Contact: HAM Publishing Group, Greenville,NH. 03048

FOR SALE: INFO-TECH model ASR-500 converter with Sanyo 13" monitor and keyboard (CW, RTTY, ASCII). Used very little, $400.00 OBO. Don McKenzie, WA4ZRX, 5860 46th Ave., N. St. Peterburg, FL. 33709 - (813) 544-2629

FOR SALE: COCO Computer, 32K memory, with Kantronics Hamsoft for this unit. $100.00 plus shipping. Contact: Dale, W6IWO, 9085 La Casita Ave. Fountain Valley, CA. 92708 (714) 847-5058

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

## DX - NEWS

Happy New Year to you out there in the RTTY DX world. Hope it is a good one for all of us. Maybe we will start climbing out of the sunspot doldrums. As I mentioned last month, it looks like Santa brought a great deal of new RTTY/Packet gear, as I hear many new calls on the bands. Or should I say, band, as 20 meters is about all that has been any good lately. Hardly ever these past two months have I heard a signal on 15 meters. Well a New Year and better DX days are coming.

### RTTY DX NEWS

I do have some good info to share with you. First of all, Tom, VE7VP dropped me a note commenting on my lack of AMTOR DX news in the column and sent along some info. You are right Tom, I do need more AMTOR info so please continue sending it in. Tom's report listed many stations and I have included this info in the RTTY BANDPASS.

Peter Island ... As you may know the short stop over at Peter by KD7P did not take place. However, the NCDXF is providing major funding for a Norwegian expedition to take place starting around February 20th and lasting for two weeks. All bands, all modes!! are said to be used. Lets hope that means the Digital Modes also.

Russia UD or UG ... UA3TT says he and others are making plans to put either UD, Azerbaijin or UG, Armenia on the air on RTTY sometime early in 1987 and will keep us posted. This is the same group that put on the recent UF Georgia RTTY DXpedition.

Svalabrd JW5E ... continues to be active 1700 - 1900 UTC. This is a club station, new to RTTY, QSL cards go to LA5NM.

4S7 Sri Lanka ... DF9FA/4S7 continues to be active around 1300-1400 UTC as well as other times. In addition, I received a letter from Scott KN1I, Scott says he has received a letter from 4S7WP, Shanti, who says he has a Commodore 64 but no TU and NO software, but if he could get some help in getting same, he would be glad to be active on RTTY. Any help or suggestions?? If so, drop me a line or write direct to Shanti, via W.P.S. Perera, 11 A Wijaya Road, Kolonnawa Wellampitiya, Sri Lanka.

Rwanda 9X5SP ... Peter has been active off and on but always around 14.082 between 2000 and 2200 hrs UTC. QSL info to P.O. BOX 111, Kigali, Republic of Rwanda.

Zaire ... 9Q5NW and 9Q5FF were both up on 2 and 3 January with good signals here on the east coast. 9Q5NW QSL cards go to AL7EF, P.O. Box 368, Stockbridge, GA. 30218. 9Q5FF cards go to WA9PCI.

Madeira Islands ... CT3BX has been very active around 1330 - 1500 UTC especially on weekends. QSL to CT3EE, P.O. Box 4055, Funchal 9000, Madeira.

China BY1PK ... has been seen around 2300 UTC on 14.090 running 400 hz shift. QSL to P.O. Box 2654, Beijing.

Egypt SU1ER ... has a sked (reported) every Friday at 1300 UTC on or about 14.095.

Easter Island 3GOC ... QSL's for this go to CE3CEW, P.O. Box 76, Santiago, Chile, S.A. Please remember to include SAE and appropriate amount of IRC's or return postage.

Gibralatar ... ZB40ANV (celebrating the 40th anniversary of Amateur Radio on the ROCK), was active for one day during the week of December 15. If you worked this station, QSL to: Gibralatar Radio society, P.O. Box 292, Gibralatar.

Oman ... if you worked A4XZF, Rod, send your card to G0ASE. Rod has gone QRT now but another station has appeared signing A4XKB. He also likes AMTOR.

Sudan ... ST2SA continues to be active on AMTOR as well as packet.

Tanzania ... 5H3ZO has been reported active on AMTOR also.

Minami Torishima ... In addition to Rick, 7J1ACH, I also saw 7J1AEE on Packet on 10 December (freq. 14.101) in QSO with a W5 at 1315 UTC.

Kiribati ... T3OAT Alan is packing up and heading for VK6 land. If you need a card, QSL NOW to G4GED as he will stop answering when he runs out of the present supply.

RTTY DX (cont. from pg. 14 )

WA4WIP ... Dick Tesar, also known as the 'Wipper' to many of us, is trying to start a fund to equip some of the rarer countries with RTTY gear. His first targets will be J88 St. Vincent and J6 St. Lucia and from then on will select others as funds and interest dictates. If you are interested in helping out contact Dick at his CBA. Dick has already sent a letter out to many of the state side guys he hears chasing DX on the RTTY bands. Sounds like a great idea!!

Other DX Tidbits ... WA4WIP and KP2N are planning on a Springtime DXpedition to J73 Dominica and V44 St. Christopher and Nevis.

TG9VT ... says in a recent conversation with Jim Smith, VK9NS, that he is planning a trip the end of January to COCOS KEELING with a stop at Christmas Is. The trip will last ten days.

WA4WIP ... mentions that WB2TSL is going to V4 land on vacation and will visit the QTH of V44KT and bring back the logs. This will answer some of the QSL's he has on file.

3G0SBY ... should be active now
KL7LK/KH3 ... active sometime in February
VE7VV/KC6 ... should be active

Lebanon ... CD5PL, Francis sent me a very nice letter and photo which I will share with you this month. He has not been active since late November, but plans to be more active this year. QSL cards for Francis, go to HB9CRV.

**RTTY DXER OF THE MONTH**
**OD5PL, FRANCIS ZOUIEN**

Francis's letter to Roy follows:

*Thank you Roy for sending me the RTTY frequency book, it is a great help. Let me give you a resume of my life.*

*I was born 29 January 1942. I am English and French educated and speak fluent English, Arabic, French, and Italian. I am married and my wifes name is Marcelle, and we have three boys, Nicholas 17, David 13, and Marc 7.*

*In 1962 I joined the US Military Training Mission in Saudi Arabia at Dhahran Airport in the communcations field. I then shifted to the WESTREX Company in the same line of work at the Airport until 1973.*

*I then started a construction company with a good friend of mine and we became a good size local company with over 300 employees with many nationalities. In 1982 we decided to go home to Lebanon. We took 3 months vacation traveling to Europe, Africa and the Far East. After our return I opened a Jewelry Store here in Hazmieh, 12 miles east of Beirut. The Jewelry business is the profession of my family, my grandfather, father and two brothers, Georges and Josef, all are Jewelers.*

*In the beginning, I had a lot of trouble as I knew nothing about the Jewelry business, but with the help of my brothers I became good and now the business is fantastic. You might be surprised starting in communication then construction and ending with jewelry, but that is the way it goes hi hi hi.*

*You might ask what are we doing here in this part of the world especially during this crazy war? Well the answer is, the solution is out of our hands! It is an International game played in our land, there is nothing we can do except pray to God to help us and save us and cover our beautiful country with PEACE again. There is nothing we need but PEACE!!*

*I hope one day to visit the United States and I am making plans now. I hope to do so soon.*

*My working conditions here are: Collins TX/RX 100 watts, 3 element Yagi and for RTTY a HAL CT-2100 and KB-2100.*

*Please, my best regards to you and to all my RTTY friends, Good Luck and God Bless.*

*Your friend, Francis*

Well, thank you Francis and we all hope PEACE comes to your part of the world as well as all over the world in 1987. (ED:Picture of Francis and his wife in this issue)

Well my fellow DXers, that is about it for this month, hope some of the info is helpful to you. Please share your info with me and our fellow readers by dropping me a line when you have the time. Thanks and a tip of the hat to: OD5PL, W1DA, TG9VT, VK2AGE, VE7VP, W0LHS, WA4WIP, and the DX Bulletin. de Roy, KT1N

**(Packet cont. from pg 7 )**

3. During "rush hours" keep your connect to a system as short as possible as others may want to check it for messages listed for them. Using some common sense and courtesy gives everyone on the local network a chance at better communications via Packet.

Until next month ... good luck, get connected and happy Packeting!!! 73 de Danny, N6IHQ

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