RTTY

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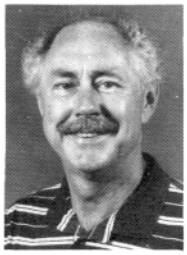

HITS & MISSES

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My Contesting Opinion

I have been thinking about why more 6-land Hams don't compete in the Digital Contests. I have not run a survey of any kind to find out how many compete in CW or SSB contests, so there is no basis for any kind of a statistical argument here. But, over the years I have competed in a number of RTTY contests and at times have become disenchanted with how things were working out for me.

You see, being here on the West coast has it's disadvantages. When the band is open to Europe I notice that the Europeans and the East coast go at it hot and heavy. I try from the West coast to break through the East coast wall but, it only becomes a futile effort. I call those European stations for hours and end up with no results because they will just not come back to me. That leaves only one alternative. Wait until the East coast is exhausted and try again. In other words, go back to bed and sleep for a few more hours.

However, in defense of Hal, WA7EGA, Jay, WS7I, Richard, N6GG, and a few others, the West coast does not make much of a showing in RTTY contests. My agrument is the East coast wall. You might argue that we on the West coast have the West wall when it comes to the Pacific Rim stations. That may be so, however, they are small in numbers compared to the European theatre of action.

Because of all this, I feel disadvantaged. Why, not set up a contest with a Head-Start feature. Suppose the West coast was allowed to start at a different time that the East coast. Then we West Coast folks could work Europe during this period of time without the East Coast Wall interference. Once this Head-Start time period expired, then it would be free for all. In all fairness here, when the Far East opens up then the West coast would have a dormant period so that the East coast folks could work without the Wall interference.

Here's another argument. At present there are only two RTTY contests (VOLTA and ANARTS) that use the Exchange Points Table (see April 93, page 20) for scoring. This method has not been exploited by any of the other contest groups but I think it has great potential for making RTTY contests more equitable. Here are a two examples:

Example I

Zone 3 works Zone 25 - Exchange Points Table says 24 points

Zone 4 works Zone 25 - Exchange Points Table says 30 points

Zone 5 works Zone 25 - Exchange Pints Table says 31 points

Example II

Zone 3 works Zone 14 - Exchange Points Table says 26 points

Zone 4 works Zone 14 - Exchange Points table says 19 points

Zone 5 works Zone 14 - Exchange Points table Says 18 points

In the first example the spread is 7 points different and in the second example, the spread is 8 points. I think these two examples clarify what I mean about being equitable. However, I still feel because of the sheer numbers of European stations available to the number of Far East stations available makes for a good argument in favor of a Head-Start type of contest.

If you look at the records, you will also notice that some West coast Hams have traveled to other Zones in order to gain an advantage in the number of points awarded for a QSO.

I have been wanting to air this argument for about 20 years but kept putting it off until now. You may not agree with me but I think RTTY contesting could attract another few hundred Hams if the contests were more equitable. I also believe we are caught up in a standard format for Digital contests. In fact, in this issue you will find one new Digital contest introduced. It is sponsored by the Italians. Again, this contest follows the same standard format that most Digital contests use. You may argue that the two contests now using the Exchange Points Table do not enjoy much participation, That is true, but, let's look at the contest periods. The VOLTA contest usually falls on the Memorial day weekend which is a national holiday in the US. Consequently, most Hams have other plans for that weekend, especially if the weather is good. The ANARTS contest falls in August which is the worst time of the year for propagation. I believe both of these fine contests are at a disadvantage in attracting participants for the above reasons. I'd like to see one of the major contests change over to the Exchange Points Table and see what happens.

Well, there I said my piece. I got it off my chest. I feel lot a better too! How do you feel about my suggestions for Digital contesting? I would be interested in hearing your comments.

DAYTON UPDATE

With the block of rooms now spoken for, those of us working together are proceeding with plans for an exciting Digital weekend. Please be advised if you are going to attend the RTTY dinner on Saturday night, you must send your money to Steve Waterman now. He needs to notify the hotel of how many are going to attend well in advance of that night. So, don't hesitate, send your check tomorrow. Details are on page 22 of this issue.

In the March issue I will publish the schedule of events that have been organized by Jay, WS7I and Jim, KE5HE. I hope to also publish the hotel map of where the new hospitality room is located. We have been moved to a larger room which is most appreciated.

SOMETHING IS ADDED

In this issue you will find two new columns. The first is entitled 911. It's purpose is to help you with Digital problems. We all have problems from time to time and when this happens occasionally, we cannot find a solution. That is where 911 can help. You submit your problem to 911 and ADRS will make every attempt to find you a solution. We could have also called this an "Elmer" column but 911 is more appropriate. When you need help, you want it right now, not later. So, give this 911 column a chance, send your problems to the ADRS.

Also, this month you will find the Opinion Column. (page 6) Bill Harper, KB4JKQ, expresses his opinion and we thank him for writing. In this column I have also expressed an opinion. All of us have an opinion from time to time. Why not share it with the Digital gang. Sit down today and write to the ADRS expressing your opinion. As long as it is related to the Digital arena, the ADRS will make every effort to publish your opinion.

That's it for this month. 73

de **Dale, W6IWO** ■

PACTOR

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As the winter rolls on pickins' are running a bit slim. Temperatures in the midwest have been well below zero and the solar cycle continues to decline. The mail has also slimmed, but let me thank... Bob, AA4PB; Tom, DL2FAK; Peter, DL6MAA; Jim, N2HOS; Ken, N4SO; and Joe, W3/G3ZCZ; for their contributions. PACTOR NEWS I shall attempt to include a short list of current PACTOR news topics each month, but I need help! This will only work if I get updates of the latest information. Please don't be bashful. If you have something to share with us, please send it to me.

- SCS is releasing the SCS Plus. A review sample is due here soon.
- Peter, DL6MAA, will be speaking in Dayton on the topic of PACTOR II.
- Bob, AA4PB; reports PakTerm is now up to revision 1.04.
- At last report DK0MHZ BBS still out of service (lightning)
- The dual port LAN-LINK is in the works, says Joe Kasser W3/G3ZCZ.
- The first PACTOR II units should be available at the Dayton Hamvention. Look to this column for the most up to date information in the field!

PACTOR BASICS

SETTING UP A PACTOR STATION

(COM PORTS/DATA SIGNALS)

Part One

This is the first of three parts concerning the assembly of a PACTOR station. In this part we discuss the basic elements of a PACTOR station and the hook-up of RS-232 data between a computer and a TNC. The second part will be about connecting a TNC to your rig and the third about PACTOR operation. To set up a PACTOR station you need three elements, a computer, a TNC (Pactor/Controller or MODEM), and an HF transciever with antenna. All three need to work together to provide the best performance.

The computer takes digital data (such as typing from the keyboard) and sends the data (primarily by RS-232 protocol) to the TNC or Controller. It also receives RS-232 data back from the TNC for display on the screen. The computer and TNC 'handshake' to properly control the flow of information in both directions. [Most computers link RS-232 data with a TNC. Some computer programs, such as BMK-MULTY, do part of the work of the TNC within the program. In these cases, the COM port of the computer is used to directly control a modem and wiring between the two does not conform to the standard configuration.]

The TNC (PACTOR Controller) receives the serial RS-232 data from the computer, converts it to PACTOR protocol and sends it to the Transciever to be transmitted. Likewise audio from the transciever is decoded by the TNC, translated to ASCII data and sent by RS-232 protocol back to the computer for display, storage, or printout. The TNC also controls the HF radio's PTT line to switch between receive and transmit and interfaces with the computer to properly transfer data back and forth.

The HF transciever transmits audio (either FSK or AFSK) to another PACTOR station and receives audio from the other station. This audio information is transferred to and from the TNC. The TNC provides supervision and control of the rig.

In short, the interface between the computer and the TNC is a bi-directional digital connection and the interface between the TNC and the rig is a bi- directional audio path.

To create a good working station all elements must work together. There are some considerations to be made when choosing elements that need to work in harmony. Let's discuss each in turn..

1. Computer: No matter the type of computer, it is going to have to 'talk' with the TNC. There are all types of control programs, but it is always best to use a program that was SPECIFICALLY designed to work with the TNC that you are going to use. It makes no difference if the program is from the manufacturer of your TNC or from somewhere else (such as public domain). The important consideration is that it will work properly. Another requirement is that the computer have sufficient speed and memory to work with the intended application. Although a 'dumb terminal' would work, you certainly would not have a lot of fun.

Finally, there needs to be a serial port available for use. Most people who use PC devices will utilize Com Port 1, it makes no difference. But it important to realize that in PC devices, COM 1 and COM 3 share a common interrupt. (ie, you can't use both at the same time) So another device, such as a serial mouse may cause difficulties. That's why I highly recommend that every ham with a PC and a mouse use a BUSS mouse.

2. TNC or PACTOR controller: The type of TNC you use is going to depend upon your needs and preferences. Some are designed solely for PACTOR while others incorporate PACTOR as another of many available modes. PACTOR has many implementations, some pretty good and others added as after thoughts. Once you have decided upon your TNC, one basic concept holds true. For the best performance, the computer software needs to properly match the TNC being utilized AND connections to the computer and to the rig must be done correctly.

3. HF Transciever: Most any modern HF rig will run PACTOR. There are some areas you should investigate before buying and installing PACTOR.

- Key up time - Most newer HF radios will key up in less than 20 to 25 ms. Older units with relays may take longer while new units may even be faster. PACTOR is a linked protocol, so as a result, an increase in the key up time will DECREASE the communications range.
- Duty Cycle - Older equipment can stand a higher duty cycle than newer HF equipment. In any case, remember that PACTOR is going to be putting more stress on the equipment that SSB. It's a good idea to take the load off of the HF equipment by reducing the duty cycle.
- Hum and distortion - Digital modes, like PACTOR, do NOT REQUIRE A LOT OF POWER. What they do require is a 'clean' signal without a lot of hum or distortion. During transmission your local microphone (AFSK mode) should be disabled or disconnected to avoid interference with the PACTOR audio. There should be little, if any, hum or noise being transmitted in the absence of a modulating signal. Power supply hum (50-60Hz) must be reduced or eliminated.
- Frequency stability - Most newer rigs will stay reasonably well on frequency. PACTOR does have some tol-

quency. PACTOR does have some tolerance. However, older units with manual VCOs have a tendency to drift. Unless you wnat to keep a hand on your VCO and repeatedly correct for drift during a QSO, it's a good idea to use a rig that will 'stay put' (+/- 10Hz or so)

HOOKING UP DATA COMMUNICATIONS

One of the great challenges is getting the computer to 'talk' to the TNC and getting the TNC to properly interface with the HF rig.

Most computers have a serial port, as do most TNCs. In order to hook the two properly together, we need to look at RS-232 protocol. Here's a quickoverview.

RS-232 is a protocol system of moving serial data, one bit at a time, between two points. It is a rather complex industry standard and involves data signals and 'traffic' control. Luckily, for our purposes, we need only be concerned ith nine wires:

- Frame Ground (FG) - attaches the chassis of the computer to the chassis of the TNC. Static ground. Sometimes connected in common with Signal Ground. This line always needs to be connected.
- Transmit Data (TXD) - a output of data from the computer to a data input port at the TNC or MODEM. This line always needs to be connected.
- Receive Data (RXD) - an input to the computer of data being sent from the TNC or MODEM. This line always needs to be connected.
- Request to Send (RTS) - a positive voltage output signal from the computer indicating the computer is ready to accept data from the TNC or MODEM. This is part of hardware flow control and only needs to be connected if hardware flow control is being used.
- Clear to Send (CTS) - a positive voltage output from the TNC or MODEM to a computer indicating the TNC or MODEM is ready to receive data. This is a part of hardware flow control and only needs to be connected if hardware flow control is being used.
- Data Set Ready (DSR) - a signal from the TNC or MODEM to the computer indicating the TNC or MODEM is operational. This is a positive voltage signal indicating the TNC or MODEM is being powered and is "pulled low" when power is removed from the TNC or MODEM. Connection is optional.
- Signal Ground (SG) - is the common or return path for all signals between the two devices. Sometimes this line is in common with the Frame Ground. This line always needs to be connected.
- Data Carrier Detect (DCD) - a positive voltage output from the TNC or MODEM to a computer indicating the presence of a data carrier (connection) to the MODEM from some outside source. Connection is optional.
- Data Terminal Ready (DTR) - a signal from the computer to the TNC or MODEM indicating the computer is operational. This is a positive voltage signal indicating the computer is being powered and is "pulled low" when power is removed from the computer. Connection is optional.

One confusing aspect of RS-232 is your prospective. Much like a ham radio, RS-232 transmits and receives data. Whether you are transmitting or receiving depends upon where you are. But in respect to the definitions, shown above, we are always looking at the computer side of the interface, called Data Terminal Equipment (DTE). At the other end where or TNC (or MODEM) resides, called Data Communications Equipment (DCE), the definitions stay the same, and the connectors are wired identically, but functionality is reversed. This stands logic on its head in the name of simplicity, and is why many hams get confused with computer interfacing. (see Table I)

As you can see, using a cable wired pin for pin (1 to 1, 2 to 2, etc) will do. For most devices with mutual 25 pin connectors only pins 1 through 8, 20 and 22 are needed. When wiring between 9 pin and 25 pin connectors standardized cables or adapters can be used. Generally 'off the shelf' computer cables will suffice. In order to cut down on RFI in the shack avoid flat ribbon cables in favor of round shielded ones.

Once the proper wiring is installed, we need to set the configuration. There are four areas of concern:

1. Baud rate - This is the speed at which data runs from one port to another. It is important that both ports are set at the same baud rate. This rate can either be set by software in the associated device or by DIP switch.

2. Number of Data Bits - With ASCII there are usually 7 or 8 data bits depending upon the port configuration. When using PACTOR 8 bits is the recommendation.

3. Parity - This is the form of error checking employed and there are five choices.. even, odd, mark, space, and none. Using parity usually requires a data bit be surrendered. So, seven data bits is generally matched with even parity and eight bits with no parity.

4. Flow control - At speed in excess of 2400 baud some type of flow control is necessary to avoid one port overloading or 'swamping' another. There are two types employed, software and hardware. With software flow control, certain data symbols (generally Control-S, ASC 019, HEX $13 to stop and Control-Q, ASC 017, HEX $11 to start) are used. When hardware flow control is used, RS-232 data lines CTS and RTS exchange busy port status conditions.

The important thing to remember is that both the computer and the TNC (or MODEM) need to have all these parameters set identically. For more details about RS-232 and COM ports, RTTY Journal publishes a compilation of articles.

Next month I will continue the subject of connecting a PACTOR TNC to your rig. Sorry for the delay, but there's only so much space.

Thanks for sharing your time with me this month. Until next time;

de **Phil, KB8LUJ** ■

May God Bless you and yours. Link d-o-w-n..

*** DISCONNECTED: KB8LUJ

Table I

Data terminal Equipment (DTE)			Data Communications Equipment (DCE)		
25 pin	9 pin		25 pin	9 pin	
Frame Ground (FG)	1	shell	1	shell	Frame Ground
Transmit Data (TXD)	2	3	2	3	TXD (Rx input)
Receive Data (RXD)	3	2	3	2	RXD (Tx output)
Request to Send (RTS)	4	7	4	7	RTS (Rx CTS)
Clear to Send (CTS)	5	8	5	8	CTS (Tx RTS)
Data Set Ready (DSR)	6	6	6	6	DSR (Tx DTR)
Signal Ground (SG)	7	5	7	5	Signal Ground
Data Carrier Detect (DCD)	8	1	8	1	DCD (Tx DCD)
Data Terminal Ready (DTR)	20	4	20	4	DTR (Rx DSR)
Ring Indicator (RI)	22	9	22	9	RI (usually nc)

OPINION

From those who chose to write

From:
William A. Harper, KB4JKQ
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Dear Dale,

A recent article in the RDJ has caused me to forward my observations to you. First, you can add me to the N6HM list of befuddled digital Hams. I will confess to being among the first to purchase the PK-232 and it was two years before I got on the air with it.

Now I don't claim to be all that smart, but I sure felt rather dumb for quite a while. I took my 830 and the PK-232 to my Elmer, and asked for help. This gentleman had been a ham over 50 years and held jobs for over 40 years as a broadcast engineer. I knew he could solve my problem, He did wire it up and I did get on the air but my contacts were very limited. Yes, I did call the WA number a few times and when I hung up the phone I was more bewildered then before.

Along about that time I read an article in either QST or CQ that told how the AEA people decided to test the PK-232. It stated that the AEA folks in all their wisdom had sent over 30 units to operating hams to test and report their findings. And guess what? Every one of them was an Extra Class ham with years of experience. They all reported some problems but the gear worked. Then they sold the PK-232 with the hand book to the less informed as written.

It was 2 or 3 years later before they put out a book the person could understand, and after many people raised much hell with them.

I suggested to them:

1. To hire a tech writer that would use a task analysis approach i.e. a step by step approach to achieve a stated objective to enable the end user to hook up his radio to the TNC and to operate it in the various digital modes. Then write how to do it step by step.

2. Send the 30 units to hams of Novice/General level and see if they could get the things running with the paper work supplied. Use the reports returned as a basis to rewrite the hand book.

3. This is a Behavior Development approach to tech writing and curriculum development used by the US Navy. It was developed by the Research Center in Point Loma, CA.

4. I must say I am very happy with my PK-232 and all the updates. They are getting better as time goes by. But they did have a sorry start based on my limited experience.

73,

de **Bill, KB4JKQ**

HAPPY FACES

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Dear Dale,

I have been operating PacTOR for about two months now and I have not seen any "Smiley's" in ham text. I thought other operators might enjoy seeing these "Smiley" faces copied from the Internet Email culture. Please exchange them with good humor and a gentle attitude.

For those not familiar with the Internet, it is an international electronic network of University and Research institutions that is just now becoming a hot public topic (see recent articles about the new "Information Highway" in Newsweek, USA Today...). Millions of electronic "email" messages are exchanged each day among hundreds of thousands of people all over the world. Access to the Internet is now public and you will be hearing a lot more about it. (Email uses 7 bit ASCII as its standard for information exchange. This permits binary file exchanges using the international UUENCODE scheme - the topic for a future article).

Since it is not easy to convey tone of voice in an email message, Internet users have invented various visual clues as to the emotional content of their messages. To view these hidden message, you simply turn your head sideways. One of the most common faces is the smiley face :-) There is a new book from the O'Reilly group that has hundreds of Smiley faces.

Smiley faces from Internet electronic mail:

:-)	ha ha
-)	he he
|-D	ho ho
:->	hey hey
:-I	hummmm
:-o	uh oh
|-P	yuck yuck
:-(	boo hoo
:-O	orator
(:-)	big smiley
:-t	cross smiley
:-p	tongue out
:-x	lips sealed
:-?	questioning
(:I	egghead
<:->	mad
:-@	screaming
:-D	laughter
:-#|	bushy mustache
:-6	after eating something sour
:-7	wry statement
8-)	with glasses
:-&	tongue tied
(:-(	frowning
:-e	disappointed
:-i	semi-smiley
:-\	undecided
:-c	bummed out
<:I	dunce
;-)	wink
E-:-I	ham radio op (yagi)

73

de **Ken, N9VV E**

DX NEWS

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As of the end of January, we are anxiously awaiting the publication by the DX Century Club (DXCC) of the initial listing of the RTTY Honor Roll. After the first of January 1994, in order to reach this significant milestone, you must have received, and submitted to the DXCC desk at ARRL, and have accepted, confirmed digital contacts with 319 DXCC countries. (You would have made it if you had 318 accepted prior to 1 January.) These contacts can be in any non-CW digital protocol, such as Baudot, ASCII, AMTOR, etc. Perhaps by the time you read this, the listing will have been published in the new ARRL DXCC Yearbook, which was promised to be distributed in early February.

Elsewhere in this issue, you will find information by Jay, WS7I, regarding a new ADRS initiative to be instituted at the 1994 Dayton Hamvention. Among the one hour sessions, to be held on the afternoon of Friday, 28 April, at the Radisson, will be one devoted to RTTY DXing. I have agreed to chair this particular session. It is my hope to bring together as many RTTY DXers as possible, to share stories of unusual experiences, swap lies and legends, exchange ideas on operating techniques such as cracking pileups, exchange tips on bringing up reluctant software, and otherwise getting to know each other better, face to face. .

The format is planned to be flexible. It is my hope that we can make this session somewhat unique. If a slide show travelogue, showing airport departure signs, and aerial views of approaching Podunk Island, snapshots of natives in colorful garb, and brief snatches of keyboard operation, is your cup of tea, then you probably won't be too thrilled at participating in this event. On the other hand, if you would like to exchange nitty-gritty details of effective RTTY DXing, by both sides of the QSO, then by all means, mark the date and time on your calendar.

In the meantime, I welcome your suggestions as how most effectively to meet the above mentioned objectives in the time that will be made available to us. Please let me know your thoughts on the subject.

"Propagation Blues" is a prevalent subject of conversation these days, both on the air and in print. Bob Brown, NM7M, in his popular Worldradio Propagation column, reminds us, in the February 1994 issue, that NOAA's prediction for the low point in this cycle is a smoothed minimum sunspot number of 6 around 1996. Looking to the estimated peak of Cycle 23 around the year 2000, an estimated high sunspot number of a measly 108 is predicted! To keep your courage up, Bill suggests the following: "...get what you can out of the bands right now while there is still some vestige of real solar activity. As that declines, then give up trying to work through higher latitudes; critical frequencies up there will drop like a rock before you know it. Instead, try to concentrate on the lower latitudes as transequatorial propagation holds up no matter what. And if you're inclined to go on DXpeditions, then try the equatorial latitudes; the heat may be miserable, but the equatorial ionosphere is the last to go." Coming from my favorite writer on the subject of propagation, this sounds like advice we could well follow.

DX DOINGS

BANGLADESH, S2 - When conditions permit, you may find S21A on 20 meters around 1300Z. QSL via W4FRU.

BELIZE, V3 - The trip by WN0B and AA0KL has been cancelled for this year. Look for them in March '95.

BENIN, TY - Look for Ken, TY8OBO to reappear here for a brief appearance during March. QSL to WA4OBO.

BOLIVIA, CP - Roque, CP6RP likes 15 meters around 1500-1930Z. QSL to I0WDX.

BOTSWANA, A2 - It is good to see that Dave, A22MN, has not forgotten the RTTY mode. He may be found on 10 or 15 meters, depending on propagation, after 1800Z. QSL to Dave Heil, P.O. Box 90, Gaborone, Botswana.

CEUTA & MELILLA, EA9 - In addition to EA9UN, EA9DX often shows on 20 meters around 1330Z. QSL route is needed.

CHAGOS, VQ9 - VQ9TS, VQ9LD, or VQ9WL may be found on 15 or 20 meters between 1300 and 1700Z. QSL routes are needed.

DODECANESE, SV5 - SV5AZP operates on 20 meters around 1400Z. QSL route is needed.

DJIBOUTI, J8 - J88BS may be found around 15 meters around 1430Z. QSL via WA4WIP.

EGYPT, SU - In addition to appearing from time to time on 40 meters, SU1AH shows on 20 meters around 1700Z. For QSL route, see RDJ for January 1994.

ETHIOPIA, ET - Dragen, ET3YU has been favoring other modes recently, but can sometimes be found on 15 meter RTTY around 1400Z. QSL to Box 60349, Addis Ababa.

GEORGIA, 4L - 4L8A continues to make this country available on 15 meters generally, between 1030 and 1400z. QSL to OZ1HPS.

KAZAKHSTAN, UN,UQ - UN5PR and UQ9TV are often found on 15 meters between 0900 and 1300z. QSL routes needed.

LEBANON, OD - OD5PL has been active on 15 meters from 1200-1400Z. QSL to HB9CRV.

LESOTHO, 7P - Ray, 7P8SR still gives this one out to the deserving, mostly on 20 meters after 2100Z. Prior to that he may be on 15 meters, starting around 1715Z, until the band folds. For a sure card, QSL direct to Ray Shankweiler, P.O. Box 333, Maseru 100, Lesotho.

MADAGASCAR, 5R - 5R8DS can most often be found on 15 meters after 1800z, but occaisionally he shows as early as 1330Z. QSL to F6FNU. 5R8LD can also be found around these same times. QSL route is needed.

MALI, TZ - TZ6FIC has been active on 15 and 20 meters. Look for him on 15 meters between 1330 and 1630Z, and on 20 meters after 1800Z. QSL via FF6KEQ/F6KEQ. TZ6QC is another call reported from Mali. QSL route is needed.

MOLDOVA, ER - ER1PE has been reported operating reverse tones on 15 meters around 1355Z. QSL route is needed.

MOROCCO, CN - Frank, CN8NP continues to be active from Rabat. He likes 20 meters best after 2030Z. QSL to Frank Patris, c/o AMEMB Rabat, PSC 74, Box 024, APO AE 09718.

MOUNT ATHOS, SV/A - Luciano, I5FLN reports receiving a QSL card confirming his RTTY contact of last fall with SV2ASP/A. We anxiously await the reported rebirth of Monk Apollo's station, which was promised for this spring.

NAMIBIA, V5 - A welcome newcomer is Chad, V50CM, who has been burning up the bands since his arrival on RTTY during late December. He likes 10 meters after 1145Z, 15 meters after 1530Z, and 20 meters after 2030z. QSL to P.O. Box 1500, Tsumeb, Namibia.

NORTHERN CYPRUS, 1B(?) - 1B1AD has been copied on Pactor from this non-DXCC country(?) on 14079 at 1436Z. This

entity has no DXCC status, nor is it likely to have in the near future. The applicant for DXCC country status recently requested that his petition be put on hold, pending some possible political settlement. When that hold is released, and additional requested information has been received, the DXAC will schedule a vote on the subject. The 1B prefix is self assigned by locals, and has no official standing with the ITU. If you like wallpaper, send your QSL card to DK7ZZ.

PETER I Is, 3Y - This widely heralded, record cost, DX'pedition is now history. As you read this, the team members should be in transit, on the way back to their home countries. I will have some comments about the operation next month.

In the meantime, if you have not yet made a contribution, send it along with your QSLs to Gerry Branson, AA6BB, at 93787 Dorsey Lane, Junction City, OR 97448.

PRATAS Is - BV9P - Although not on the accredited DXCC countries list, Pratas Island has been the subject of much conjecture in recent months. At the beginning of January, Martti, OH2BH/VR2BH disseminated an informative bulletin world-wide on this subject.

Here are some excerpts.

"Pratas Island (300 by 500 meters in size) has been under Republic of China (ROC) control throughout the existance of BV-land, or some 40 years. The island is subject to permanent ROC military presence. Pratas is not accessible by civilians or non-Taiwanese citizens. The island is located 116.43E and 20.42N, being separated by more than 225 statute miles of open water from Taiwan."

Referring to the four hour, closely supervised 630 QSO operation that occurred on 5 January 1994, Martti further stated "The aim of this operation (was) to introduce amateur radio and its benefits to the ROC and the Pratas Island administration as well as to prepare and explore the ground for a major operation now tentatively scheduled for March 1994."

He concluded "Amateur radio on Taiwan is relatively young and it remains in the hands of newly licensed operators who have undertaken major measures to introduce amateur radio on a greater scale into Taiwan. The League President, Dr. Bolon Lin, BV5AF, and League Secretary Dr. Tony Liu, BV4OB have now succeeded with another important undertaking for the benefit of amateur radio, promoting Pratas Island and the DXCC program plus the DX end of amateur radio in their community. We kindly ask all amateur operators worldwide to show maximum cooperation and patience in the course of Pratas Island activation over the next several months. Let us all wish them well - those brave members of the DX community who are ready to face this kind of an adventure in providing the DX fraternity with moments of great enjoyment in their radio shacks."

Martti's outlook, as always, seems particularly upbeat. If all progresses satisfactorily, I hope we will soon see RTTY from this heavily guarded South China Sea outpost.

Bill, NA2M, Hudson Division representative on the DXAC, reports in the January 1994 issue of the NJDXA Newsletter, that a petition has been received from BV4VB to consider addition of Pratas Island to the DXCC Countries List. The DXAC has requested additional information from the petitioner, and will schedule a vote on the subject after this information is received, and appropriate discussions have taken place.

SAO TOME & PRINCIPE, S9 - S92ZM has recently appeared on 20 meters as late as the 2015-2150Z time slot. For QSL route see the RDJ January 1994 issue, p 14.

SRI LAMKA, 4S - 4S7RM has been reported on 20 meters at 1650Z but I am still chasing that prefix. QSL route is needed.

ST. HELENA, ZD7 - Active stations include ZD7AY, ZD7SM and ZD7DP. They can be often found on 15 meters around 1700Z. QSL ZD7DP to Box 86, St. Helena, South Atlantic Ocean.

SOUTH COOK Is, ZK1 - Gordon, ZK1AVK/AA7VY, and/or Gary, ZK1AIQ/KD3IQ will run RTTY from Raratonga (OC-013) 4-10 March. They will then move to the island of Aitutaki (OC-083) and operate until 17 March. For QSL routes, and details of other mode operations by the distaff side, see RDJ January 1994, p.14.

TADZHIKISTAN - EY - Look for EY8CQ on 20 meters between 1130 and 1200Z. QSL route is needed.

UKRAINE, UR, US, UT, UX - There is plenty of activity out of Ukraine these days with the likes of UR5LBX, US5TCP, US8AR, US0HZ, US0LA, UT5RP, UT2UZ, UX0KC, UX0LT, and UX0KN. They generally show on 15 meters between 1000 and 1250z, and on 20 meters thereafter until the band dies.

WALVIS BAY, ZS9 - You may still have a chance to add this one to your country count, before the expected imminent deletion from the DXCC country list, when it is to be returned to Namibia. Ian may be found working his HAL CWR-6850E Telereader after 1600Z on 15 meters. QSL to ZS1IS.

WATCH THAT VFO!!

It has become common practice for dxpeditions to transmit in the Extra portion of the bands, and listen up in the Advanced and General portions. A carelessly tuned VFO, causing you to transmit outside your authorized band, can cost you real bucks. The new FCC schedule of fines for breaking Part 97 regulations are not for the faint of heart. The base fine (first offense) for operating on an unauthorized frequency carries a $10,000 price tag. Fortunately for us keyboarders, our digital operating bands are so narrow that we do not have this problem. But when you are operating CW or SSB, be vigilant with your equipment settings. Transmitting material, or words, that are deemed malicious interference can cause a monetary forfeiture of a whopping $17,500. (Tnx St. Paul RC Groundwave)

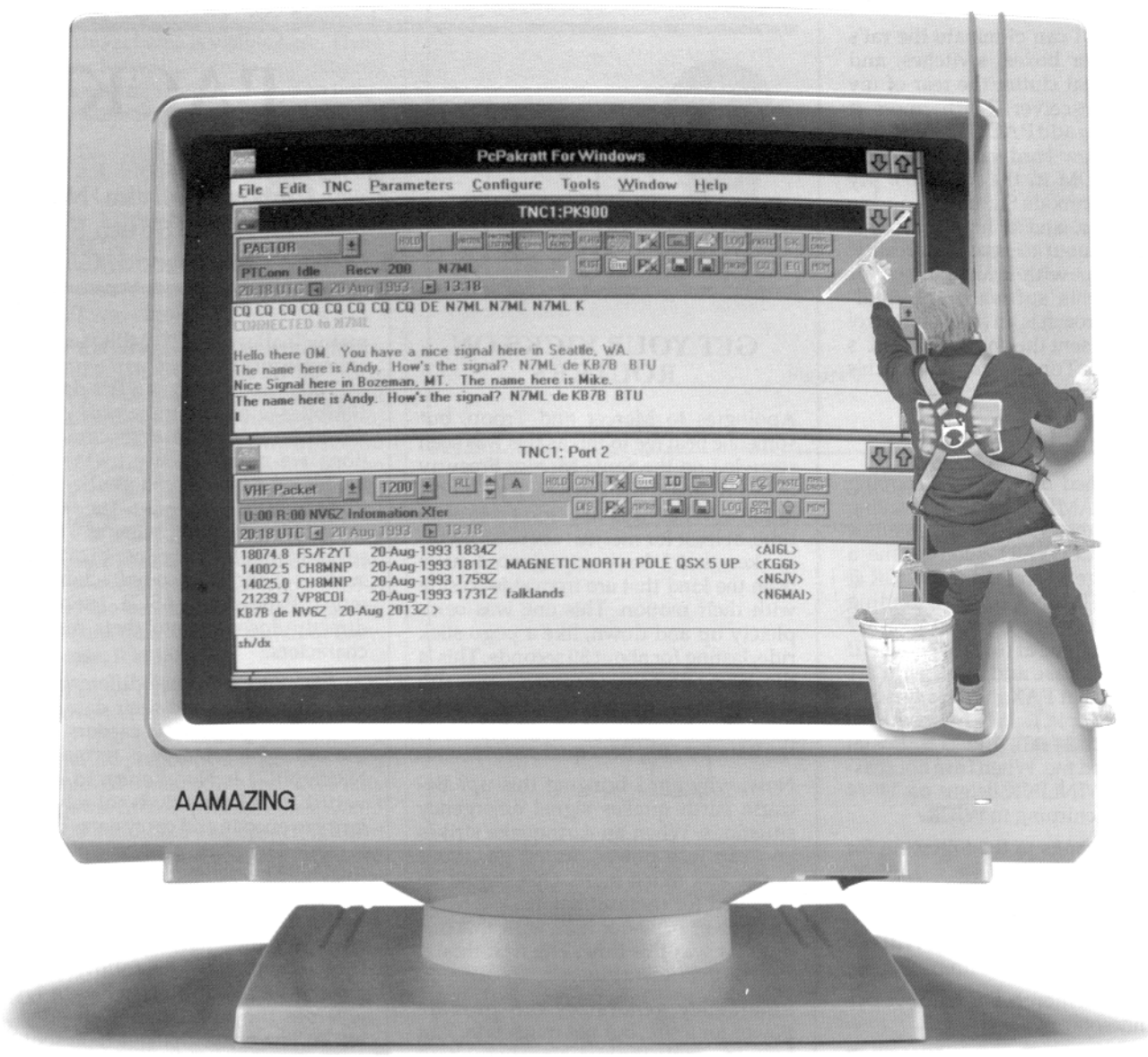
So rather than contribute to reducing the Federal deficit by careless, or thoughtless operating, consider applying your largess to a productive project, like the ADRS Bootstrap Fund.

MORE REFLECTIONS

There is a little progress to report on my venture into a new all-mode station configuration. Bringing WINLINK up was relatively easy. The articles on that subject by Jim Jennings, KE5HE, in the October and December issues of the RDJ, proved to be extremely useful. Since the program documentation is sparse, Jim's guidance saved me many hours of stumbling. WINLINK has it all over its APLINK and PAMS predecessors. It is really a pleasure to run. However my version, which was downloaded from the ADRS bulletin board, contains an icon labeled "HF CLOVER". When that window is selected, there is no sign of reception, not even noise. Furthermore, an attempt to transmit proved just as fruitless. Nowhere did I see any indication that this window is still under development.

I did bring up TY1PS's EXPRESS program for CLOVER, but got bogged down in a plethora of nitty gritty cockpit problems. Here too, the documentation is too meager for my limited computerese. A message was sent to Peter, and if he is true to form, all will be neatly explained in his reply.

I was delighted to see in the January issue of the RDJ that HAL Communications appears to have the answer to the question of handling RTTY, AMTOR, PACTOR, and CLOVER, with one neat software/hardware package. It's availability in February promises to make the PCI-4000 into a multimode data modem. Hurrah for Bill Henry and his resident



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wizards! Now I can eliminate the rat's nest of adapter boxes, switches, and patch cables that clutter the rear of my OMNI VI transceiver. Furthermore it will allow me to add PACTOR operation without any new hardware, other than changing a ROM in the PCI-4000. My Universal Multimode Station, using one HF transceiver, and a highly capable computer, is about to become a reality. For those of us with limited space for equipment, this software/minimal-hardware approach is an answer. Bravo! My order was sent the day I read HAL's announcement. Tune in for next month's thrilling episode.

HAVE DX NEWS?

I can be reached directly by dropping mail into my AMTOR mailbox, leaving a message in the W2TKU/4(1) mailbox (AMTOR or CLOVER), sending me a packet message addressed to W2JGR @ WB0GDB.#STP.MN.USA.NA, finding me on RTTY, telephoning me at (612) 377 7269, or FAXing me at (612) 374 8161. (If you FAX me, please address it with my full name, as that FAX number serves a number of people.) When these high tech approaches fail, the U.S. Postal Service can find me. When I am not chasing DX, my WINLINK listens on 14074 khz. Set your chirping to WJGR.

THANKS - Thanks to the following for all your information: I5FLN. OH2BH/VR2BH, OH2BN, NA2M, W2IYX, WB2CJL, W6GO, NM7M, WS7I, WB9B, AE0Q, ZS5S, and 9X5LJ. Without you there would be no column.

See you all next month. For now bye bye from Minnesota,

PAX....73 de **Jules, W2JGR** ■

1. W2TKU/4 scans 7070, 7076, 14072, 14086, 14078, 21074, and 21080 khz. on AMTOR. On CLOVER, he scans 7066, 7068, 14066, 14068, and 21066 khz.

Next Month

Look for contest rules covering the first Polish RTTY Contest. Mark your calendar for the weekend of April 23rd.

Dayton 94 Hamvention update of program agenda and map of Radisson Inn lay-out.

There is always something new and different right here in the pages of the RDJ. I can hardly wait to get started on the next issue. I hope you can hardly wait until the next issue arrives. We have a fine staff of writers who are dedicated to providing you with up-to-date information about the digital modes. So, stay tuned in, to the RDJ.

PACKET

Richard Polivka, N6NKO
5800 South St., #221
Lakewood, CA 90713

GET YOUR KICKS ON ROUTE 6.6

Apologies to Mercer and Troop, but someone beat me to this as this was seen scrawled on the Santa Monica Freeway in Los Angeles, CA. On January 17, 1994 at 4:31 AM PST was an E ticket ride of all time, at least for me. Just about all earthquakes that I have experienced have been the kind that are from side-to-side with their motion. This one was completely up and down, like a pogo stick ride, lasting for about 30 seconds. This is the second time that my daughter was on a sleepover at a friend's house when a quake has hit. The last one like this was the Landers/Big Bear quakes.

Now, why am I bringing this up? Because earth quakes signal emergency situations. When an earthquake strikes you can lose power, water, gas, your home, and much more. One should be prepared for these situations. We never lost power or water here with this one but that was this time. The next time it may be a different story.

Emergency generators can provide power for a site, but not much else. You have to supply the rest. Now how about your computer, modems, and radios? TNC's/modems can be powered from a 12 VDC source but, the computer and monitor need 120 VAC. Well, that can be helped. PC Power and Cooling of Carlsbad, CA makes a power supply that can help you out. It is called the InnerSource Power Supply. This little gem has a built in UPS that will power the monitor that is plugged into it, as well as powering the computer proper. There is no reason why you can't extend a connector that will allow you to use an outside battery with a larger capacity than what is present in the InnerSource. This system will keep your station up and running for as long as the batteries last.

MLT-3

What the heck is MLT-3? Is it a sandwich, or is it a new dessert that uses ice cream? Not really, it is a new communications protocol used for high speed data communications over wire. Currently this protocol is being employed for the new high speed ethernet over wire. This format will allow for 100 MBit/sec speeds over category 5 twisted pair wiring. Normal ethernet wiring handles data at 10 10Mbit/sec maximum speed. Where is the difference? The data communications we amateurs use in the digital modes is a two level code, either a signal is *present* or is *not present*. Therefore, we use a bi-level coding scheme. There are several formats that we use to carry data, such as a direct encoded scheme, like morse, Baudot, and ASCII. These can be directly decoded into their respective characters.

Packet and Clover use different encoding schemes to send their data. Clover uses four separate data carriers to carry the data. Packet uses a format called NRZI. NRZI is Non Return to Zero Inverted. This format does not rely on polarity to encode and carry data. The data is carried by phase changes and formatting. NRZI was developed for recording digital data on magnetic media. This helps the read process since phase changes represent a one. The following figures will use the following data stream: 1011100101011. In Figure 1, you will see the data stream encoded in NRZI. The phase changes represent the data stream. That is what is so nice about this scheme. On HF, you can receive packet on either USB or LSB, as long as you have the changes present.

The baseband frequency for the data stream is one half of the data rate. Since the data rate is 1200 baud, the baseband frequency is one half, or 600 Hz.

MLT-3 is a tri-level transmission scheme. While NRZI relies on phase changes to carry the information, MLT-3 relies on level changes. Each level change represents a one and no change in level is a zero.

Accordingly, the MLT-3 scheme is a bit harder to decode. NRZI has only two levels to deal with while MLT-3 has to detect phase changes of three levels. You can detect these levels discretely or just look for the level changes. This coding has the same LSB or USB decoding capability as NRZI on HF.

In Figure 2, I show a representation of the data stream encoded into MLT-3. Each level change represents a one and all

three levels are present. The "gracefulness" of this scheme is visible here. There is no direct transition from one extreme level to another. There is always an intermediate step between top and bottom levels.

In Figure 3, I took the liberty of having some fun. I took the waveform presented in Figure 1, (the NRZI waveform) and made that the raw data stream and then converted it to MLT-3. As you can see from the waveform, MLT-3 smoothed out the NRZI waveform.

Now here is what is nice about this encoding scheme. The worst case level shifting in NRZI yields a square wave. The worst case encoding in MLT-3 yields a digital representation of a sine wave. If you smooth this out, the frequency of the baseband signal is one quarter the data rate. Suppose you send out 1200 baud data that is encoded NRZI, the outgoing data rate will be 600 Hz maximum. However, if you feed that signal into a MLT-3 encoder, the baseband signal frequency drops to one quarter the input frequency. In this case, it is 150 Hz.

Fancy this; we have taken 1200 baud data and converted it to 150 Hz baseband frequency. That represents a reduction of baseband frequency by a factor of 8. This was achieved by encoding the NRZI data through the MLT-3 process. This would take 9600 baud data and crunch it down to 1200 Hz baseband frequency. Could you imagine sending 9600 baud packet on HF? Yes it is possible with this type of formatting. Here is another idea. We presently can send 9600 baud packet on VHF. The baseband frequency on VHF is 4800 baud. Now let's work this backward. Take 4800 baud and multiply it by the 4 times data speed rate that MLT-3 gives us. That yields 19,200 baud. Now multiply this by 2 because of NRZI encoding and your yield is 38,400 baud of raw data rate. *Speed demon time!* Admittedly, this is on paper and hasn't been proven in reality. But, it will be coming soon to a wire line near me. Unfortunately, this scheme is not possible over the air because MLT-3 encoding is not allowed on any of the amateur bands. How about an STA for this method, maybe it will last as long as the STA for SkipNet.

de **Richard, N6NKO** ■

Packet: n6nko@wb6ymh-2

Internet: swc!owlsnest!richardp@cerritos.edu

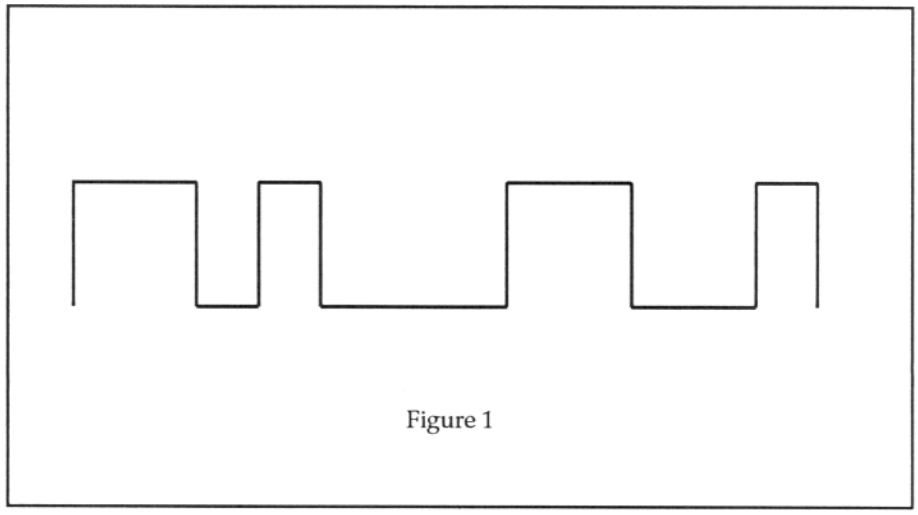

Figure 1

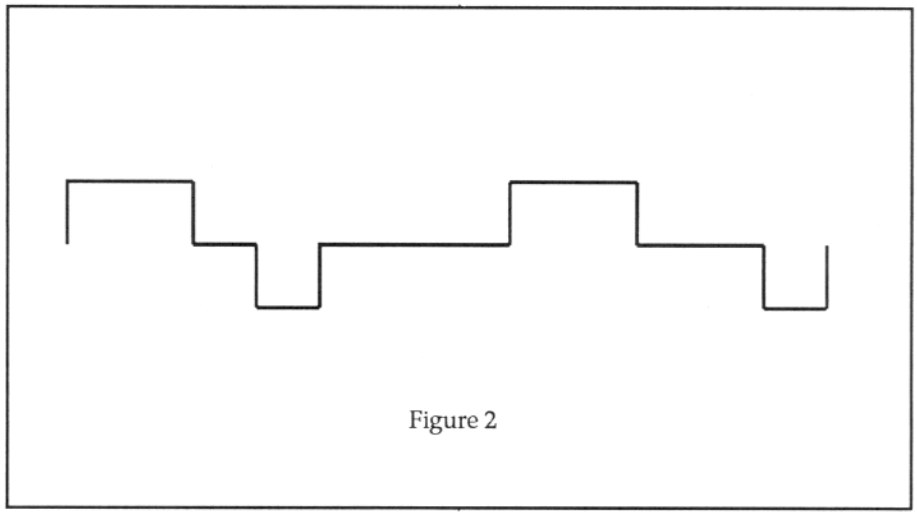

Figure 2

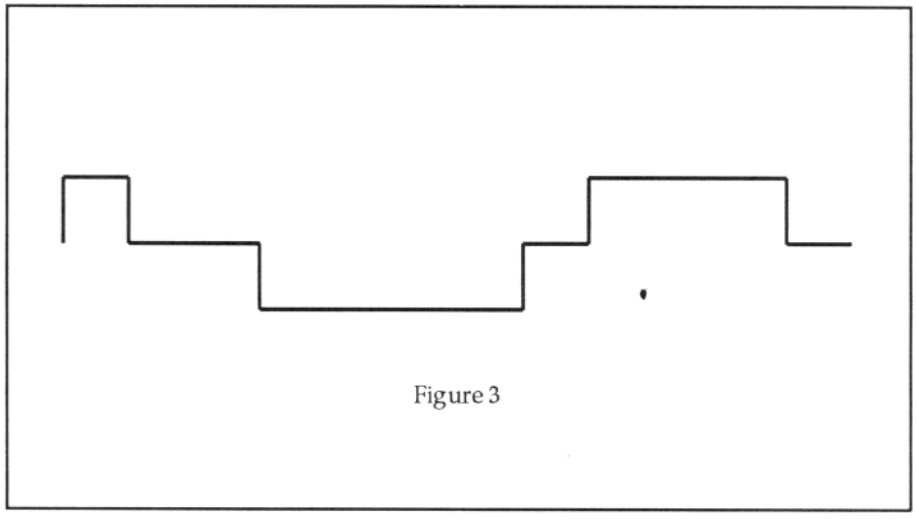

Figure 3

SOFTWARE

Jim Mortensen, N2HOS
P.O. BOX 328
Indian Rocks Bch, FL. 34635

TALK TO ME!

The weather has been terrible! On this 20th day of January I have just left Laguardia airport amid temperatures of five degrees above zero. I arrived yesterday morning when the minus three reading broke all records for the New York area. Driving the 100 mile round trip to a client meeting on Long Island consumed four hours of the day and two times my capacity for icy roadways. This morning's adventure included a missed flight because the car taking me to the airport sat in the ditch instead of at my front door. This has not been what we would call a triumphant journey but I could live with such travail except for one thing. I'm hyped out!

Bad weather is bad enough but bad weather made intolerably bad by media hype is unbearable. Driving for two hours in the New York radio boiler room makes a difficult task impossible. Roads are not merely icy, they are "treacherous and responsible for at least 69 deaths." Temperatures are not low, they are "lower than ever recorded." It is not just cold, but we have to listen to outrageous media inventions like "wind chill factors." The airport, at a historic low of three below zero--a remarkable statement--must be subjected to the "thirty five degrees below zero wind chill due to the dangerous, life-threatening northwest winds of fifteen miles per hour." Egad, by the time I arrived at the house I was freezing to death in the car (where the external, on-the-windshield wind chill factor, driving at 55 MPH into the northwest wind might have been almost as bad as the reading at the time of the kickoff in the Buffalo Bills/Los Angeles Raiders football game) despite heroic efforts by the very reliable heater. The "hype-chill" factor was minus 30 degrees! If we lived in Chicago, it would be one hundred times worse!!

Techno-hype reaches the same dizzying heights. These days, when we order the very latest and highest powered PC, the one designed to last throughout the next generation of hardware development, the machine is obsolete by the time we end the conversation with the order desk! Within minutes, or days or no more than weeks, the media inform us of the multi-media breakthroughs that make us all out of date. By the time the machine arrives at the front door we feel our terrible error in ordering such old technology and begin to plan our strategy for catching up with the new frontier.

Hardware is not alone. Version 5.9 of your favorite software announces itself (at an inexpensive upgrade price of $99.95) at least one year before you work your way through the tutorial that came with V4.9. Finally, we order V5.9 just days before we read about V6.7, the one that solves all the problems of previous versions! We receive the new bundle, only to be made aware that our hard disk space and our CPU is now totally inadequate for such new technology. Thus we are forced back into the endless loop the hardware cycle represents.

Hype not fact creates most of this frenzy. And it comes about because the promoters among us revel not in the celebration of today's successes but in tomorrow's vaporous promise. The facts relating to this year's readily documented productive accomplishments are the relevant issue. But the more sensational stories like the theoretically unlimited blue sky of tomorrow's neural networks, satellites, information-highway-500-channel-interactivity, or even the very latest discovery unearthed in a press release by the "ten clock news" gang. If we accept the unfiltered version of their report we must suffer in our house or office, burdened with last year's leftovers. This belittles what we do with what we have in the way of technology, through their endless descriptions of the intergalactic nirvana just around the corner. Too bad, for it is today's technology that is the good news, that deserves a salute, a celebration, a marching band. Most of us benefit every day of the week from its presence. But good news never makes the headlines.

Let's change that stupid rule and talk about good, exciting news that is about to turn at least part of the world upside down. No vaporware here, this is the real thing, in a real office, with real people doing real jobs. You will see how it can have near-term impact on how we practice the digital modes. This needs no introduction. The following letter was received recently via CompuServe from my good friend Charles, NX2T.

Dear Jim,

This letter is written to you with the new IBM Personal dictation system. At first, it was a little hard to get used to. But both the computer and I make progress each day.

I will use this dictation system to dictate directly into patient's charts. It will hopefully speed up the accuracy and quality of my records. It will allow me to keep electronic charts and eventually do away with paper charts completely.

IBM came to install my voice system on a trial and experimental basis. It consists of a voice card and a voice recognition program. The system requires OS/2 and a fast computer to work correctly. I have a 486/33 machine. IBM recommends at least 16 megs of memory but I have 24 installed. All of it installed easily. The program has a vocabulary of 20,000 words and a separate medical vocabulary of 20,000 words. To accommodate this large a vocabulary, it is necessary to train the system and to speak in discrete words so the computer can distinguish individual words. I feel a little like I am talking to the computer Hal in the film 2001.

I installed the system with a Heil mike. This gives a frequency cutoff which minimizes extraneous noises like the telephone. This is on a boom which keeps my hands free to use a medical chart. The system has learned my patter of speech with this mike. Any other mike would require another training session.

Training consisted of speaking into the computer for about two hours. This speech information is compiled into a speech signature. The compilation takes about eight hours of computer time and ran overnight. Training is standardized by using a ghost story by Mark Twain.

There are two basic ways of using the voice system. Voice control allows me to command computer operation. Macros are easily designed from keystrokes. Complex sets of opening or closing both windows and programs can be combined into one word commands. Multiple programs run at the same time and can be easily controlled.

Dictation is accomplished by opening a dictation window. The spoken word appears in this window as text. Errors are easily corrected by of the mouse, and each correction adds information to increase accuracy of computer dictation. Word correction is done easily with the right mouse button. The computer gives eight alternatives. Select and click the appropriate word. Most often the computerized choices include the correct word. Each correction improves the performance the next time around.

The computer corrects the grammar of my text by looking at the probability of occurrence of the surrounding three words. It gets the punctuation and spelling of the words correctly by looking at the surrounding text and will distinguish words like "to," "two," and "too;" or "colon" and ":."

I can see the computer dictation improving with each paragraph that I correct and dictate. Saving a dictation improves computer recognition of my speech. I still sound like "Hal" but my error rate is down and the production of text is speeding up regularly.

I hope this description of my system helps you. In the future direct production of text from speech could be coupled directly to any digital mode. This gives us exciting possibilities for narrow band transmission of speech data in the near future.

Best wishes to you and Gen

Charles NX2T

Well, there is the "here and now," not the "when and if" story of today's capacity for converting fantasy to reality. Frankly it impresses me no end. I am of course, acutely aware of what it means to a handicapped person who has limited use of the hands, and to whom a keyboard is a Mt. Everest. That use, fine as it might be, is but the tiniest tip of the iceberg. Bringing this technology into practical use is no less revolutionary than the typewriter or the original \copier machine. It changes forever the relationship between the operator and the 486 machine and perhaps marks the beginning of software's complete dominance of the hardware, a phenomenon long awaited by us all.

When will we see it in connected to our radio? How much will it cost? Who is going to make the product for us? Will it work on Pactor or Clover? What speed can we get in a 500hz bandwidth? There are no answers at this point. We can but speculate. Hopefully someone out there has seen this product do its work and now shares my enthusiasm for its potential in the amateur world.

NOTES

I want to insert another plug here for the ARRL insurance plan. When I finally got all of the pieces together after the lightning "event," I merely sent the paid bills to the claims agent. Within a few days I had a post card acknowledgement, and a few days later a check. No arguments, no hassle, just a check. If you don't have the coverage, I urge you to protect your gear, including your computer. It's worth every nickel and then some.

OS/2 2.1 isn't dead despite premature reports to the contrary. It is very much alive. Finally, after being ignored by most of the computer press for months, we begin to hear very positive things about this "other" operating system. Perhaps Windows doesn't own the entire world after all.

I fell for IBM's recent ads about OS/2 for Windows 3.1. The promises are tantalizing and I finally decided that I might give it a whirl when things settled down here a bit. I just have a hunch that some of the conflict problems inherent in Windows might ease a bit. So, I called my friend Clark W9CD, OS/2 user from day one, and asked for his evaluation. He praised it as he has since the beginning. The next thing I knew Clark sent along some propaganda as well. Seems like there is this guy out in Portland, OR who runs a four port Fidonet BBS.

He tried Win3.1. "Good luck. It barely could handle one port, even with 16550 UART." Next Windows NT. "It handled two lines, barely, and was reliable only up to 19200 baud." Then, the big switch to OS/2. "I currently run five lines plus a port on Usenet gating. Throughput is always greater than what I was getting before. The machine has been running for two months now with no down time." A very favorable bulletin from a very heavy user!

At this moment, a new challenge is not a priority! But then, if it is that good . . .

Staples Part II, originally scheduled for this month is complete but will await its turn. Watch for it in March.

73 de **JIM, N2HOS** SK ■

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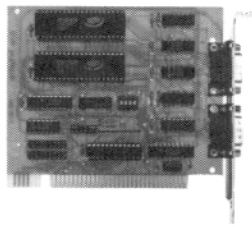

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UPDATE

Jim Jennings, KE5HE
Rt 2 Box 165E
Hearne, TX. 77859

Welcome to a new column. I hope that I can live up to Jim Mortensen's expectations. I was getting a little uncomfortable doing the LINK since I no longer have a MBO running. Being out here in the semi wilds of east Texas means that folks have to feed new information to me. I will certainly appreciate any and all that comes my way. I have given you the pertinent information in the byline. My FAX is up when I am in town.

MINIPROP PLUS version 2.0

Jim, N2HOS, passes along the information that W6EL Software has announced a new version of MINIPROP PLUS. New features include an adjustment for the "K" index from WWV and a frequency map of the world. The frequency map shows predictions to 57 areas of the world and can be automatically updated every 5 minutes. All original features remain, but the speed of execution of the program has been significantly increased. Prices are $60 US and Canada and $65 elsewhere. Upgrades to registered users are $25 and $28.

RELAY

The following information is relayed by Paul Richter, W4ZB.

Thanks Paul.

Paul Rinaldo, W4RI, was present at the AMRAD meeting in Northern Virginia and advised that the FCC is expected to approve, within the next 2 months, a final order opening the 219-220 subband for shared ham use. Ham use is not expected to restricted except along the Mississippi and in the Gulf States where a narrowband commercial network exists for ship to shore communications. In addition, Rinaldo said that the ARRL is attempting to work out a voluntary bandplan that would favor broadband ham uses, primarily 56 kBaud packet trunking systems. Each such 56 kBaud packet channel would require about 100 kHz bandwidth.

There was some informal discussion about digitized speech and vocoder developments. Someone said that he had seen one of the inexpensive Qualcomm vocoder/compression chip sets successfully working with real time, fully natural sounding speech at 9.6 kBaud. (It will not be long before all radio transmissions, including voice, will be digital. With that technology, your filters can be tailored and they will just be software instead of crystals).

Terry Fox, WB4JFI, is presently bringing up a complex, multiport computer BBS type of system that has several landline modems as well as VHF and UHF packet radio ports. The overall system includes several separate PC/AT type computers connected together by a "thin" ETHERNET network, running different operating systems (UNIX variant and DOS). A series of different applications are present which support the central BBS and the various ports and applications. The system not only permits traditional BBS type messaging functions, but also allows users to have access to the different ports of the system and to execute UNIX and/or DOS application software.

A similar setup is being used by Peter Detwiler, WA2MFY. This Super Station was reported in the October 1993 issue of the RTTY DIGITAL Journal. Paul says that a good article or two on how to do this in the RTTY DIGITAL Journal might save some of the trusty old '286s from the junk heap and put them to good use. I agree.

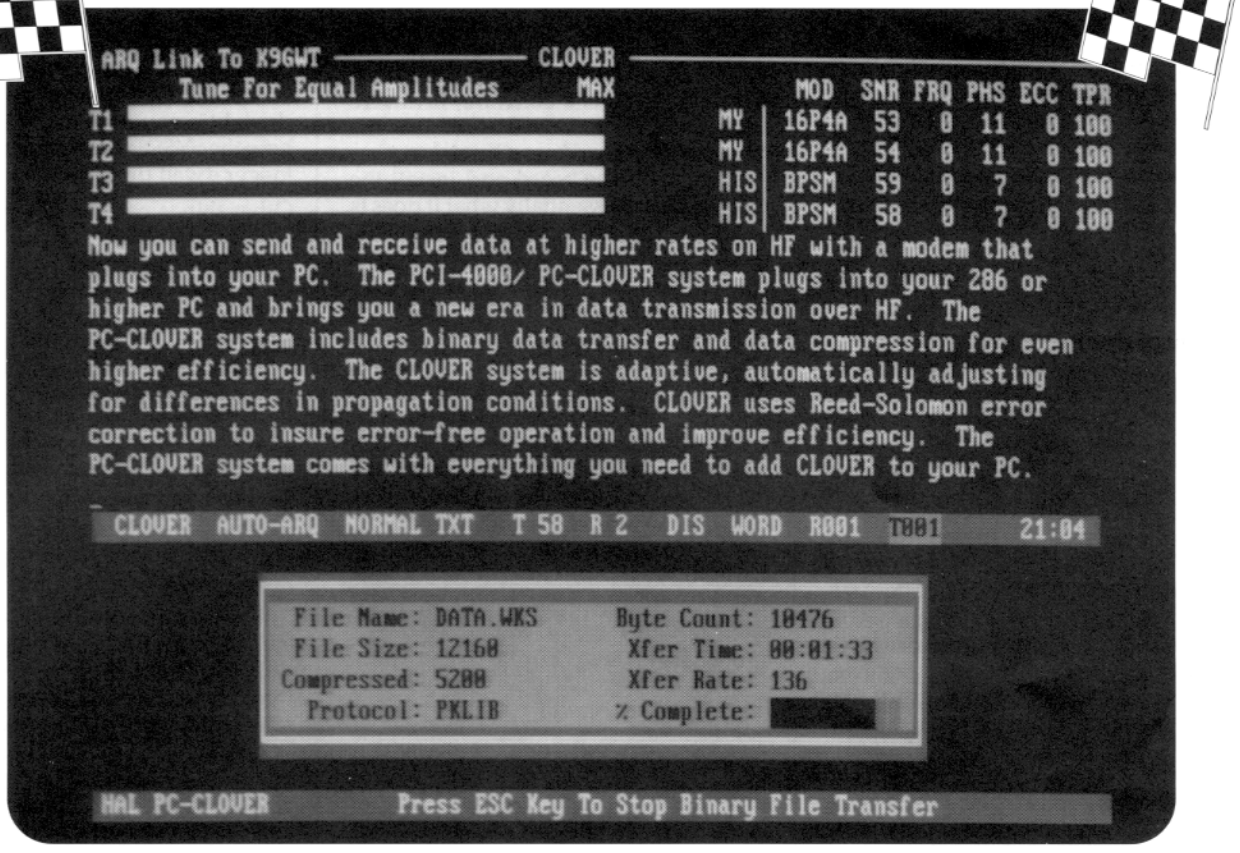
For those of you that are CLOVER users, Paul says that he saw an interesting product advertized in the Jan 94 issue of Byte. It is a color frame grabber for TV, VCR or camcorder that converts the video frame into various image file formats for about $250. That is a lot less expensive than a good color video scanner.

DRSI apparently has some plug in boards that handle AX.25 packet at 56 kBaud. Any information would be appreciated. Also SCS Gmbh (Pactor), has recently packaged the Pactor product on a plug in board (al la HAL PCI-3000) which is selling in Europe. That Pactor/AMTOR/RTTY/CW board got a several page review spread in the 10/93 CQ-DL.

Paul mentioned that he had acquired an 8-port COM port board by BOCA. This card only uses one IRQ but will require the use of drivers and TSR's for use on Windows and DOS. The board is equipped with 16550 high speed chips. I have seen the IOAT66 card by BOCA that has 6 ports. You can use a shared IRQ for that one or you can use different IRQs for each port. The board allows jumper access to the high order IRQs. It is quite easy to use this board on Windows (or by using MBBIOS on DOS) since both environments allow the use of non standard IRQs and thereby easily get 6 serial ports on any AT class machine.

AEA PK-96

HAL DOES IT *FASTER*



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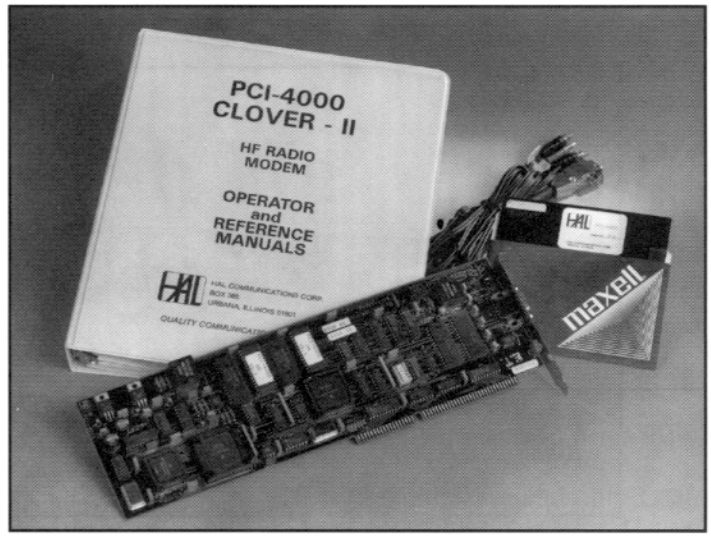

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CIRCLE 143 ON READER SERVICE CARD

FROM AEA

I got the following information from Richard Stuart at AEA. AEA has announced the PK-96, a packet controller that does 1200 baud as well as the 9600 baud. The 1200 baud data controller is the standard AFSK tone signaling and the 9600 baud feature is K9NG and G3RUH compatible direct frequency modulation. Not only is the PK-96 suited for terrestrial or satellite work, it can be used for high speed data links between packet systems. The PK-96 comes with MailDrop, HOST mode, and other special commands such as KISS, PERSISTENCE, and SLOTTIME.

You are probably aware of the new PK-900 (upgrade) features. The PK-900 now includes Pactor and Gateway in addition to a 9600 baud plug in option.

There are a couple of accessories for the DSP-2232/1232. They are WeFax 256 and the ST-1 Satellite Tracker. WeFax 256 is a Windows program for WEFAX display that displays in real time true grayscale images from either the NOAA HF WeFax Service or the NOAA APT Satellite Service. The program provides for both 500 and 250 pixels per line. There are a bunch of other features like an Auto Clock for starting the program, an Image Processor, and a scrollable receive buffer. The ST-1 Satellite Tracker automatically controls the Yaesu 5400/5600 Azimuth-Elevation rotors. It may also be used with 2 independent rotors. This hardware works with InstantTrack, QuickTrack and RealTrack software and is compatible with the later Yaesu, Kenwood and Icom transceivers. It uses one serial port and one parallel port on the host computer. The serial port is automatically switched out when the ST-1 is not in use.

FROM HAL
NEW PCI-4000 UPGRADE

I had a chat with Bill Henry, K9GWT, of HAL Communications about their new products. They have 2 that are really different. First, let us discuss the PCI-4000/M (for multimode) upgrade. This upgrade ($100) is a software/firmware upgrade to the PCI-4000 board that the user can perform. You will need to plug in 2 chips on the board and install the new software. Essentially what it does is to allow the keyboarder to use FSK modes on the PCI-4000. The FSK modes allowed are RTTY (Baudot or ASCII), AMTOR and Pactor. The DSP filters are optimized for each mode. The PC-CLOVER terminal program now has a new CODE menu item that allows for the selection of CLOVER or FSK modes. When you select CLOVER, the PCC.S28 and PCC.LOD code are loaded from the PC to the PCI-4000. When you select FSK, the PCCFSK.S28 and PCCFSK.LOD modules are loaded. At the present time, the memory (RAM) capacity of the PCI-4000 is not large enough to accommodate both. As I used to tell my dad when I was a youngster, "The hoss is too high and the saddle is to heavy." So for the time being there will be no automatic mode switching as is now done on the PK-232 with AMTOR/Pactor.

However, HAL has in the works the PCI-4000/MB upgrade. This is multimode plus automatic switching between modes. The PCI-4000/MB will listen on a frequency and respond automatically if called in CLOVER, AMTOR, or Pactor. This upgrade will require more RAM and PCI-4000 owners desiring this upgrade will have to send the board back to the factory for modification. The anticipated price is $250 and it is expected to be available by the time of the Dayton Hamvention. There are several steps that the software has to go through in order to determine first whether the signal is CLOVER or FSK. If it is FSK then it has to determine if it is AMTOR or Pactor. Bill thinks that this can be done in about 5 seconds. So, it appears to me that some thought is going to have to be given as to how the SYSOPS are going to handle this longer dwell time on each channel.

Other things coming down the pike include direct control of the transceiver mode, frequency, etc. via a computer port rather than relying on the use of whatever memory scan feature that may be present on the radio. This requires some up front development, but will allow many nice features to come along for the ride. You would be able to select specific modes for specific frequencies, time of day control for which frequencies are scanned and even beam heading control. HF networking is truly in its infancy and HAM radio is in the middle of all of it.

Bill also told me about the HALCO RVM-100 Radio Voice Mail Controller. This is a simple little box that goes between a VHF or UHF transceiver and a standard telephone answering machine. When someone calls on your frequency and uses your DTMF access code your recorded message on the answering machine is played back. You include station identification in the recorded message. The user leaves his message followed by a # sign. That's all there is to it. It sells for $169. At this time you cannot pick up your messages by radio as there is a question about the legality of that (third party traffic).

Well, that's it for this month.

God Bless and 73 de **Jim, KE5HE** ■

AEA ST-1

REVIEW

LOGIC III

by: Phil Sussman, KB8LUJ

LOGIC III is a computer program designed primarily for the IBM-PC (and compatibles) by Dennis Hevener, WN4AZY. He is a well rounded person (his biography and call sign history make interesting reading) who has mixed the experience of ham radio with a God-given gift for bits and bytes. The result is a program that can best be described as 'complete hamshack management.'

Here is a brief overview:

I. Logging: Logic III records QSO information and provides:

A. Callsign look-up (have I logged this guy before and if so retrieves certain info like name & QTH)

B. Provides info on the distance/direction (both short and long path), Sunrise/sunset times, DXCC country, etc.

C. Does a callsign lookup (provided you have a callsign database)

D. Does a QSL manager lookup (provided you have a QSL mgr. database)

E. Reads the RF frequency (provided your rig has a computer port and you have connected an interface adaptor)

F. Sets/rotates antenna (if your rotor has an RS-232 interface)

G. On line award tracking, like DXCC, WAS, etc, any band or mode

H. Allows you to create/save certain user defined fields (up to 5)

I. On line QSL tracking. When a new call is entered, program lets you know if you have that band and mode confirmed/worked with that DXCC country.

J. Monitors and responds to PACKET CLUSTER spots with awards status.

K. 135Kb of on-line help

L. Data terminal and Packet Cluster interfacing

II. Tracking: Logic III records and tracks award information and provides:

A. Logbook searches and printing of all or selected criteria

B. Awards reports. DXCC (or other awards) worked, confirmed or needed

C. Award need report. Prints a list of unconfirmed or unworked needs

D. Multi-band/mode progress reports

E. Callsigns by prefix worked reports

F. Contest reports and dupe files

G. Cleanup and reindexing of all files

H. DX distance and direction charts

I. Sunrise/sunset reports

J. Callsign prefix charts

III. Contests: Logic III can customize a logging screen for a contest

A. Logs only certain criteria desired for the contest

B. tracks dupes and records a dupe file

C. Assigns QSO numbers if required

D. Prints contest reports

IV. Import/Export: Logic III stores files in dBase format and allows:

A. Import of files for incorporation to the log/award files

B. Export of dBase files for use by other programs

V. Backup: Logic III records can be saved/restored:

A. Compress and store database files on floppy diske log/award files

B. Read compressed files from floppy, decompress and restore data

VI. Memory management: Logic III monitors and displays memory management information. This is done on line.

A. Failures/errors generate an error file/report for later study

B. A dump of all parameters can be done for error tracking

VII. Flexibility: Logic III has a lot of flexible features

A. Bands and modes can be added/changed or updated at will.

B. Two or four digit years can be selected (ready for year 2000) or changed without disrupting (changing) existing data format.

C. Display of date (MM-DD-YY or DD-MM-YY) can be changed without affecting database storage.

D. Detects proper color/monochrome display (including enhancements)

E. Automatic field exist (selectable)

F. Bandchart checks frequency/mode validity

G. Prefix table with over 4000 entries can be modified by user.

H. Latitude and longitude are not coded and can be changed as needed.

I. Callsign of user can be changed, but with common records. This allows a club or contest station to 'pull' the log of any one operator's callsign for a report.

J. Automatic UTC offset (including fractions of an hour, too)

K. Multiple databases allowed, limited only by disk capacity.

INSTALLATION

The program is big and complex; however, installation is relatively simple. After the install is run, you set the default parameters by menu. The program will run under Windows (c.Microsoft) but I don't recommend it until you have gained some experience with the program.

Here are a few suggestions:

* You do not need to use every possible feature right away. Just set what you want to use for initial needs.

* Use as many of the default settings as you can (at least initially)

* Approach configuration one step at a time with manual in hand.

* Don't attempt to configure LOGIC III if you are fatigued.

* The average ham will not use many of the program features.

One key to being successful with LOGIC III is not to become intimidated. You are not going to quickly run this program in

I Only Wish He Lived NextDoor!

a matter of minutes. It will take some work and study. In addition, it takes practice and patience. Some hams may take a quick look at this program, become bewildered, and give up without even trying.

NEW AND IMPROVED

Logic has been available for a number of years. Logic III was introduced in 1992 and currently is up to version 3.02 which includes Logic, Jr, a simpler logging program. The manual is divided into two parts and covers about 75 pages. There is significantly more help/information contained on disk.

CONTESTING

LOGIC III is not designed as slick contesting software. It does allow you to run contests and provides accurate results. Other software might be faster, but none is as accurate. In fact some contesters import data from their contest program in LOGIC III for general log storage and for award tracking purposes. It can also be used to generate contest specific reports.

ON THE CLUSTER

For most anyone who chases DX, using digital or not, a Packet Cluster offers a wealth of information. Unlike a usual Packet BBS where a user logs on, obtains whatever information he wants, and then logs off; a Packet Cluster keeps a multitude of user connections active and 'feeds' DX spotting announcements, WWV flux reports, and other general information to all of the connected users. Several clusters are usually tied together through nodes and information distributed throughout the entire network.

LOGIC III can use a com port to monitor a local cluster and display spots and other information in a format/select mode that you desire.

MY WISH LIST

LOGIC III is imposing. Sometimes discovering operational information is hard and initally you may find need of technical support. To his credit, Dennis has a technical service help line with a nice touch..if he's not available, the line goes unanswered, so you don't waste phone calls.

It would be nice if there was a little 'handbook' that covered initial installation. Another idea would be to have a 'crib sheet'.

ATTA BOY

LOGIC III has a lot of useful features not found in any other software. It took years to develop and is continually being updated. Dennis publishes a regular newsletter (more like a small newspaper) called "LOGicLines" which provides upgrade information as well as other related articles. These articles cover tracing RFI problems, discussing serial port communications, or trouble shooting IBM software problems.

You might say Dennis is a programming wizard. I only wish he lived next door.

OVERALL

Well, with so much to cover, you can see that addressing any one mode or feature is going to take a bit of time. (ie. space). So in the future, I intend to spotlight certain features individually. So stay tuned!

LOGIC III is not a quick program to digest but it is easy to run. It offers a lot of features with excellent results. Luckily the cost is relatively inexpensive, and you can quickly become addicited to its ease and reliability. If you're looking for a comprehensive logging program, LOGIC III certainly deserves a good look.

LOGIC III is only available from a PDA, Personal Database Applications, 2616 Meadowridge Drive, Duluth, GEORGIA 30136-6037, USA. If you'd like more information, or a copy of LOGicLines, give Dennis a call. The phone is (404) 242-0887 and FAX (404) 449-6687. Currently the initial program cost is $79.00US and the QSL manager database is an addition $10.00US.(plus shipping)

You may have seen the PDA logo of an elephant's face with an owl perched its trunk. The pair, known as 'Hosenose' and 'Hootowl' adorn T-shirts. According to Dennis, proceeds from sale of these T-shirts go to preserve that endangered species - - computer programmers willing to work for peanuts.

Thanks for reading and sharing your time with me.

de **Phil - KB8LUJ.** May God

LOOKING BACK

- FCC acts on petition filed by Keith Peterson, W8SDZ, that approves speeds higher than 60 WPM.
- John, W3KV, confirms 100 countries. Dusty, W8CQ, awards DXCC plaaque # 2. Jean, FG7XT, reports 110/102 but does not ssubmit cards.
- DL8VX, trying for permit to operate RTTY from the Vatican. Wolf will try C31, Andorra. RTTY not allowed from OH0, Aland Island. Machines may soon be available in Poland and Bulgaria.
- Gin, JA1ACB, reports new one, UK9OAA, zone 18. Gin trying to activate another one, JT1KAA. RTTY still banned in Burma and Thailand.
- FSK mod for KWS-1 described. Switch selects 170 or 850 shift.
- Three stations top 3 million in CARTG contest. I1KG, W3KV, and I6CGE. About 95% of QSOs in contest were at 170 shift. WB6RXM places 40th.
- Slow typers using 100 and 75 WPM. Proposals made to indicate speed with the CW ID or by using different tones (helpful to autostart).

Submitted by Carl, K6WZ/0

ED: This is the last in the series submitted by Carl. The ADRS is looking for someone who would like to continue this feature of the magazine. Obviously, it will take someone who has a good collection of back issues of the RDJ. If you would like to volunteer for this feature, please contact me at your earliest convenience.

CONTESTING

Richard Lawton, N6GG
14395 Bevers Way
Pioneer, CA 95666

RTTY Contests - Coming Event

All rules + logsheets are in the RTTY Contester's Guide

Date:	Contest:
MAR 6	DARC CORONA 10M DIGITAL (German)
MAR 19-21	BARTG WW RTTY (British)
APR 16-17	SARTG WW AMTOR (Swedish)
MAY 14-15	VOLTA RTTY DX (Italian)
JUN 11-12	ANARTS WW DIGITAL (Australian)

-- -- -- REMINDERS: -- -- --

EA WW RTTY Contest log entries mailing deadline: April 9, 1994.

Mail logs to:

EA RTTY Contest Manager
Antonio Alcolado, EA1MV
P.O.BOX 240
09400 Aranda de Duero (Burgos)
SPAIN

DARC HF RTTY Contest log entries mailing deadline: May 1, 1994.

Mail logs to:

Werner LUDWIG, DF5BX
P.O.Box 12 70
D-49110 Georgsmarienhutte
GERMANY

-- -- -- COMING UP -- -- --

DARC CORONA 10M Digital Contest

March 6, 1994

Sponsored by Deutscher Amateur-Radio-Club e.V. (DARC)

CONTEST PERIOD: Sunday, March 6, from 1100Z to 1700Z (6 hours)

NOTE: *Contest will take place on the first Sunday of March, July, September, and November of each year.*

MODES: RTTY, AMTOR, PACTOR, and CLOVER

BANDS: 10M ONLY

CLASSES: A - Single op B - multi- op C - SWL

CONTEST CALL:

for RTTY: **"CQ CORONA TEST DE ....."**

for AMTOR/PACTOR: **use FEC (mode B) for "CQ CORONA TEST de sell call XXXX"**

Use ARQ (mode A) for answering and contest exchange. Contest exchange in any other mode is subject to disqualification.

EXCHANGE: USA stations: send RST + QSO nr. + name + State

All others: send RST + QSO nr. + name

CONTACTS: Additional QSOs are allowed with same station on different mode after a 15 minute interval, or after a QSO with another station.

MULTIPLIERS: Each DXCC/WAE country, and each USA state, and each call district in JA, VE, and VK, (NOT USA). Count only the first QSO with a USAs tation as a DXCC/WAE country multiplier.

QSO POINTS: Count 1 point for each completed QSO.

FINAL SCORE: Total QSOs x total multipliers.

AWARDS: To top stations in each class, country, and district mentioned above.

LOGS: Use separate logsheets for each mode. Logsheets must contain: Date, Mode, Time UTC, Callsign, message sent/received, name, USA-State, first-time multiplier prefix, and QSO points. Also required is a Summary sheet with a list of claimed multipliers. If entry is multi-op, please list names and callsigns of all ops. Comments are very much appreciated.

DEADLINES: All logs must be received by 60 days after the Contest .

Mail to:

Werner LUDWIG, DF5BX
P.O. Box 12 70
D--49110 Georgsmarienhutte
GERMANY

COMMENTS: This is an all-digital 10M contest, except for HF Packet, and it is 6 hours long. It occurs on Sundays, 4 times a year. There are no multipliers for USA call areas. Just the STATES count for mults. This means that only your FIRST USA QSO in the contest will count for a DXCC/WAE country mult, along with the State mult. No indication was made about counting multipliers again after changing digital modes. No mention was made in the official rules about how to count KH6/KL7. Are they USA states or separate countries? Most contest rules count them as separate countries. I plan to do that. It makes more sense and is less confusing. With the propagation forecasts looking rather poor for 10M, this Contest will really be a 6-hour challenge. Let's see if the really high power stations can ionize some paths for us. Stay tuned (up) .

BARTG WW RTTY Contest

March 19-21, 1994

Sponsored by British Amateur Radio Teledata Group.

Contest Period: from 0200Z Saturday to 0200Z Monday (48 hours)

Maximum operating time allowed: 30 hours for single op and SWL en tries.

Multi-operator stations may operate the full 48 hours. The 18 hours of rest periods may not be less than 3 hours each. Times off operation must be shown on contest summary sheet.

BANDS: 80, 40, 20, 15, and 10M **MODE:** RTTY only

CLASSES: A) Single op, all band C) Multi-op, all band

B) Single op, single band D) SWL

EXCHANGE: Send: RST + QSO number + Time in UTC

MULTIPLIERS: Each DXCC country, including first QSO with W, VE an d VK, counts as a multiplier on each band. Each call district in W, VE, and VK will count as an additional multliplier. Also, each continent (6) will count once, not once per band.

QSO POINTS: Count 1 point per QSO

FINAL SCORE: Total QSOs x total multipliers x number of continent s (max 6)

LOGS: Use separate logsheets for each band. Logs must show: BAND , DATE and TIME (UTC), CALLSIGN, MESSAGE Sent and Received, COUNTRIES and PO INTS claimed.

Summary sheet must show full scoring, times of operation, and address for correspondence.

Logsheets, summary sheets and multiplier and dupesheets are all available for copying from the **RTTY Contester's Guide**, published by RTTY Journal.

Logs must be received by May 25 to qualify.

Mail logs to:

BARTG c/o John Barber, G4SKA
32 Wellbrook Street
Tiverton, Devon
EX16 5JW, ENGLAND

COMMENTS: This is a 48 hour contest, but only 30 hours operating time allowed for single ops. The time off periods must be 3 hours minimum length and listed in the summary sheet. This contest gets great activity from all over the world. Try to plan your off times to be during the least productive time of day, such as when propagation does not favor your area. The fact that W/VE/VK call areas count as separate countries on each band means that CQing should be the most productive way to make a good score for the W/VE/VK ops. Also, band multipliers helps to alleviate the QRM on the high bands, by spreading out the CQers to other bands. Finally, don't forget the WAC bonus of six multipliers.

-+- High Claimed Scores -+-

1994 ARRL ROUNDUP

High Claimed Scores

(gathered by Ron AB5KD, and Rich N6GG)

SINGLE OP. HI POWER

Call	QSOs	Mults	Score
KP2N	1225	92	112K
WA7EGA	1060	100	106K
WA7AVD	1024	97	99K
AB5KD	998	100	99K
NV1G	905	104	94K
WF5T	850	90	76K
AB8K	700	100	70K
WF5E	737	85	62K
NN2G	623	92	57K
NO2T	523	106	55K
K1IU	653	82	53K
N6GG	601	86	51K
KN6DV	651	74	48K
WB6SDM	549	75	41K
K2TW	446	92	41K
WB2EAR	495	73	36K
WF1B	400	69	29K
NA4M	215	40	8K

SINGLE OP. LO POWER

WS7I	938	99	92K
C6A/AA5AU	703	82	57K
AA4M/6	691	82	56K
KE6XJ	635	82	52K
K7GS	374	84	31K
NY2U	290	60	17K
W6/G0AZT	261	63	16K
KU4A	211	59	12K
N2LBS	93	33	3K
WU1F	63	35	2K

MULTI-OP. SINGLE XMTR

K9RS	1045	102	106K
VP5/WA0VQR	1030	90	93K
N1JEB	359	68	24K
WS1E	183	68	12K

NOTE: *Immediately following each RTTY contest, Ron AB5KD, and Jay WS7I, will collect high claimed scores. Ron will be on 7088 kHz and Jay on 14088, RTTY.*

Thanks to all that sent in your scores.

Scores may also be sent to AB5KD via:

E-Mail: ron481@austin.relay.ucm.org

Packet: AB5KD@N5LJF.#AUS.USA.NA

U.S. Mail: Ron Stailey AB5KD
504 Dove Haven Dr.
Round Rock TX 78664

-+- Hint of the Month -+-

WHERE IS RF GROUND?

RF ground at a ham station is one of those weird, intangible, witchcrafty things that elude even those who claim to know - absolutely - exactly where it is. For hams, RF grounding is a rather obscure and not well known subject, and should get much more attention than it does. One big reason: keeping RFI/TVI to a minimum. It is mandatory to have an excellent RF ground in order to establish a low impedance ground path for low pass filters, shielded boxes, etc., keeping those unwanted interfering signals from radiating.

Loosely defined, the best RF ground at a ham station is that point over the surface of the soil where the impedance from the RF source (transmitter) is lowest to earth.

Ideally, the best RF ground would be right at the transmitter itself. Trying to simulate this, I found a way that works very well for me. Some years back I installed a copper-plated 8 foot ground rod in the crawl space right under my station. Since the distance between the floor and the dirt was only 30 inches, I had to drive the ground rod in at an angle. That was not easy, kneeling in the dirt, crouched over, pounding with a small sledge hammer, etc.. If I had it to do over, I would have cut the rod in half and driven both pieces into the ground at an angle - a grounded inverted vee?! I drilled a 5/8 inch hole through the floor next to the back wall of the shack, and ran a 6 foot piece of 3-wire #10 Romex cable from the end of the rod to the final amp ground post. I joined the wires together only at each end. The 3 wires in parallel cuts the inductive impedance by a third, making the RF ground lead length to be the equivalent of a single #10 wire about 2 feet long.

My antenna tower is about 80 feet from the ground rod under my station. At the base of the tower I have 3 - 8 foot ground rods, mainly for lightning protection. So I have 2 RF grounds. But they are really paralleled paths for RF to ground. The 5 coax feedlines that leave the station and travel below ground through a 5 inch PVC pipe to the tower base, in effect, tie the grounds together because the coax shields are connected (grounded) at both ends. The fact that the shields of the coax feedlines are under ground for about 65 feet also helps increase the capacity (decreasing the impedance) to ground.

If you are having RFI/TVI problems, or RF getting into your computer, look into your grounding setup. You'd be surprised at how a few clipleads placed at questionable spots can make things work (or NOT work!). Be sure to check on all bands. I had a strange happening that occured only on 40M. The computer keyboard would lock up when using contesting software buffers, but was OK otherwise. The only way I could turn off the transmitter carrier was to turn off (warm boot) the computer. A cliplead from a keyboard bottom cover screw to the shack grounding buss solved it for the contest. I replaced it later with a piece of 2 conductor zip cord. A-a-h clipleads... the tinkerer's bandaid!

((73))... See you in the pileups,

de Rich, N6GG ■

P.S.

Drop me a line with an idea to share,
Or, drop me a line with an item to air.
Drop me a line with anger to bare...
But don't drop ME... 'cause I care!

HARDWARE

Jay Townsend, WS7I
P.O. BOX 644
Spokane, WA 99210

Wow! Lots of interesting things have been happening to the RDJ in the last month or so. Mike, KI7FX, had a family emergency and has asked that I fill in for him this month. Hmm, I just got out from under having to do all these columns, and already here I am back in the saddle. Sigh.

MailBag

Mike had been working with a couple of our manufacturers to help resolve a problem that Ron, W7KSK, had been having with his PK-900 and a couple of different types of Host Mode software. Rich, had been experiencing quite a lot of character overrun while using the program doing Baudot.

When I tested the PK-900 I had n't run into this problem. With some research and some comments in Jim's column last month I must note that we haven't solved this one yet. I suspect that a serial card might need to be installed or that some RF is getting back into the system somehow.

With the complexity of software, hardware, and computer serial ports nothing is getting any easier in the world of digital radio. I will keep trying to resolve the above problem and will let Mike report on it in a future article.

E-Mail

This month I would like to give you a helping hand on how to get from one E-mail service to another. This should explain the way to communicate between MCI or CompuServe and Internet.

Mail to CompuServe

Internet users can exchange mail with subscribers of the CompuServe system. There is a mail gateway between the Internet and CompuServe. To send mail to a CompuServe user, you must first know that person's CompuServe ID. CompuServe ID's consist of two numbers. The first is a five-digit number starting with a number 7. The second number can have up to four digits. CompuServe users write these numerals separated with a comma. The number 71573,1077 is an example of a CompuServe ID. To send mail to this user, from the Internet you would do the following: Address it by replacing the comma with a period and then you would add "@compuserve.com" to the e-mail message that you were going to send. The format would be like this 71573.1077@compuserve.com. A CompuServe user can send mail to an Internet user by using the normal Internet address with INTERNET: appended to the front. For example, to reach me as WS7I: you would send to the following: INTERNET:jayt@comtch.iea.com

Mailing to MCIMail

Any MCImail users can be reached if you know the 7-digit number of the user. (This number is often written like a US telephone number, with the first three digits separated from the last four by a hyphen.) You would simply append "@mcimail.com" to the ID number to form the address. For example to send MCI Mail to Danny, K7SS his address is 572-0561. All of the following addresses are equivalent and will identify that MCI account:

572-0561@mcimail.com
5720561@mcimail.com
005720561@mcimail.com

The MCIMail user can address mail to an Internet user by entering "internet" at the EMS prompt and entering your USENET address at the MBX prompt. jayt@comtch.iea.com will reach the ADRS Vice President)

Jim, WB7AVD

The remainder of this month's column will be a discussion of some mod's for a couple of TU's (terminal units) that work with the Yaesu FT-1000. Jim, WB7AVD is the EWARG technician and has worked in the digital world for many years as the owner of Inland Communications, the local Motorola Radio shop. He has been contesting with Hal and I for several years and has just recently completed the first stage of development of his own contest station. You will find his first love to be big amplifiers and his second is digital contesting. Without Jim many of my projects would be much more difficult. He has just put in a great effort in the ARRL RTTY Roundup.

FT-1000 and RTTY

This all started when I was on the air talking with Mike, K7DSR, on RTTY one night, using my Yaesu FT-1000D, and the Hal ST-6000. Mike said that when I started my transmission, the first few characters that I was sending were garbled. Well this was a real peculiar phenomenon, so I set out to see what the trouble was. After talking to Hal, WA7EGA, he suggested that the terminal unit was not starting in mark. This caused the receiving station to receive garbage for the first few characters that were sent. If I started the line of text with a few space characters, or didn't use the type ahead buffer all was fine. But, when using the type ahead buffer, the ST-6000 wasn't going into mark when it was put into the transmit mode. Thus garbage for the first few characters.

To make the Hal ST-6000 go into transmit mode immediately when the keyboard is typed on, or when you send the type ahead buffer or any other buffer, you must modify the ST-6000 so the keyboard operated send (kos) line puts the ST-6000 into transmit, thereby putting it into a mark state BEFORE the transmit data is sent. This sets the receiving station to mark condition so it is ready to receive data. The kos circuit as it exists, will not activate with a active HI on the kos line.

The schematic says the you can put a lo on this line and activate the kos line. Well, after careful study, I found that the circuit as depicted in the schematic will not work as drawn. You can't bring the input of a inverter low through a 10k ohm resistor when the input of this inverter is being driven with the output of an inverter. As you can see in the schematic of the ST-6000 this circuit can not work. the modification consists of 2 diodes (1N914 or equiv). One in between pin 13 of IC 6 and pin 3 of IC 8. The cathode is toward IC 8 pin 3. You must cut a run on the circuit board to install this diode. Then you must add another diode from IC 8 pin 3, to the kos line that appears on J3 pin 9. (J3 is the accessory plug on the back of the ST-6000). The cathode of this diode needs to be toward IC 8 pin 3. Next you need to remove, (or cut one side of it) the 10 k ohm resistor that is between IC 8 pin 5 and the kos line (J3 pin 9), (the .01 uF cap needs to stay). and you need add a 10k ohm resistor from the KOS line to ground for a pull down. Then the RQS line (request to send) pin 4 on a db-25 connector or pin 7 on a db-9 connector, is connected to pin 3 of the accessory connector. When you transmit with your communications program, i.e., "DS-RTTY" the RTS line will go high and put the ST-6000 into transmit

mode. Mike, K7DSR, uses this mod to run the ST-6000 on the commodore C-64 with the old "MBA-TOR".

I also use the MIL-188C output to input decoded receive data into the PK-232 external input. This gives the receive quality of the ST-6000 and satisfies PK-232 operating firmware and allows me to use the PK-232 to operate my logging software i.e. SCOTCHLG and RTTY BY WF1B.

You should be sure to use 2 each general purpose diodes in series, or a 4.8 to 5.1 volt zener diode to ground through a 2.2K ohm resistor to hold the voltage that you input to the PK-232 to approximately 5 volts. Also be sure that you change JP-4 in the PK-232 to the "A" position so the external data that you input to the PK-232 is routed to the proper place in the PK-232 . Also you input the external data to J-8 pin 1. This is the jack that is labeled "external modem". You can also use the MIL-188C output to key the FSK input to your rig. My friend Willie Mays, WA7PQU, uses this method to toggle the FSK input of his new FT-1000D as well. It is probably a good idea to put a diode in line with the MIL-188 line to prevent the negative going voltage from getting to the device that you are inputing the voltage to.

I hope that this helps in making ST-6000 modifications. I can be reached at home at (509) 466-6972 or on packet address WB7AVD@WS7I.WA.USA

73, de Jay, Ws7i ■

Got A Question?

Write to 911 for help. Maybe you don't understand something about your software or hardware. Maybe you want some particular knowledge about one of our many digital modes. Maybe you are looking for information on an older piece of gear. Send your questions to the Editor for quick publication.

Got An Answer?

So you ran into trouble a while back but you found a solution. That's great.. congratulations! But, how about the rest of us poor souls? What if we run into the same problem? What do we do? We could sure use your solution. How about sharing your fix with all of us. Send your answers to the Editor for quick publication.

911

You Can Help

(We get letters! And sometimes we find no easy answer to the questions asked. However, we know that somewhere among the RDJ readership there is at least one person able to answer almost any question that comes along. This month' s puzzler is from Solo, JA1SJV,. If you can help. please feel free to contact him directly, but please let the RDJ readers know as well..Ed)

I used to use a KAM-Plus and Hostmaster II terminal software. However, KAM-PLUS' demodulation of RTTY was not sufficient (although all other features/functions are very nice). So. I bought a Japanese TNC (TASCO TNC-231) in addition, to the KAM-Plus for RTTY. Are there any recommendable terminal software packages for this piece of gear?

All my computers are IBM compatible and I have difficulty finding suitable terminal software in Japan. Tentatively, I am using PacComm software for his but it is not as functional as Hostmaster I. If past RTTY Journals introduced this terminal software, I would like to get back issues or any other information. Can someone help me please!

de Solo, JA1SJV

Got A Digital Problem?

Write to 911 for help. Chances are, there is someone out in readerland who has an answer or solution to your problem. Send your problem to the Editor for quick publication.

Annual RTTY Dinner

Radisson Hotel - Dayton, OH

Regency Room

Saturday April 30, 1994

Buffet Dinner

Salad Bar
Fresh Vegetable tray
Au Gratin Potatoes
Mixed Vegetables
Tips of Beef in Bordelaise Sauce
Breast of Chicken Marsala
Seafood Newburg
Assorted Breads
Dessert Table

No-host bar from 1800 to 1900

Dinner promptly at 1900

Tickets $23.00 person

Tickets must be ordered in advance. This is necessary to meet Hotel requirements. Please make your plans now to attend this Gala affair where you will have a great evening with your digital friends. Following dinner there will be a short program.

Order your tickets from our Dinner Host, Steve Waterman, K4CJX.

Make checks payable to:

Steve Waterman, K4CJX
5828 Beauregard
Nashville, TN 37215
Phone: (615) 665-0952
FAX (615) 320-6144

NAVTEX Broadcasts

NAVTEX broadcasts are transmitted at regular schedules from designated points throughout the USA. In addition, NAVAREA broadcasts are transmitted from designated points throughout the world. These Narrow Band Direct Printing (NBDP) broadcasts can be received by many Ham controllers and other stand-alone devices that are available. Most of the manuals that come with present Controllers list some of the frequencies and pertinent data regarding NAVTEX. To help provide you with a bit more knowledge on this mode of transmission, the following information has been compiled from books and literature available from Alden Electronics Inc., Westborough, MA 01581.

Technical Description

Transmission Mode

NAVTEX messages are transmitted using Forward Error Correction (FEC) mode for narrow band direct-printing telegraph as specified in CCIR Recommendations 476-3. In order for the FEC mode to minimize character error at reception, each character in the message is transmitted twice.

The transmission of a character is followed by four other characters, after which the first character is transmitted again. By this double transmission of message characters the receiver is able to identify correct characters or error characters.

Transmission sped is 100 Baud (100 bits per second) but the real speed becomes half that rate because characters are sent twice. One character is composed of 7 bits as specified in CCIR Recommendations 476-3 ANNEX I 1982. (See figure below) Frequency shift keying (FSK) is used for Navtex transmissions. An RF signal transmitted at a frequency of 518 kHz and the frequency is shifted to indicate a Mark or Space. The frequency shift for Navtex broadcast is +/- 85 Hz from the center frequency. The Mark frequency (binary 1) is 517.915 kHz, and the Space frequency (binary 0) is 518.085 Hz. The RF signal is then received, demodulated, and processed by the Controller.

Transmitting Schedule

Transmission schedules take into account the relative geographical location of all NAVTEX stations within range, ensuring the least possible interference between transmitting stations.

Shown below is the transmission schedule for NAVAREA IV, XII. These two areas would be of interest to the amateur radio listener. However, since these stations all broadcast on such a low frequency, stations located inland from the coast lines of the US will not hear them. Each station has a 10 minute transmission time allocated in every 4 hours. To permit the immediate broadcast of vital information, e.g. Search and Rescue information, the frequency may remain unused at certail periods.

NAVAREA IV

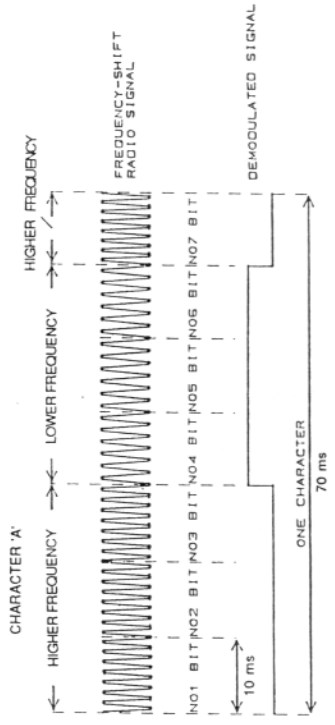
USA	Code	Broadcasts times GMT
Boston	F	0445, 0845, 1245, 1645, 2045, 0045
Miami	A	0000, 0400, 0800, 1200, 1600, 2000
Portsmouth	N	0130, 0530, 0930, 1330, 1730, 2130
New Orleans	G	0300, 0700, 1100, 1500, 1900, 2300
San Jaun, P.R.R		0200, 0600, 1000, 1400, 1800, 2200

NAVAREA XII

San Francisco	C	0400, 0800, 1200, 1600, 2000, 0000
Astoria	W	0130, 0530, 0930, 1330, 1730, 2130
Long Beach	Q	0445, 0845, 1245, 1645, 2045, 0045
Kodiak	J	0300, 0700, 1100, 1500, 1900, 2300
Honolulu	O	0040, 0440, 0840, 1240, 1640, 2040
Adak	X	2340, 0340, 0740, 1140, 1540, 1940

The map below shows locations of those stations now operational. If you would like more information on NAVTEX transmissions worldwide, Alden Electronics has an excellent guide available for $6.00. Contact them at 40 Washington St., Westborough, MA 01581 (508) 366-8851 FAX (508) 898-2427

A special thanks goes to C. Brown, N4SO, for submitting this information.



NAVTEX Signal (Letter A)

NAVTEX Station Allocation, North America

DATA COMPRESSION

Introduction

New technologies swept through the HF digital bands in the past few years and our modes will never be the same again. The availability of sophisticated hardware opened the way to faster throughput. Clover and Pactor, combined with inventive software products gave us features not even dreamed about a few years ago. Who could imagine, even as late as 1990, routine transmissions of digitized pictures in full color, the exchange of huge binary files and, yes, play with digital voice transmissions on HF that takes place now? These advances came about because of new technology but also because of advances made in two key areas--Data Compression and Error Correction.

Data Compression Part I

Most of you have heard of data compression and I am sure many of you use it every day. Even so, applications that apply compression mystify us and seem to employ witchcraft to accomplish an impossible task. The following is an overview of the different methods used and how they are applied in amateur radio.

Let's start with a discussion of the advantages that data compression gives us, then look at the commonly used technologies and examples of their performance. Error correction will be discussed in a later article as a separate subject.

So what is data compression? In short it is a way to reduce the size or amount of data contained in a file without losing the information contained in it. Interestingly this is nothing new to amateur radio. Compression has been in use since the very beginning of wireless communication. All of our "Q" codes are nothing less than an elegant way to reduce the amount of data to be transmitted! Morse code itself is an early example of data compression. By assigning short sequences of dots and or dashes to the most frequently used letters in the alphabet, the size of the data shrinks appreciable. So we digital amateurs are really late-comers in the application of this technology. Our CW friends further down the band use it all the time, though few of them are aware of that. But the effect is clear. In reducing the size of the data, more information moves on the path in a given time unit--an advantage we should use to the maximum extent possible.

Lossy and Lossless

"Q" codes and CW, those early examples of compression, serve to illustrate the two basic ways of compacting data. Lossless compression keeps the information absolutely intact, removing nothing from nor adding to the information contained in the original data. Morse code is the perfect example. The chain of characters converts to a series of signals that are reconverted into EXACTLY the same chain at the receiving end maintaining perfect data integrity. Lossy compression, on the other hand, passes the essence of the information required under the circumstances, but does not keep the information intact. Sending the abbreviation "QSL" over a radio link passes the message, "Can you acknowledge receipt," or "I acknowledge receipt." But no exact wording of the message can be determined. Many shades of meaning are possible and its interpretation relies heavily on the circumstances in which the phrase is used. Dozens of such phrases are used in conversations and messages by all of us.

Both methods of compression have advantages. Lossy compression delivers a much higher compression ratio (usually expressed as a percentage reduction of the original data). Using the Lossy "Q" code an entire sentence can be reduced to a mere three characters. Lossless compress is much less effective but allows the data to move unharmed, not subject to misinterpretation at the receiving end of the transmission. The choice depends entirely on circumstances and the data to be transmitted.

Compression in Amateur Radio

You may wonder why data compression didn't make it in good old RTTY or Amtor. Of, yes, the "Q" codes are used but why is there no compacting of the data itself? Why didn't Baudot, who assigned five bits to express one character, use codes of variable length like Mr. Morse? The answer lies in the way the information is treated. We hear Morse with the human ear or read it manually from a tape printed by the receiver. Our brain reads the messages even when bits of data are missing. The mechanical machines used in the early days of teletype and even today's computers have trouble doing the same task. There are two main reasons for this phenomena. First, our brain easily fills the gaps left by garbled or missing signals by examining the sense of the information transmitted. No computer or mechanical machine has or is likely to acquire that incredible skill. Secondly, while machines of all kinds can read characters of the same length but with ^-variable patterns^- even today's computers fail to receive 100 percent of the data sent with characters of ^-variable lengths^-. Copying CW with your PK-232 proves the point. Thus we conclude that Lossless compression using variable length codes is difficult to implement.

Compression and Digital Transmissions

The solution is simple. We must compress our data before we transmit it and then pass it over our link using symbols of equal length to represent the data. And that is the way it works. A string of equal length characters is replaced by another, shorter string of characters that contains the same information. The shorter message passes over the connection and converts to the original form after reception. Wait a minute! If it is that easy, why don't we do the same thing for RTTY and Amtor? Why all the expensive alternatives? Both modes meet the symbol criterion after all. Yes, but there is another problem. Compressing and uncompressing data requires something neither mode delivers. The compressed data must be received 100% error-free or the decompression will produce garbled data. No guesses are made by the computer at the other end, since no guess can be made by the machine (at least at this point in time) and the intelligence in the original data is lost. Unfortunately RTTY is far from being error free and even Amtor, an error-correcting mode, in not 100% free. Compressed data must be as pure as the driven snow, complete, without error of any kind. Until recently, only packet offered the required data integrity. Yet it is not suitable for use at HF. In UHF/VHF packet compression has been

successfully deployed for some years. So, I hope you understand why we had to wait for Clover and Pactor to arrive before our HF doors opened up to faster data exchange.

Lossless Compression Techniques

There are several available methods of compression, and all are in use today. Each, whatever the design, takes a stream of symbols, translates them into a shorter stream of symbols, then retranslates back to the original stream at the receiving end. This coding and decoding of data is a common element in every aspect of communication.

Huffman Coding accomplishes this by checking for the probability of characters and assigning variable length strings to these characters. Huffman assigns short three bit codes to common letters like A and E, but eleven bits to Q and Y. Initially the relationship between characters is kept in fixed tables. This approach works well in plain English text but may create problems in a foreign language where the character probabilities vary widely. And in non-text materials the fixed table may actually increase the size of the file.

Huffman code is implemented in Pactor controllers. A fixed table is integrated in the control program so that normal text can move 20 to 30 percent faster than normal. The gain in speed relies largely on the accuracy of the table used to code the characters.

A slightly higher level of compression can be achieved, perhaps up to 40 percent, by applying statistics directly to the file undergoing compression. This technique builds an accurate code table for the specific file but must be completed before transmission and cannot be done "on line," or on the air during the exchange. The efficiency is reduced, however, because the transmission must include the code table along with the file itself. Otherwise the decoding can't take place. This method is practical only for large files that are pre-stored for transmission.

Adaptive Huffman Coding utilizes variable tables that are constantly updated by the statistics from the file being transmitted. Special control sequences inform the receiving station of the changes that are made on the fly. This process produces greater accuracy and therefore creates more efficient compression. The other benefit is the ability to apply the compression method while on the air.

A quite similar system, a variant on Huffman, is the so-called 'Arithmetic Coding.' Instead of using fixed length codes this system uses variable length codes. So, instead of using a three bit code for the letter E, it may be assigned a value of 1.26. This makes the tables more accurate, but fractional bits cannot be transmitted. Thus the calculation process goes on until the entire message translates into a single code! This intensive calculation involves highly complicated formulae and the coding is slow even on today's fast PC's. On larger text files, Arithmetic coding achieves 60% or better compression. It is now being used in my Express software for Clover.

Dictionary Coding is yet another approach and is built on the concept of replacing commonly used words with numbers. On the surface, this seems a logical approach. However, the limits to the design restrict compression to about ten to fifteen percent. Most frequently used words are short words, shorter than the numbers that might replace them, so they can't be used. Second, the dictionary must be limited in size or the numbers used to replace the words become too long, larger in code than the replaced word. Third, the receiver on the other end of the exchange needs to know that a number arriving is code and not an ordinary number. This requires an 'escape code' which adds to the volume of the file being transmitted. Our 'Q' codes are an example. The Q is the escape code and the other two characters are from the dictionary. To top it all off, the word must be spelled correctly or it will not encode and must even be in proper case. No 'all caps' word encodes if the dictionary sees the word only in lower case. This is an inefficient approach unless we have special data with lots of repetition and a carefully constructed dictionary.

LZW Coding, an invention of Jacob Ziv and Abraham Lempel (and improved by Terry Welch) evolves from the dictionary concept. No dictionary is present at the beginning of the transmission, but the characters are placed in a buffer, or 'window' that represents a dictionary. This is performed at both ends of the link. Whenever strings of characters reappear, only the offset and length (that is, the location) in the buffer are transmitted instead of the characters themselves. The buffer is of limited size, of course. Once filled the oldest un-repeated characters move out at the top to make space for the new ones coming in at the bottom. Hence the expression 'sliding window' compression. Interestingly, a small two KB buffer allows many repetitions and very good compression--typically 40 to 70 percent!

Most popular compression packages we find on today's computers relay on LZW. PC-ARC, PKZIP and Yoshi in the DOS world, Compress in Unix, GIF and TIF graphic formats, MS-DOS 6.0 Doublespace and others. Phone modems using V42bis use the same technique. In the amateur world the method found early use in packet's FBB, for example, and then later on HF. Express 2.03 uses a variety of LZW and achieves very satisfactory results under all band conditions.

There are many ways to achieve lossless compression of data, each having its own distinct features and advantages. In many applications, several methods combine to allow for optimum performance. Compression has found a friendly reception in the amateur world and its use is expanding at a steady pace. Whether keyboard-to-keyboard or BBS -to-BBS compression has a place in your system. So jump in and learn how best to apply it to your digital application.

Next month we will look at the other side of the coin and examine Lossy compression. Startling ratios are achieved in this rapidly changing field.

de **Peter Schulze, TY1PS** ■

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MICROCOMPUTACION

Esta revista se publica bimestralmente y en una de las páginas iniciales se indica cómo subscribirse. El precio de la subscripción, seis ejemplares anuales que incluyen la **GUIA DE EQUIPOS y ACCESORIOS** (edición de Noviembre/Diciembre), en sobre cerrado, por vía aérea al domicilio del lector, es de US$40.00 para todos los países con exclusión de México y Canadá. En razón de las más bajas tarifas postales, para los dos últimos la subscripción anual cuesta US$20.00. Para los Estados Unidos y Puerto Rico el precio de la subscripción anual es de US$18.00. Los pagos deben hacerse en moneda norteamericana mediante cheque de cuenta bancaria en los Estados Unidos, cheques de viajero, giro postal u orden de pago internacional a nombre de:

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1) Aim: It's a world wide competition: everybody can work everybody.

2) Date and time: Every first full weekend of May from 2000z Saturday till 2000z Sunday. In 1994 it will be on May 7/8.

3) Classes

1) Single Operator - CW

2) Single Operator - SSB

3) Single Operator - Mixed

4) Single Operator - RTTY

5) Multi Operators - Single TX - Mixed

6) SWL - Single Operator - Mixed

4) Bands: 10m thru 160m (except WARC bands) are allowed according to IARU Band Plans. Band and mode can be changed only after 10 minutes you have been on it. The 10 minutes' count starts from the first QSO made on that band.

5) Exchange: Italian stations will send RST + two letters to identify their province. Other stations will send RST + a serial number from 001.

6) QSO/Points:

- a) QSO/HRD with own country counts 0 point but is good for the multipliers' credit.
- b) QSO/HRD with own continent counts 1 point,
- c) QSO/HRD with different continent counts 3 points,
- d) QSO/HRD with any Italian (I & IS0) station counts 10 points.

The same station can be contacted on the same band once on SSB, once on CW and once on RTTY but only the first QSO is good for multipliers' credit.

7) Multipliers:

- a) all Italian provinces (103) count 1 multiplier,
- b) all DXCC countries (except I & IS0) count 1 multiplier. The same multiplier (country/province) can be counted once for band.

The 103 Italian provinces are:

I1: AL, AT, BI, CN, GE, IM, NO, SP, SV, TO, VB, VC. IX1: AO. I2: BG, BS, CO, CR, LE, LO, MI, MN, PV, SO, VA. I3: BL, PD, RO, TV, VE, VR, VI. IN3: BZ, TN. IV3: GO, PN, TS, UD. I4: BO, FE, FO, MO, PR, PC, RA, RE, RN. I5: AR, FI, GR, LI, LU, MS, PI, PO, PT, SI. I6: AN AP, AQ, CH, MC, PS, PE, TE. I7: BA, R, FG, LE, MT, TA. I8: AV, BN, CB, CE, CZ, CS, IS, KR, NA, PZ, RC, SA, VV. I0: FR, LT, PG, RI, ROMA (or RM), TR, VT. IS0: CA, NU, SS, OR. IT9: CL, CT, EN, ME, PA, RG, SR, TP, AG.

8) Final score: The sum of QSO/points from all bands times the sum of multipliersfrom all bands.

9) SWL: SWLs have the same rules of OM. The same station cannot appear more than 3 times on every band as a correspondent.

10) Logs and summary sheet: Logs must contain no more than 50 QSO on each page, separate logs are necessary for each band. Logs must show all the QSOs' data (date, GMT, callsign, complete sent and received exchanges, new multipliers and points). Duplicate contacts must be enclosed in the log, marked and with points = 0.

A summary sheet is required showing all the scoring details on each band, class of entry, name, callsign, full address of the applicant, callsign of other operators and a signed declaration.

A dupe sheet is required for entries with more than 100 QSO on one band. Computerized logs on diskette are welcome only in ARI Contest format. You can apply for free software to the Contest Manager.

Logs must be mailed within 30 days from the end of the contest and addressed to:

ARI Contest Manager, I2UIY Paolo Cortese, P. O. Box 14, 27043 Broni (PV) Italy.

Please enclose your station's description and your comments. A picture will be much appreciated.

11) Penalties and disqualification:

Disqualification applies for :

a) excessive number of unmarked duplicates (more than 2%),

b) excessive declared score (more than 10%),

c) violation of the "10 minutes rule",

d) log without the summary sheet.

e) log not according to these rules.

Penalties :

f) will be removed from the log:

- - unmarked dupe QSOs,
- - multipliers claimed twice or more,
- - wrong multipliers,
- - false, not existing or unverificable callsigns,

g) a declared score higher (between 0,1% and 9.99%) than the real score will bring a penalty of 5 to 1 (1000 points declared in excess more means a penalty of: 1000 + 5000 = 6000 points).

Decisions of the Contest Committee will be final.

12) Awards: A plaque with a certificate will be awarded to the top scoring station in each class. Special Plaques can be awarded by the Contest Committee if country/continental/call-area partecipation justify the decision.

A FREE pocket calculator will be awarded to each station who will work:

100 Italian stations (for DX)

250 Italian stations (for Europeans)

A certificate will be awarded to No. 2,3,4,5 top scoring stations in each class as well as to the top scoring stations in each country in each class.

Contest rules submitted by:

Paolo Cortese, 12UIY, N7PMC, K8AFL

ARI HF Contest Manager

PTCplus

The new PACTOR Hardware Based on the 68000

by Dr. Tom Rink, DL2FAK

The PACTOR-Controller (PTC), developed and distributed by the creators of PACTOR, SCS in Germany, has now been available for about three years. In this time it has entered many shacks all around the world because of its highly efficient and inexpensive design based on the well-known Z80 microprocessor. The PTC played the major part in making PACTOR the new standard of Radio Teletyping and data transmission on shortwave. Unfortunately, one of the most important chips inside the PTC, the Z80-STI, is not produced any more. Therefore, SCS decided to develop new hardware for PACTOR. This new unit, which is called 'PTCplus', is described below.

The Processor section

The processor is based on the 68000 and compatible peripheries. A 68EC000 operated in 8-Bit mode and clocked with 14.7456 MHz together with the serial timer interface (STI) 68HC901 constitutes the heart of the 'PTCplus'. A 27C512 CMOS-EPROM containes the firmware and provides enough free space for future extensions. Various RAM sizes are possible varying from 32 to 256 kBytes, depending on the kind and number of chips used. Two 32-pin DIL sockets are provided, only one of which is used in case of the smallest possible RAM size. The 'PTCplus' automatically detects the RAM size during the power-up procedure, thus there is no need for any additional configuration by the user. Two 16V8 type GALs are used for the address decoding and clock recovery of the STI. Like the previous PTC, the PTCplus also provides a real time clock. Processor supervising, watchdog function and backup-battery power management of the lithium-cell are done with a MAX691A chip. As interface to the host computer a MAX232 is used. All I/Os are filtered by EMI supressor filters to decrease electromagnetic interference with the receiver as well as susceptibility against electromagnetic fields, produced by all radio transmitting equipment. If the computer serial interface chip should become damaged, it can easily be exchanged as it is inserted in a socket. Instead of the 25-pin SUB-D connector, the smaller 9-pin female version is now used. This provides additional space for some useful access-panels on the rear side of the PTCplus. There are no jumpers required inside the PTCplus any more. The baudrate to the terminal is now set with a digital code switch on the rear panel. Baudrates from 300 to 38400 Baud are possible. The rear panel is printed, so there will no longer be any doubt about the correct adjustment.

The Analog section

The analog input, filter and demodulator section is, in its major parts adopted from the previous PTC because it has proven to work very well. In comparison with an ideal FSK demodulator programmed on a DSP, the conventional hardware of the previous PTC shows no significant difference when working on the air. For this reason an expensive DSP has not been used in the PTCplus. The German PACTOR development group is going to use a DSP only in the PTC-II, as in this case the chip is required to handle the PSK modulation of the PACTOR-II signal. There are however, still some improvements in the demodulator section of the PTCplus that have been made. The seventh order switched capacitor filter has been replaced by an eighth order type that provides an additional free OP-AMP, which has been used as a limiter circuit in front of the discriminator filters. One OP of the TLC274 thus became free to form an additional high pass to the receiver section. These modifications enable a better in-channel selection of the PACTOR signal, especially if a wide SSB filter is used instead of a well chosen CW-filter in the receiver IF- path. The PTCplus has an electronic High- / Low-Tone switch controlled by software, which has been realized with the aid of two trimmer-sets switched with MOS-FETs. Re-alignment is thus no longer required when changing between High- and Low-Tones. The analog part connects to the digital side using an 8- bit A/D-converter, which is essential for the high performance of the analog Memory-ARQ system.

Unlike the receiving side, the transmitting and AFSK tone generating sections of the PTCplus have been considerably changed. The rectangular AFSK tones generated by the STI are now filtered by the eighth order switched capacitor low pass filter, which had initially only been used in the RX section. The result is a pure sinuosoidal AFSK-signal without any harmonics. The output level for the transceiver is adjusted with a potentiometer accessable from the rear panel.

The RX-section of the PTCplus is muted by the MOS-FET Q2 while transmitting in order to prevent any receiver noise from being fed through and transmitted as well. It is probable that not many transceivers are absolutely silent on their AF-output while transmitting. When using a separate receiver and transmitter the muting is essential and has to be done anyway.

FSK operation is of course also further supported. The FSK as well as the AFSK outputs are connected directly to the 8-pin radio connector, hence both are simultaneously available. There is thus no switching or jumpering now required when changing between FSK and AFSK modes. The connections of the radio-connector have been choosen in such a way that the most important pins have the same location as they already occupied in the previous PTC. In most cases the existing cable between the original PTC and transceiver can be used for the PTCplus without any re-wiring. All pins of this connector are filtered with EMI suppressor filters as well.

Power Supply

The PTCplus is supplied with 8...15 V DC. The required current is about 200 mA, the same value as the previous PTC in spite of the more than doubled processor clock frequency. The supply voltage may be connected to the separate DC-connector at the rear panel, or fed into the transceiver-connector. This allows the PTCplus to be supplied from the transceiver with only one cable between transceiver and the unit itself, thus minimizing cabling and decreasing the chance of constructing groundloops. The power-input is also filtered inside the PTCplus. As already mentioned above, Realtime-clock, Logbook, Mailbox and the user defined settings are buffered by a lithium-cell, so data will not be lost on loss of power or switch-off.

Constructional Features

From outside, the PTCplus looks almost like the original PTC. The front-PCB carrying the LEDs has not been modified at all. The meaning of the LEDs has been only slightly changed. The PTCplus, however, looks very different from the rea r. The terminal-connector now is a 9-pin instead of the previous 25-pin SUB-D type. As connector to the transceiver, an 8-pin instead of a 5-pin DIN type is used. The rear panel carries a switch for the baudrate and a potentiometer to adjust the AFSK output level. Additionally the rear panel is now printed-on. Opening the case (which is only necessary to satisfy the curiosity) shows an absolutely new layout. Most of the components are surface mounted. Processor, STI and the GALs have a PLCC-package. Only the RAMs, the EPROM and the serial interface circuit MAX232 still have sockets to provide the capability of future hard- and software upgrades and of an easy exchange in case of a damaged chip. All transistors are MOS-FETs. The PTT line is switched by an especially robust type. The PCB carries a fine pitched layout and the solder side shows large ground-planes which identifies one of the ways to better electromagnetic compatibility. Assembling the unit by hand at home is no longer easily possible. Some of the SMD components are so small that 100 of them would fit into a thimble. It is for this reason that a kit for the PTCplus will not be made available.

The Firmware

The firmware of the PTCplus has been programmed by the inventor of PACTOR, DL6MAA, in a highly efficient 68000 assembler code. Besides PACTOR, the new unit of course still supports AMTOR, RTTY and -in addition to the CW- identification- full capability of CW transmitting and reception (decoding). The transmitting CW speed is adjustable in the range between 40 and 1200 cpm. When receiving, the software automatically detects the speed of the incoming CW signal and synchronizes with it. As another novelty, RTTY provides an adjustable software-squelch, thus random characters on the screen due to the receiver noise without any signal will not appear any more. Because of the increased processing power, PACTOR and AMTOR standby as well as AMTOR FEC and PACTOR LISTEN are simultaneously available, hence it is now possible to get connected in AMTOR while listening in PACTOR or receiving FEC in both modes. The PTCplus features a context-sensitive online-help, which provides a specific help-text in English language to each command, thus using the manual will normally not be required. Like the original PTC, the PTCplus also provides a logbook and a mailbox system. The size of the mailbox depends on the RAM extension and may be up to about 250 kByte. The quantity of files is only limited by the free memory space. The mailbox is accessable from the PACTOR as well as from the AMTOR side. In AMTOR a login procedure precedes the mailbox access because of the missing Call. The features of the box have been dramatically increased. The syntax now is similar to the well-known software 'DieBox'. There are sub-directories, global Read and Delete commands and a mail-announcer which tells the operator or the connecting station if there is a new message waiting to be read. A status-word is available on the serial port which allows intelligent terminals to request the status of the PTCplus and data about the current QSO or whether the channel is busy. The status-data and the operational syntax are compatible to the previous PTC, thus existing external software can work with it without any change. Additionally, the Connected state is hard-wired to the DCD-pin of the terminal connector so that terminal programmes can have access to it much earlier than they could have when only using the status-word. This is a major advantage, especially for scanning mailbox systems. Implementing a complete hostmode compatible to WA8DED is planned for future updates but is not available in the first release of the firmware.

Summary

Although the reason for developing a new PACTOR-Controller was due to the non availability of an important chip, the solution could not be a temporary one. Three years of experience with PACTOR and especially with the users has formed a new piece of equipment, designed to meet the requirements of the OMs all around the world. The PTCplus is a consequent further development including ideas not only from the PACTOR inventors themselves, but from many people whohave fun with radio-teletyping and data transmission on shortwaves. It is they who have always needed the best that is available and who therefore chose the original SCS-PTC, and now the PTCplus. With the new PTCplus many things have changed and improved, only one thing has remained nearly the same: The low price of the unit.

Source of supply: SCS - Special Communications Systems, Roentgenstr. 36, 63454 Hanau, Germany, Fax: +49 6181 23368

de **Tom Rink, DL2FAK**, 73

1994 ARRL CONFERENCE ON DIGITAL COMMUNICATIONS

First Announcement and Call For Papers

The 13th annual ARRL Digital Conference will be held in Minneapolis, MN on August 19-21, 1994, with the main formal program on Saturday August 20. The objective is to create a forum where amateurs and other experts in digital communication can meet, publish their latest work, and present new ideas and accomplishments for discussion. Presenters and attendees will have ample opportunity to exchange ideas and learn about recent hardware and software advances, experimental results, theories, and practical applications. Areas of interest include all aspects of generation, coding, modulation, transmission, networking, demodulation, processing, presentation, and application of voice, text, image, date, and other information.

Anyone interested in digital communications is invited to submit a paper for publication in the Conference Proceedings. Presentation of the paper at the Conference is not required for publication. All published authors will receive a complimentary copy of the Proceedings. The deadline for receipt of papers at ARRL Headquarters is June 20, 1994. Papers may be camera ready or electronic format and should be sent to Maty Weinberg, ARRL, 225 Main St, Newington, CT 06111, U.S.A. (Telephone (203) 666-1541, internet !weinberg@arrl.org, MCI Mail 215-5052)

The Conference will be hosted by the TwinsLAN Packet Radio Club and will provide alternate activities for spouses and family members. For further information regarding Conference registration, program, accommodations, etc. contact Paul Ramey, WG0G, 16266 Finland Ave., Rosemount, MN 55068. (Telephone (612) 432-1149 evenings and weekends).

THE LAST WORD

More help wanted: Last month's discussion about your ownership of the Journal produced some but not enough results. We need volunteers to extend their membership for a full three years, now. We need patriots to send gift subscriptions, now. More contributions are needed, now. Please fill out the special order form and pay your money and take your choice. Remember from last month, there are five ways to make a difference. 1) Extend your membership for a full three years and save a bundle doing it (rates go up June first), 2) give someone a gift membership, a wonderful way to help a newcomer get started in the digital world. Save more on your membership in the process, 3) sign up new members. Spread the word at the club or the hamfest, 4) support those who advertise and help get new ones. No publication reaches the digital community so efficiently and 5) contribute to the BOOTSTRAP fund. Get your cash out from under the mattress and put it to work where it will earn a handsome return. The bonuses for each level of giving are included in the membership form elsewhere in the RDJ. Thanks in advance.

One of the least celebrated attributes of the RDJ is its currency, or timeliness. My software column is put in the mail less than a month before you read it. Dale starts to assemble all of the pieces of the magazine shortly after the first of the month and mails it about the 20th. If any one of the columns were to run in any other amateur publication, it would run in the April not the February issue.

The subject of timeliness brings to mind the Classified section, the least appreciated of the Journal's assets. I don't know why that's true. If you advertise here, your used gear is sold before the ad would ever run anywhere else. If you need to sell some digital gear of any vintage or condition, where else will you find as many prospective digital buyers as you will here? It's a natural and we would appreciate your giving it a try. Clean out your closet and list the gear here. Let's make March "Clean Out The Shack" month. Thirty words for $7.50, plus ten cents for each additional word--it's a steal. Just send your ad and a check to the Fallbrook, CA address before the first of the month you wish the ad to run. I already have done so.

By the same token, timeliness allows us to be ahead of the pack when it comes to real news. Thus, the new column this month. Jim Jennings KE5HE switches to UPDATE, a space devoted to whatever is new in the digital world. No one I know could do a finer job of it. Regulatory news, ADRS bulletins, product announcements, people notices--whatever is genuine news. (No rumors allowed). Since Jim can be in only one place at a time it is obvious that he cannot cover the entire world's news beat. We all hear news from time to time. If you have any solid news to report, please send it to Jim promptly. He is easy to reach even when he is travelling. His CompuServe number is 71564,673. Help him help us make a better Journal.

Help wanted: One of the problems of a not-for-profit organization, and particularly one that publishes a magazine that accepts advertising, is the need for an auditable accounting system. The post office or the IRS have the right to audit our statements at any time, as they should. Mary Boyle does a lot of different things very well, but setting up and maintaining the accounting system is a bit outside her realm. We need an able volunteer who can make our chart of accounts appropriate to the need, then validate each month's

postings to a PC-based system. There are, quite naturally, forms to be filled out at certain times of the year. This need can best be described as urgent. Please get in touch with me without delay. (Warren is out of the country much of February).

Bob W1VXV called in response to last month's Help Wanted plea. His resume proved beyond a shadow of a doubt his database expertise. He offered and the ADRS accepted and will make good use of his talents. His first assignment involves the evaluation of the database module of the next ADRS software package that will appear in April. More assignments are in the works.

Crawford WA3ZKZ (and VP8CMY) volunteered to become our official agent in the state of Delaware (the state of ADRS incorporation). We need one and his efforts will save us future fees. His energies will be applied elsewhere soon.

What about you? We need your expertise. Right now we need a bulletin information manager for the packet network. The BBS in New York could use guidance and structure from a gifted land line sysop. We need a direct mail writer, someone with lots of knowledge about the post office, a friendly printer, a graphics specialist–you name it, we need it. Drop me a line and let me know what you can do to strengthen our operation.

The Journal thrives on crisp pictures (color or b@w) of stations and the people who run them . . . yours among them. Write up a short piece about your experience in the digital modes and send them to me. Maybe you can make the front cover.

Dayton is around the corner. While the weather to the north of us doesn't make it seem possible, spring is not far away. Until next month,

de **Jim, N2HOS** SK ■

NOTICE

As reported in the last issue, Irv Emig, W6GC, became a Silent Key December 21, 1993. The Don Wallace Radio Ranch Foundation has just announced the creation of The Irv Emig, W6GC, Memorial. After 62 active years in Ham radio this is a fitting tribute to Irv. The Memorial has been started with initial donations from friends of the Manhattan Beach Amateur Radio Club, from others wanting to do "something" and by his children's donation of the entire proceeds from the sale of his radio gear. Thus, this Memorial has grown to become the largest combined contribution to the Museum. Every contributor will be individually recognized, listed and carried on the ledger, as are all contributors.

The Don Wallace Radio Ranch Foundation Inc. is a recognized 501 (c) (3) non-profit corporation. Donations are tax deductible. If you wish to make a contribution, make your check payable to The Don Wallace Museum (notate Irv Emig Memorial) and send to Don Wallace Museum, 5746 Wildbriar Dr, Rancho Palos Vedes, CA 90274. For information call (310) 378-8029; or FAX (310) 378-3557

FACTS You Should Know About the ADRS

Dues go up June 1, 1994. However, you may extend your membership for one, two or three years at the current rate or even less. See below.

For all of you this is a very special offer indeed. The basic ADRS membership for US/Canada/Mexico rate increases to $20 on June 1, 1994. First class North America and foreign surface increases to $25. Foreign airmail to $35. These increases are required for a very good reason. The Journal evolves to twelve issues per year in 1995 and, according to current plans, to more pages as well. So the new rates must pay the postage as well as the anticipated increase in rates.!

However, loyalty earns a reward. Save by extending your current membership for two years at the present rate, then deduct $3 from the third year's rate. For example, if your current membership rate is $16, your total bill for three years is $45. That is a savings of $15 when compared to the new rates. But wait, if you extend your membership for three years and add a gift membership to anybody, anywhere at the current rates, you save $2 more! So, renew for three years for $43, send a gift membership at the current rates, and do the ADRS a great big favor. The same savings apply on all the other membership levels as well. Details below.

Membership Details

CURRENT RATE	ONE YEAR	TWO YEARS	THREE YEARS
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First 30 words $7.50, additional words 10 cents each. Cash with Ad. Deadline for ads is the 1st of month of publication..
(Example - Ad arrives by the 1st of September, will appear in the September issue.)

Manuals Wanted: CV-483/URA-17 FSK Converter, Digitech DT125-W2 Teledata Generator, TT-299 MITE teletypewriter, any books on foreign commercial RTTY equipment. Geoff Fors, WB6NVH, BOX 342, Monterey, CA 93942 (408) 373-7636

FOR SALE: HAL PCI-3000 and SPT-2 SPECTRA-TUNE. All cables, manual and W9CD's PTERM included. I ship second day air.. first $375. Jim Mortensen, N2HOS, (813) 596-3105 FAX (813) 596-7473

BACK ISSUES - All Back Issues of the Following: RTTY Digital Journal - ATVQ - A5 SPEC-COM & ATV TODAY. Write for list & prices - SASE - ESF Copy Service, 4011 Learview Dr., Cedar Falls, IA. 50613 (319) 266-7040

NEWS - NEWS - NEWS -- NEWS

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RS-232C and COM PORT booklet: This is a compilation of all articles published in past issues of the *RTTY Journal* on these two very important topics. If you are using a computer in conjunction with Ham Radio, you will find this booklet an invaluable tool to have in your shack. The booklet contains information about COM ports 1,2,3 and 4 as well as the RS-232C information. Send $5.00 to the ADRS, PO BOX 2465, New York, NY 11801 and you will receive a copy of this invaluable booklet by return mail, postage paid.

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This is the program used by WINNERS. RTTY by WF1B is the premier teletype contest software. Supports CQWW, ARRL, SARTG, BARTG contests. New DXpedition mode recently used by AH1A. Supports HAL PCI-3000, PK-232, KAM, MFJ-1278, UTU, AMT-1, and Standard TUs. Online features: Automatic duping, Automatic multiplier identification, Automatic scoring, Mouse support, Break-in buffer, Buffer tags for dynamic custom transmissions, File transfer. Post Contest features: Complete paperwork generation, QSL labels, Statistics. Call (401) 823-RTTY for fact sheet. IBM-PC, $41.95 (US/VE) $44.95 (DX). Specify disk size. Wyvern Technology, 35 Colvintown Road, Coventry, RI 02816-8509

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