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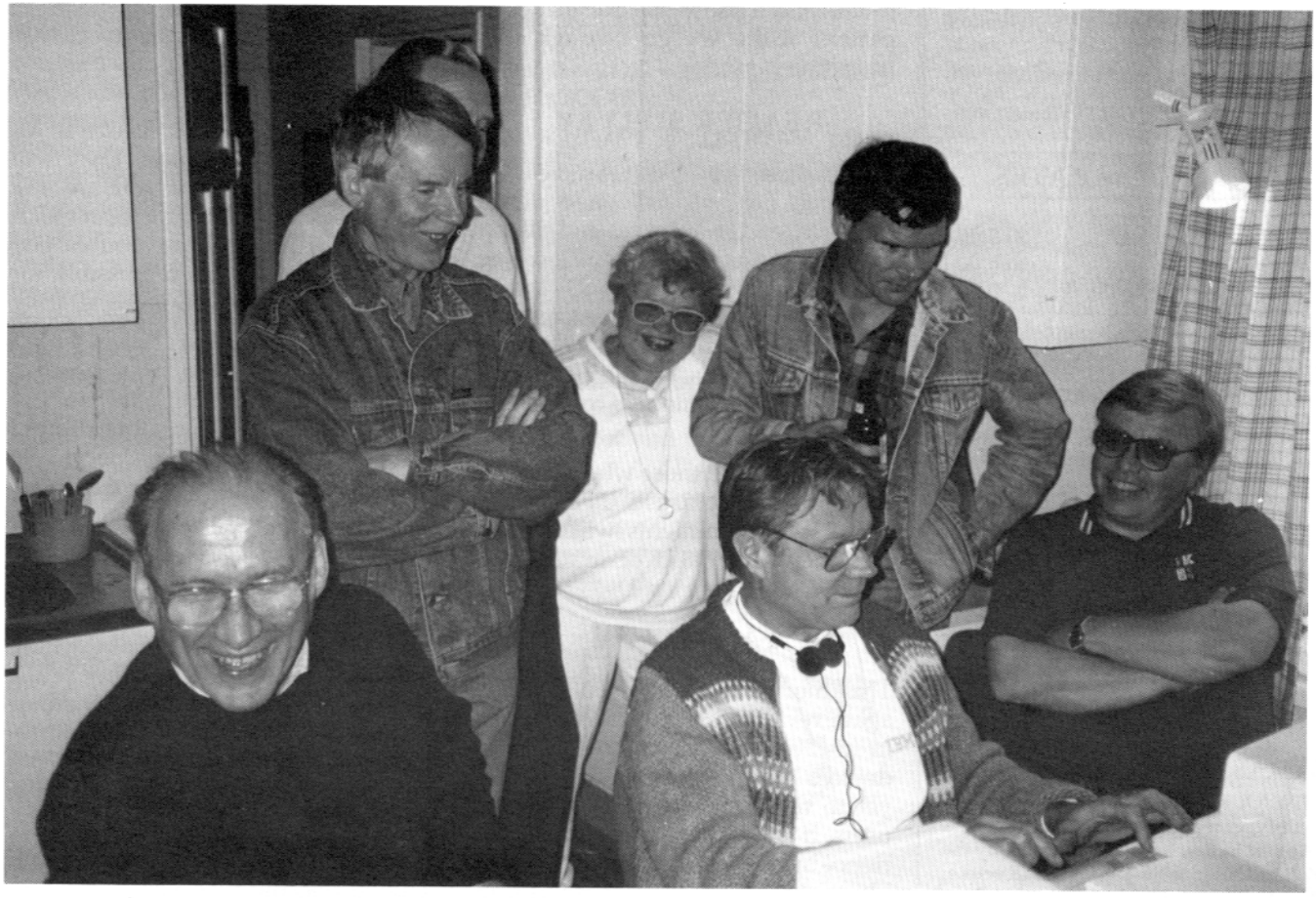
OH2AG Scores 557,775 Points in CQ/RJ RTTY Contest

Story page 20



OH2AG, IBM Ham club members operating during the 1992 CQ/RJ RTTY Contest, September 26-27. L. to R. seated: OH2GI, Jukka (author of contest program), OH2LU, Tapani, OH2LTR, Tapani, L. to R. standing: OH2SS, Martti, OH3DO, Alpo,, XYL/OH2LU, Kerttu, OH2JF, Martti. Picture by Timo, OH2HF.

RTTY DIGITAL JOURNAL

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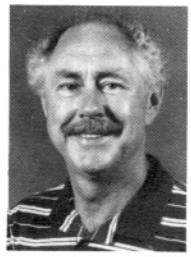

HITS & MISSES

Dale Sinner, W6IWO
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RJ MOVE

We have not yet moved. The home transfer has not taken place and we are informed it will all be over by the end of this month. So again I ask for all to be patient while we go through this transition period.

READER SURVEY

Lots of these survey forms have been returned but we still need more. Please take a few minutes and fill out the survey form on page 21 of the September 29 issue of the RJ. The RJ wants to publish what you want but if you don't tell us, then how can we satisfy your needs. Even constructive criticism is welcome. We really want to know!

Our thanks to all those who filled out the form and returned them to our office. Your comments will help in deciding what kind of material to publish in future issues.

FAX Material

This month Richard, N6NKO, has again reviewed another FAX device in his Packet column. Lots of these devices have been sold but we have yet to receive much feedback from users. If any of you have some experience using these devices and would like to share your experiences with all of us, please write up your story and send it to us. Maybe you would like to write a series on FAX and it's use in Amateur radio. If so, please write or call so we can discuss your ideas.

INTERNATIONAL SCENE

It has been some time now since we last ran a series of articles about our international friends who operate the digital modes. The RJ is very interested in re-vitalizing the International Column. So those of you out there in a foreign country, we encourage you to share your digital stories with us all. You need not be an expert writer to submit your material. Do the best you can and we will do the rest. Include some pictures of your groups or your station. I look forward to receiving your input real soon. Thanks so much.

DAYTON

The RJ still has rooms available for the Dayton Hamvention. They will not last to long, so if you are still undecided about Dayton, don't wait to long. All rooms are double bed rooms which makes it possible for you to cut the cost some by sharing with someone.

Call today, and reserve yourself a room. If you wait until after January 1st, I will not have the same ability I have now to get you a room. So please, don't wait another day to secure a room.

RJ AWARDS PROGRAM

Betsy, WV7Y, our Awards Manager and I have been carefully watching this program for the last few years. Betsy has up-dated the history annually with "top ten" listings semi-annually. However, her efforts have not resulted in an increase in applicants for awards.

Therefore, Betsy and I have concluded that the RJ Awards Program be terminated due to lack of participation. A case in point. Over the last two years we have received less six new applicants and even fewer update requests. Obviously this kind of non-participation justifies the terminatio of the program.

Our thanks to all who have particpated over the years and I'm sorry about this termination.

That's all for this month.

de **Dale, W6IWO** ■

THE LINK

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Hearne, TX 77859

AMTOR INTERFERENCE

I have been lucky to get lots of data from Bill Henry, K9GWT (also president of HAL Communications), concerning the interference between digital signals sent by radio. While the data includes all modes commonly available to hams, I will concentrate only on AMTOR this month. The plots that are shown here were generated by Bill in a rather idealized way, so they represent the best of conditions. The AMTOR spectra were obtained with a HP 3461A Signal Analyzer using the output from a HAL ARQ-1000 and ST-8000 operating in the ARQ mode. The CLOVER signal was obtained from a HAL PCI-4000, and the PACKET signal was obtained from AEA PK-232. The filtering and combining of the signals was done with a spreadsheet program on a PC. The plots were made with a PC. Most of what is presented this month comes directly from communications I have had with Bill and is the result of his work. What you see is what you would get under the most ideal of conditions, that is no noise received on the radio link.

AMTOR uses 170 Hz shift FSK modulated at 100 baud. Various references assure us that this corresponds to a signal bandwidth of about 300 Hz. Two popular algorithms for data signal bandwidth are:

BW = B + 2DK = 100 + 2*170/2*1.2 = 304 Hz (CCIR)

BW = SHIFT + 2(BD/2) = 100 + 2*170/2 = 270 Hz (modem filter design)

If we look at a spectrum analyzer plot of an AMTOR signal, we find that the -3 dB bandwidth (1/2 power) is about 190 Hz and the -6 dB BW (1/2 voltage) is about 200 Hz. The calculations and measurements might lead one to conclude that an AMTOR signal is quite narrow and that we should be able to space AMTOR signals 500 Hz apart, or maybe even closer. The error in that assumptions lies in the fact that many times the desired signal is much weaker than the interfering signal.

So the real question is "What is the occupied bandwidth?" Put another way, "How wide a frequency slot do our signals require for reliable communication?" Figures 1 through 4 show plots of the data generated by Bill for different, but realistic, situations. Figures 1 through 3 show a separation between the desired signal and the interference of 500 Hz. Figure 4 shows a separation of 1 KHz. In all cases, the response shown is at the output of the receiver. In all cases, the plots are centered about the center of the desired signal (0 Hz) and the maximum amplitudes are scaled to 0 dB.

Figure 1 shows the response when the desired signal and the interference are of equal amplitude. The dotted curve is what you might expect when using SSB or "voice" filters (2.5 KHz). The dotted cure is overlain in part by the solid curve. The solid curve is the expected response from the receiver when using an excellent 500 Hz filter. It is apparent in this case that two equal strength signals, 500 Hz apart, can reliably coexist. That is provided each of them use 500 Hz filters. This figure also shows that someone using 500 Hz filters can operate within 500 Hz of a station using 2.5 KHz filters and probably not even know that he is there, but the guy with the 2.5 KHz filter is in deep Voo-Doo as they say.

Figure 2 shows what happens if we have an interfering signal 30 dB stronger (Strong Signal) only 500 Hz away. In this case reliable communication is probably not possible with the wide filters, and marginally possible with the 500 Hz filter. I have shown the pass band of the 500 Hz filter used in these simulations on Figure 2. Bill called this case the strong signal case (strong interference). Note in Figure 2 that there are a lot of extra spectral components in the lower frequency section of the 500

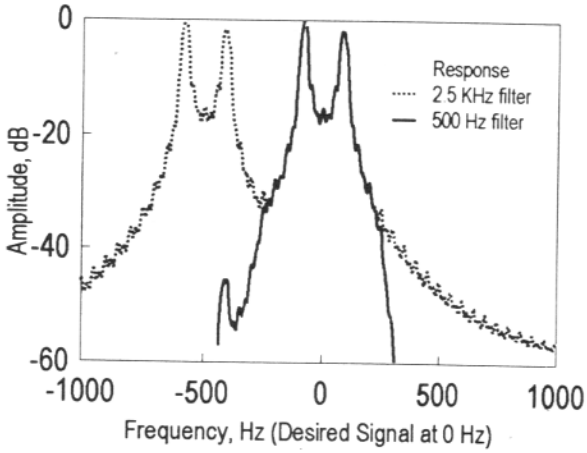


Fig. 1 SIGNAL/INTERFERENCE = 0 dB

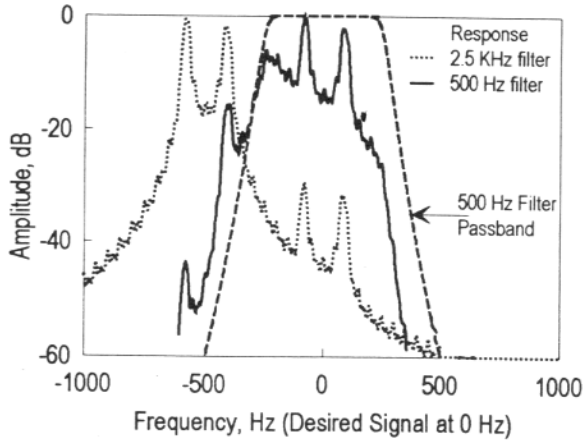


Fig. 2 SIGNAL/INTERFERENCE = -30 dB

Hz filter output. This is a mixture of the desired Mark signal and the splatter from the upper sideband of the interference signal. This appears as distortion and translates to AMTOR repeats as "hits" and are created by the mixed signals. One should expect about 25% repeats with a signal of this type. Notice that the interference is causing problems, even when we use a narrow receive filter. The interfering signal really takes up a 1 KHz bandwidth due to the splatter created on either side.

Figure 3 shows a similar situation but now the interfering signal is 45 dB stronger (Very Strong Signal) than the desired signal. Reception within 500 Hz is now hopeless, even with a good 500 Hz filter. Figure 4 shows the Very Strong Signal situation, but now with 1 KHz separation. With good filters and good gain control (AGC or limiters) however reliable print can be obtained.

The conclusion is that we should be able to reliably use 1 KHz spacing with AMTOR signal, assuming good equipment and 500 Hz filters. Figure 5 is a plot I have included so that you can think about 3 of the most common digital modes used on HF. Notice that CLOVER is by far the narrowest of the bunch (Yes, my CLOVER board is on order). Actually there is not a big difference between PACKET and AMTOR, and what difference there is comes mainly from the different baud rate (PACKET uses a 200 Hz shift where AMTOR uses 170 Hz shift).

The discussion above really only covers part of the situation concerning HF digital communication. The other part of the situation is the effect of multipath on the various modes. I will discuss that next month.

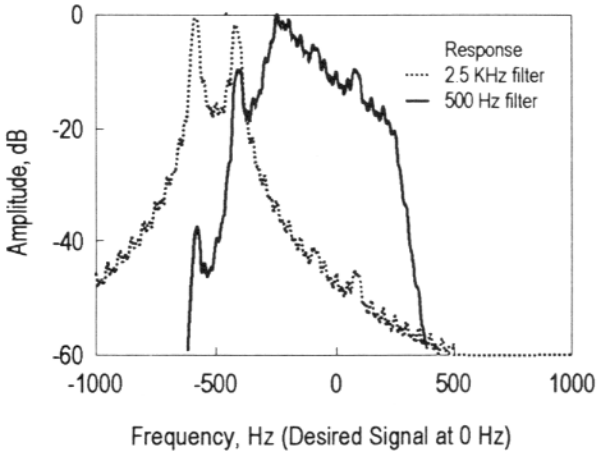


Fig. 3 SIGNAL/INTERFERENCE = -45 dB

MORE MODS FOR THE PK-232

I covered some mods to the PK-232 in the September issue. I made those mods and I can say that the results were a significant improvement in AMTOR reception capability. The changing of R 42, 52, 62, and 72 to 432 K ohm 1% as suggested by AEA tunes the band pass filter (ahead of the discriminator) to the bandwidth more appropriate for AMTOR. The original circuit has more bandwidth to allow for the reception of 300 baud ASCII and PACKET. Don, W6JL, has recommended that further improvement of the PK-232 can be obtained by optimizing the low pass filter (between the discriminator and slicer). I made those modifications and found even more improvement in the reception of AMTOR. The mod is to replace the following resistors with the values shown (all 1%):

R 112, 114, 116 = 75 K
R 118, 120 = 100 K
R 113, 115, 117 = 6.8 K
R 119, 121 = 9 K

Actually, I added the last 5 resistors so that the modification would not affect the operation of the PK-232 on VHF PACKET. The PK- 232 modified as above and with the mods given in the September issue are as good as an AMTOR controller that I have used.

That's about it for this month, next month we will talk about symbol length. That is unless I have something really exciting to say about our CLOVER testing.

73 AND GOD BLESS de **JIM, KE5HE** AT KE5HE.TX.USA.NA

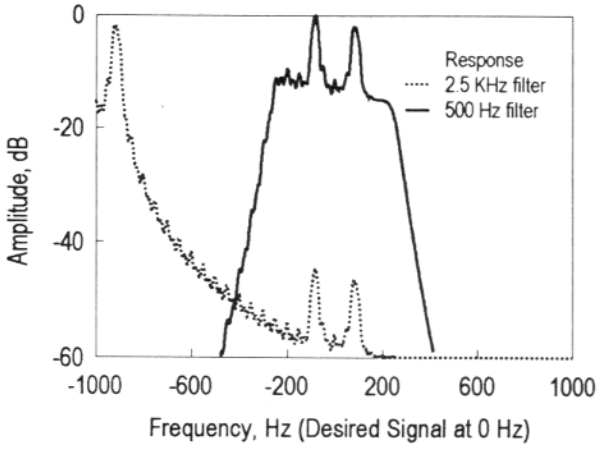


Fig. 4 SIGNAL/INTERFERENCE = -45 dB (1 KHz Separation)

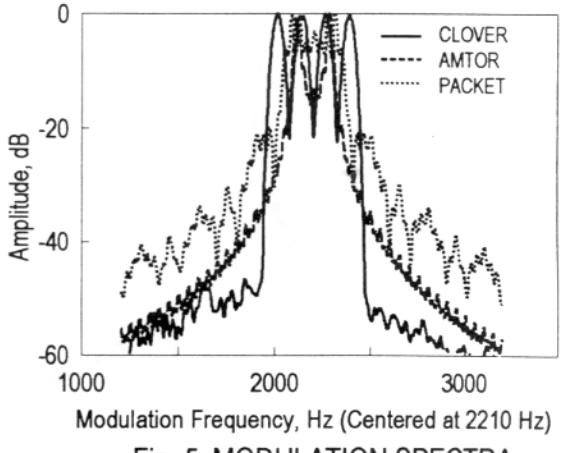
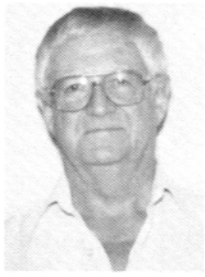


Fig. 5 MODULATION SPECTRA



CONTESTING

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Pioneer, CA 95666

RTTY Contests - Coming Events

All rules are in RTTY Contester's Guide

Date:	Contest:
JAN 2-3	ARRL RTTY Roundup (USA)
FEB 6-7	EA WW RTTY Contest (Spain)
MAR 20-22	BARTG WW RTTY Contest (England)
APR 17-18	SARTG WW Amtor Contest (Sweden)
MAY 8-9	VOLTA RTTY WW Contest (Italy)
JUN 12-13	ANARTS WW RTTY Contest (Australia)
AUG 21-22	SARTG WW RTTY Contest (Sweden)

Keyboards for Contesting

I keep coming back to the topic of keyboards. There's a reason: Keyboards are to digital communications what microphones and keys are to phone and CW.

With the advent of Personal Computers, a whole new world of communications has exploded on the scene (screen?). At the human interface of all this is the fancy keyboard. The origins of CW communications saw the straight key at the start. Then it went to 2-button finger keys, to homemade sideswipers (mine was a broken hacksaw blade, complete with pieces of bakelite for paddles and brass screws for contacts), and later to Speed-X and high-priced Vibroplex semi-automatic keys. Today, its electronic keyers with stored message capability and tone monitors. For phone there was the broken-but-ever-present single button carbon mike, courtesy of Bell Telephone Company. Then double button carbons and on to crystal and dynamic mikes. Now we have digital storage of voice messages, instantly available at the press of a button.

But the keyboard of today is a different ballgame. Rather than a simple keypad like a 12-key pushbutton telephone, or the simplisticly wonderful typewriter, we now have 101 key keyboards. (Mine has 119 keys)

At first glance there is a feeling of, "Wow! What are all those extra keys for? There's only 26 letters in the alphabet and 10 number keys, isn't there?" Yes, but... Well, you see, there's these Function keys and macro combos and...

Ahem... There's lots of ways to make keyboards more enjoyable and easier to operate. Let's take a closer look at "more enjoyable" keyboards.

KEYBOARD ENHANCEMENTS FOR RTTY CONTESTERS - and others

Here's a handy idea I came up with about a year ago. It's a simple homemade box cover for the numeric keypad on the right side. What's that for? How about a platform for a 3-M Note-it pad to write down a callsign or a frequency? Or, a spot to place a check-off list of States or Provinces? I've used it for both and it is very convenient. It is always there when you need it, and not among the clutter of logsheets, dupesheets, and banduse charts spread around your operating desk. I've made a number of them. They fit both the OmniKey Ultra and the standard 101 key keyboard. It's made of the cardboard bottom of a standard facial tissue box, such as Kleenex. The white 3 by 3-1/2 inch box cover fits snugly over the "useless keys", making a sturdy mounting for 3-M Note-it pads.

This is how I made it:

1. Take an empty Kleenex box and carefully cut out the entire bottom. Its' dimensions are 4-5/8 by 9-7/8 inches. To make a cover that fully clears the keys, and slips securely into the gap between the keys and the surrounding frame, you'll need a minimum of 3/4th of an inch sides. So, make the cardboard dimensions 4-1/2 by 5-1/4 inches. Use a thick steel ruler as a sturdy guide for a sharp Exacto knife. A Stanley Utility Knife, such as the shelve stockers use at super markets, also works fine. Use a surfaced piece of 1 x 4 soft pine as a backing for cuts.

2. Cut out 3/4 inch square pieces from each corner.

3. Put the printed side of the cardboard face down on the backing board and place the steel ruler on the inner corners of the notch. Put the edge to be bent over the edge of the 1 x 4. Press down on the ruler with one hand and bend the cardboard edge down against the backing board with the other hand. Voila! One edge complete! Do the same with the other 3 sides.

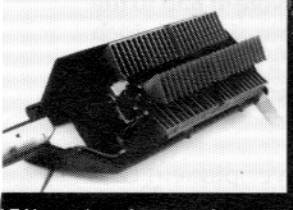
4. Use 1/2 inch scotch tape to fasten the corners together.

5. To fasten the 3-M Note-it pad to the cover, I used double-sided 1 inch wide Scotch tape. It's available from most stationery stores.

Note: Save the leftover piece in case you want to stiffen up the cover, to use for other purposes. Cut it to size and glue it to the underside of the top. I used the cover to rubber-cement a complete check-off list of all the EA provinces for 20, 15, and 10 Meters for the EA RTTY Contest last February. You might consider making a check-off list of States and VE Provinces for the ARRL RTTY Roundup Contest January 2-3, 1993. (Only one list is needed for all bands.)

FREEDOM OF SPEECH

The IsoLoop 10-30 HF Freedom Antenna frees you from restricted areas.



The IsoLoop 10-30 HF Freedom Antenna frees you from antenna restrictions.

AEA's engineering team has put together the most efficient small loop antenna you'll find for HF performance. It's the technical answer needed to send and receive from your apartment, condo or anywhere zone restrictions apply.

The reason you get such big performance in a small package is the efficiency of the IsoLoop 10-30: it's 72% on 20m, rising to 96% on 10m. Your IsoLoop delivers lower SWR and extended frequency coverage because the loop is isolated from the feedline. Your radiated power goes into the antenna, not into the shack.

Electrically, the large diameter main loop serves as an inductor and is tuned with a 10,000 volt variable capacitor to form a very high Q resonant circuit. That gives you the added benefit of suppressing both transmitted and received off-frequency signals. The capacitor itself is a heavy-duty, split stator design.

The 35" main loop is made of Iridited aluminum and is welded to the tuning capacitor to reduce loss. All welded connections and the custom capacitor further minimize losses. The very low impedance of the radiating loop (typically 0.06 ohm) is matched to 50 ohms using the technique of mutually coupled air core inductors—essentially lossless impedance matching.

Technically speaking, the IsoLoop 10-30 HF is the big value in small antennas.

To connect with the AEA dealer nearest you or for product sheets, call (800) 432-8873.

Advanced Electronic Applications, Inc.

PO Box C2160, 2006 196th St. SW, Lynnwood, WA 98036

Sales: (206) 774-5554

Connect with us

Northgate's Superb OmniKey Ultra Keyboard - highly rated by PC critics

If you are looking for an enjoyable way to operate in an RTTY contest without using a contest logging program, check out the Northgate OmniKey Ultra keyboard. It is 1-1/4th inches longer than the standard 101 key keyboard, but it has 18 more keys! It has 2 sets of Function Keys - 12 at the left side and 12 across the top. The ones along the top are called Special Function Keys, or "SF". The key thing here (pun intended), is that the SF Keys can be programed to use the same combined key function: all Shift + function, all Ctrl + function, all Alt + function, or all normal. (It defaults to all Shift +)

Setting the SF keys is simplicity itself. Just press the "SF Select" key at the upper right hand corner of the keyboard, and hold it down while you press, say, the Alt key. That's it. Now all SF keys are Alt + the particular F number.

Once you've set the SF Keys to, say, Shift + F key, only the SF key need be pressed. The beauty of this is that if you store messages (macros) using Shift + Function key, then only ONE solitary key need be pressed. No more hunting for the Shift key or the Alt key with one hand and pressing the Function key with the other. This is a single handed, single fingered operation!

Furthermore, the keys along the top are very easy to label using your dot matrix printer and a little ingenuity. If your printer can print 12 characters per inch and 6 lines per inch, you've got it made.

Here's an additional bonus for those who use PC-Pakratt V1.06 software and the PK-232: You can make your own Hot-Key combo be just ONE key. By Hot Key I mean that when you press a certain SF key, your radio goes into transmit mode, sends the message, then reverts back to receive. PC-Pakratt allows you to

assign the F3 (Transmit) Function key into a macro. To make a Hot Key, press Ctrl + F9 and start the "softkey message" with F3. Type out the message, and end with Ctrl + D. That switches the rig back to receive. I have assigned SF1 to be my "Hot Key CQ", and labeled it with a bright orange 1/4 inch round label with the black "CQ" decal on it. (Details of making your own colored key labels appeared in last month's column.)

I have assigned SF10 to be my "3 x QUICK" key. When I need to immediately jump into a pileup, I simply press SF10. It switches the radio to transmit, sends my call 3 times, and switches back to receive. Again, a bright orange 1/4 inch round label with 1/8 inch black "GG" identifies that key - for instant use! All the other SF keys are assigned things like "QRL?", "QRZ?", "R-R", "TU", "RST ++", "((73))", "BK", etc.. Again, all these are single finger macros.

Note: PC-Pakratt II will NOT assign F3, so it cannot make Hot Keys.

Regarding the Function keys on the left side; I use them with the Alt key to make 10 additional macros. I use bright blue 1/4 inch round labels on each key, with appropriate decal letters on them. When used with the bright blue label on the Alt key, it's an automatic color match. No thinking needed! I also have made paper templates that surround those keys. If you have a dot matrix printer that can print condensed print (17 char per inch), then you, with a little practice, can make them, too. Before cutting out the center, stick address labels on the back to stiffen up the paper. Dabs of rubber cement help to hold them to the keyboard frame, and makes for easy changing to different programs.

First Annual JARTS WW RTTY Contest of October '92 - some recap thoughts

- There was certainly a lot of participation by the Japanese RTTY gang. I never heard (saw?) so many JA stations on RTTY! I had 145 JA QSO's in the Contest., all on 20, 15, and 10M.

- Propagation conditions were not all that good, especially on 40 and 80M. While waiting for sunrise Saturday and Sunday morning, I was surprised to find 20M completely dead. Also, I heard no RTTY activity on 40M at that time, even though CW and SSB portions were active with foreign signals.

- Its important to remember that Sunday in USA is Monday in Japan. That fact accounts for fewer Japanese stations on Sunday. Why? They have to go to work!

- Some suggestions to help stimulate international interest in this contest:
  a) Band multipliers will create more activity on the low bands. This is really needed because propagation decline of the 11 year sunspot cycle will kill 10M and seriously affect 15M, too. That leaves 20 and 40M to carry the load. Band multipliers will not only open up 40M, but will get the operators to make 80M skeds, too. Band multipliers will arouse more overall activity.
  b) It is not clear just where the Japanese RTTY bands are on 40 and 80M. The area around 7080 to 7090 that USA operators use gets filled with Japanese SSB. Does JA SSB share with RTTY? I have worked JA and European RTTY stations around 7035 to 7045, but I'm not sure if Japan shares that area with European RTTY stations, too. This confusion should be cleared up and announced in future contest announcements - not only for the Japanese but for all contests.
  c) More publicity is needed. The JARTS WW RTTY Contest was NOT announced in QST or CQ. The RTTY Journal carried it in the August/September issue, along with my special JARTS logsheet. Many called on the air, asking what JARTS was all about, what the exchange was, etc., so the interest was there.

I'd like to hear from you. What are your thoughts on this contest - or any other, for that matter. Is there something you think needs to be "aired"? We can use this column for all kinds of contest-related subjects.

Tip of the Month:

When manually logging a contest, sometimes you may forget whether or not you entered the station's call in the dupesheet, especially when running a pileup. Suggestion: Right after

entering the call in the dupesheet, put a dot after the call in the logsheet. Due to the uneven ways that pileups run, you may not get that entry in the dupesheet right away, but you will always know where you stand. Then bring the dupesheet up to date during your CQ transmissions.

I always maintain dupesheets all during the contest. It's a big help when your pileup disappears and you have to start hunting for QSO's, knowing full well your dupesheet is current. When you see a call on the screen you'll instantly know if you have worked him before with a quick dupesheet check. This is especially important in the last part of the contest, and there is a band multiplier at stake. For instance: You may think that you worked 5U7M on 20M, but a quick dupesheet check shows your QSO was on 15M, not 20M. Whoops!

By the way, in order to keep logsheets, dupesheets, and multiplier sheets from getting all mixed up, try using colored manila folders. Use a different color for each band, label them, and diligently keep the papers in place. If you do much band hopping, you'll find that little extra effort a great big help.

73, CU SOON, in the pileups!

Merry Christmas to ALL!

de Rich, N6GG ■

SOFTWARE

Jim Mortensen, N2HOS
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Indian Rocks Beach, FL 34635

ACUTERM

The DOS cursor flourishes in Milford, MI. And Bill N8BA plans no switch from it to Win3.1, OS/2, DV/X or any other upstart operating system. Of course Acuterm will work under any of the new systems and all reside on his hard disk. But none promise any improvement in quality or efficiency for this excellent terminal program, at least for now. Don't wait for a cosmetic upgrade to a Win3.1 version!

Acuterm's sale conditions are a bit different than most. To quote, "Acuterm is neither 'commercial,' (primarily for profit), nor 'shareware,' to be mass copied by others without permission." The price beginning January 1993 is $35 (+ $5 S&H), upgrades are $10. A registration number is provided with each order which is valid for all versions produced in a given calendar year. Users are free to get upgrades from other users. There is a 30-day return privilege. Order it, if you are in need of a terminal program from W.R. Kissel Box 395, Milford, MI 48381.

Acuterm is a comprehensive terminal program written specifically for the AEA's PK-232. It runs on IBM clones with DOS 3.0 or above, primarily on machines with a hard disk. This all-mode software includes logging, mailbox, mini-editor and more. Extensive use is made of hot keys and macros for the experienced user. Log sorting and printing are delegated to the companion program, a data base written by John KF8CU. ^f This is an independent program and is included on a shareware basis. The Acuterm fee does not go to the support of this add-on. No registration fee is requested, but a pat on the back would be most welcome.

The manual suggests you use COMM 1 for the PK-232 and COMM 2 for the transceiver interface. In COMM 2, if you have a Kenwood rig, enjoy full transceiver control functions. Frequency, mode, RIT, etc., can be managed with a few key strokes. Other brands benefit to some extent. Commands to the transceiver can also issue from either the log or the mini-text editor. Frequency, Mode, Station, Name and QTH can be included. Format spacing is critical for it must match the looks of the log form. While this may not be the ultimate in computer control, clearly this feature will appeal to many users.

Mini-editor is well named for there is no intention of investing it with the powers of a word processor. The design allows for the writing of short notes, altering little files or other small jobs. Any major editing or writing task requires the addition of a major league editor (like Norton) or word processor.

NITS TO PICK

Several years have passed since I was a full-fledged user of Acuterm. My software of choice until I opted for the Hal PCI-3000, the changes made since then are significant and positive. The author, helped by the input of a band of loyal followers, churns out upgrades on a vigorous schedule. Version 0.460 (the one most recently provided to me by Bill) is professionally polished and a pleasure to operate. But nagging little problems remain.

I received two disks, 3 1/2 and 5 1/4. Nice, except that there was nothing on the small disk! Thus I had to copy the big one to the little one before I could load it on the right computer. Well, that wasn't too bad. On the disk label it said, type "PRNT_DOC.BAT" to print "ACUTERM\INSTALL.DOC AND ACUTERM\OPERATE.DOC." Although Bill furnished a stapled copy of the OPERATE.DOC, I did want to look at the primer in the other document. So I issued the proper command. It promptly printed out what I already had and ignored the INSTALL.DOC. Well, that wasn't too bad either since I quickly arranged to print it with the normal DOS commands.

I read both DOCS carefully and acknowledge that there has been fundamental improvement in organization and clarity. That is an important move, for Acuterm had a glaring weakness in documentation when I was a user. Some, maybe many beginners will now get the program up and running without calling on Bill or other experienced Acuterm users for help. Good news. However, there is room for further improvement. A simple on- line tutorial would be a boon to many newcomers to the digital world. One small chapter devoted to installation, parameters, and making the first packet contact would make it so much easier.

Joe W6UYH, a user of Acuterm for two years agrees. He feels the installation of the RAM drive is a bit "difficult for beginners."However, he still feels the program is rated superior for beginners. Adam KA2UOL also rates it a "very good program to start off with. But he or she (no sexist Adam) will have to read the instructions at least two times. Before trying to jump right in like a know-it-all." He feels that hams just won't take time to read the directions. That's right because hams are like other people. Nobody reads directions these days. Just punch the ON button!

Of course learning software is a two-way street. Users must invest both time and intelligence. But the author must assume that new users for any digital program are only one step more than minimally experienced, either with the computer or the digital mysteries. Modest programming effort would pay an enormous dividend here. And make many good friends and satisfied customers.

Letters confirm that point every month. Bill, N6RUH, wrote recently to thank me for recommending PackrattII for his particular problem. "The manual is written for beginners like me," he said with relief after trying and failing with most of the other terminal programs. He has a point.

The installation, once the disk mess was straightened out went smoothly. But, please, when the install routine stops to ask for the registration number, why doesn't it ask for MYCALL and MYSELCAL as well? The subsequent confusion about this little detail could be eliminated so easily.

I marvel at the programs almost instant programming of the PK-232 during the INSTALL process. By the way, it is a good idea to pull the battery jumper out of the bottom of the unit so it can be set up from scratch the first time around. Unfortunately, all the parameters go zipping by, much too fast to read. And so does the summary screen at the end of the process. A pause there would help us understand what has been set up in the mad scramble that just took place. Give us a chance to press ENTER when ready!

MUCH TO LIKE

Actuterm boots to a clean, logical and efficient screen. The upper two-thirds contains the transcript of the QSO and below it the three-line logging section. Last, at the bottom of the screen, three lines are devoted to the typing monitor. While this may not sound like much space it is sufficient to the task. This uncluttered look and feel of the screen appeals to me. My aging eyes don't get lost in a maze of peripheral information here. Well done.

The Help screen is instantly available in all modes. Press F1 and all 37 key combinations show up for each category. Lots of commands, but a careful reading proves the need for and the logic of each. There is no overkill at all but you will find a complete arsenal of keystrokes to run the system. Bernie W2IDX comments, "All the modes are quite similar in the Help file, so one does not need to be a rocket brain to soon become an expert. As with all software, the more one uses it, the easier it is to enjoy." Master this for each mode and you have mastered the program.

Perhaps best of all, the logging operation. Alt-F8 brings you into and out of the log. F7 searches for all past contacts. SHFT-F7 searches for QTH matches instead of callsigns. I like that. And another good point, nothing goes into the Log unless you hit Alt-F8 the second time. At the end of the QSO or whatever, if you determine that the log should not be updated, just delete the callsign. Nothing then clutters the log and you can go to the next QSO. This is first class work. Ed N5CQZ agrees and said, "I have been using Acuterm from the very start. It was the logging program that got me interested in it to begin with."

Product support receives the highest mark from Acuterm users. Bill devotes so much time to the product that Adam wonders how his XYL puts up with it. "Changes come almost as fast as new things are asked for," says Adam and others agree. Bud K4MVM who rates the program's quality and dependability "excellent," calls the support simply, "the best." Not bad. Bud's sole complaint, a minor one, is that he would like to see the program load a little faster. But people with fast computers think that of all programs. Hi!

Is it worth the $40 outlay? Adams comment sums it all up, "It is worth more than that just for the abuse he has to take from the beta testers when they find a bug that needs fixing." Well, I don't know about that, but I see the program as one of the better all-mode terminal programs available. It could be improved, particularly for the beginner. And we have lots of those out there. Ed, again, "First let me tell you I'm no whizz on this computer, etc. When I first started I needed Bill to sort of do the loading for me." Fortunately, outstanding support is available seven days a week by calling Bill at 313-685-8671 between 7-9PM eastern time. No orders by phone, PLEASE. Remember Acuterm can be returned for a full refund if it doesn't meet your needs.

Thanks to all those loyal Acuterm users who wrote to me. You are true fans. I didn't hear, at least to my knowledge, from the 93 year-young user of the product. I would enjoy that meeting, either eye-to-eye or on the air. Pray that I can sit at and see the keyboard when I reach such a wonderful age!

SHAREWARE

This one is freeware. If you use Windows, you need to get to the DOS command line. Sometimes the need is urgent and often, other times it is simply a matter of convenience. There are two ways to accomplish this. Either find the Progman Icon if you can, switch to the Main window and click the DOS icon. That procedure is valid and often takes no more than five minutes. Sometimes it is easier to quit Windows, for then the full power of the DOS prompt becomes available to you. Now there is a different and better solution.

I downloaded IMPOSTER from America OnLine. It was sixteen minutes well spent. This thoroughly documented (about 50 pages) program has a totally new approach. The "C:" icon rests full time on the desktop. Click it and you have launched DOS as a windowed Win3.1 application. Do anything from copying files, launching DOS or Windows programs (maximized, regular or minimized), running batch files--and do it all with greatly reduced memory utilization. Win3.1 can even "borrow" memory from IMPOSTER if space gets tight. Change the setup in the Win.Ini file and you can reach the DOS prompt from within any pro-

gram with a hotkey of your choice. This is a fine addition to any hard disk. And though I do not have a lot of experience with it yet, it seems to be free of bugs. Darrell Burgan of Plano, TX has given us a sure winner, and it's free!

COMPLAINT OF THE MONTH

Cass KG5IT wrote a thoughtful letter about LAN-LINK. A long term user he took me to task for blaming the author for the misuse of the automatic features of the product, particularly those that I blame for polluting the HF bands. He feels strongly that the individual operator is to blame. Further, that responsible amateurs should not be denied the use of such features. And, finally, he pointed out that I had missed the cautionary statement about automatic operation in the DOCS.

Perhaps he is right, but this product can be picked up by anyone anywhere for little or no cost. And the siren song of the auto-beacon is too beguiling for some to pass up, responsible or not responsible, experienced or not experienced. You be the judge.

I did miss the cautionary statement. "Do not use it on a crowded HF channel . . . Do not leave it running on 20 meters when the band is open." I apologize for that omission, though the latest bandplan proposal would eliminate the problem except in designated portions of the spectrum.

But I do not wish to withdraw my opposition to unattended operation of any kind, in any mode, on any HF frequency. Despite the latest recommendation of the Digital Advisory Committee, I think unattended status suggests that such a station has a priority over any other traffic in that part of the band. Such designation suggests also that the traffic flowing from an unattended station is significant and of more importance than other forms of communication. Nonsense! Read the mail sometime.

Except in officially declared emergencies (such as Hurricane Andrew), when the need for priority treatment of Health and Welfare traffic is obvious, every responsible amateur operator should have equal access to all--repeat all--the digital frequencies in the mode of choice. Until then, we hold those rights in common . . . and should enjoy them in common. The designation of special segments of the band, some outside the normal digital frequencies, does not soften my attitude one whit. We are simply impinging on another's right to equal access. Sorry, Cass.

G/L 73

de **Jim, N2HOS** SK ■

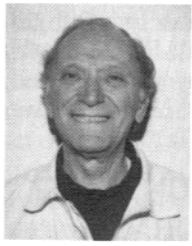
DAYTON ROOMS

If you are planning to attend the Dayton Hamvention in 1993 and would like a room at the Radisson hotel where most of the RTTY action takes place, please let me know immediately. We still have some rooms available but they will not last much longer.

If you wait until after January 1st, I may not be able to help you obtain a room. All rooms are double beds, so if you wish, you can share a room with someone which would help defray the cost of the room.

Again, don't hesitate, call today!

de **Dale, W6IWO**



DX NEWS

Jules Freundlich, W2JGR
825 Summit Ave., Apt 1401
Minneapolis, MN 55403-3188

As expected, conditions following the autumnal equinox were great with only a few flares to mess things up. We saw the solar flux rise to 175 once late in October, and briefly to 229 in early November. With the A index at 3 of below, there were times in October when the K index was 0. Conditions for the contest of the Japan Amateur Radio Teletype Society (JARTS) gave rise to lots of activity to welcome this newest on-the-air joust. The following weekend the explosions on the bands from the CQWW SSB contest resulted in a dearth of RTTY activity, proving once again that we RTTYers are a multimode crowd. It is true that some stalwarts such as Carl, K6WZ, and Bob, W0HAH, do not own keys or microphones but it appears they are in a minority.

This hobby is full of surprises. The latest one was the appearance, in mid-October, of Carl, WB4ZNH, and his XYL, Martha, WB4FVU, on SSB and CW from Ethiopia signing ET3BC and ET3YL, and subsequently from the Ethiopian province of Eritrea signing 9ER1TA and 9ER1TB. I was waiting for one more surprise, but it never came. Carl is a recent convert to RTTY and was quite active when he first came up on this mode in late summer. I hoped against hope that we would have a RTTY shot at this rare one(s). But it was not to be. Let us hope that the next time Carl operates from those places, or other rare ones, that he will bring his laptop along. If you have occaision to chat with him or Martha, encourage them to do so. (See comments under NEW DXCC COUNTRIES.) Carl and Martha are seasoned DX travelers. In the early '80s they gave us such nice ones as 5X and TT on non-RTTY modes.

It is comforting to observe that most popular RTTY DX stations have learned the art of split operation. And it is nice to know that some who prefer to operate transceive try to thin the pileups by going by call areas. And what is their usual procedure? They start with ones and end with zeros. Please gentlemen...for the benefit of the suffering sixes, sevens, eights, nines and zeros...be a little more creative and vary the sequence so that these anxious folks have a fighting chance. It is not uncommon that by the time the nines and zeros are called, the band just folds. Rotating quickly through the numbers gives most areas a fair shake. Kudos are due VP8SSI, for when they started calling by the numbers, they started with the zeros. Thanks Ralph, David, Terry, John, Tony, Al, Mas, and Martti. Hallelujah!

DOINGS

BELIZE, V3 - Look for V31RY by Glenn, AE0Q, from 22-30 November. QSL to WN0B.

BURKINA FASO, XT - We have not heard of any RTTY activity for about eight or ten years since XT2AU was here. Now it has come alive again with the enthusiastic presence of XT2BW. Look for him on 10, 15 or 20 meters according to propagation conditions. You might also listen to his Sunday SSB QSO with his QSL Manager, WB2YQH, on 14211 around 2100Z. He may QSY to RTTY on request to 14085. On another note, Ted, W2FG, spoke to XT2DK on 17 meters who told Ted he has a PK-232 but had not yet unpacked it. Ted alerted Peter, TY1PS, in the hope that Peter will help XT2DK become QRV on RTTY.

CHATHAM IS., ZL7 - Ron, ZL1AMO, will be QRV fsrom here through 24 November. QSL via his CBA.

CRETE and DODECANESE, SV9,SV5 - A team of three Hungarian operators, consisting of HA6NA, HA6PX, and HA6ZV will be active from these Mediterranean islands from 26 November through 5 December.

CROATIA, 9A - In spite of the unhappy state of affairs in this part of the world, several stations are active on RTTY. 9A1BHI may be found on 15 meters around 1540Z. QSL Ante to P.O. Box 88, 50000 Dubrovnik, Republic of Croatia. Zeljko,9A1CRT (what an appropriate callsign!) sometime comes up on 15 meters around 1700Z. QSL to P.O. Box 564, 41000 Zagreb. Also active is 9A3IM on 20 meters around 0940.

DESECHEO, KP5 - The intrepid crew consisting of Randy, N0TG, Bob, KW2P, Murray, WA4DAN, Ron, AA4VK, and Will, AA4NC, are still planning to give many of us a new one from 28 December to 4 January. It is not too late to send your contribution to Randy Rowe at P.O. Box 891, DeSoto, TX 75123. They need all the support you can give them.

EQUATORIAL GUINEA, 3C - 3C1EA continues to be active. Look for him around 0600-0700 on 14080. QSL to EA4CJA.

GUAM, KH2 - Don't forget to look for KH2S just before and after the CQWW CW contest 28-29 November. QSL via JH4RHF.

GLORIOSO, FR/G - We hope that the trouble that Jacques, FR5ZU/G, was reported to have had with his "electronic log" was trivial!

HONG KONG, VS6 - Les, K2SHL, hopes to operate from here some time in December if he can find a suitable operating location. QSL to his home CBA.

IRAQ, YI - Still looking for a card from YI1BGD? OPDX/BARF80 reports that OE6CRD holds logs since 1989. Write to Christian Steger, OE6CRD, Haus Nr. 104, A-8132 Pernegg, Austria. In the meantime YI1BGD may be found from time to time around 1340Z on 21088, and 1440Z on 14084.

JUAN FERNANDEZ, CE0 - CE0ZAM has been active on 20 meters between 2330Z and 0200Z.

KAMPUCHEA, XU - John, PA3BTQ, is in XU-land working for the International Red Cross installing HF digital gear. We hope that he will be able to give us some RTTY from here.

KINGMAN REEF, KH5K - Still hoping to see this one in early 1993. No details yet.

MADAGASCAR, 5R8 - The brief appearance of 5R8DF in late October left this country on a great many lists of Needed Countries. Shin, JA3AUQ told me that the operator reported that there were unfortunately no contacts with North America. Shin said however that another trip to the island was expected in the near future. In the meantime the International RTTY DX Association (IRDXA) is trying to find a way to get RTTY gear to George, 5R8AB.

MINAMI TOROSHIMA, JD - JK1AB/JD1 will be here until 14 January 1993 and is said to be operating SSB, CW, and PACKET. Does he also have RTTY in his bag of tricks?

MOROCCO, CN - Frank, CN8NP continues to put a nice signal into the USA on 20 meters around 2200Z. For a prompt verification, QSL with SASE to Frank Patri, C/O American Embassy Rabat, PSC 74, Box 024, APO AE 09718, USA.

MOUNT ATHOS, SV/A - Since my reference last month to the tooth fairy, I had a nice chat with Doc, JA3PFZ. Doc confirmed that he did indeed receive an invitation to operate RTTY from this place. He told me however that the "Mount Athos Headquarters", as he put it, was not ready to grant permission as they had a recent problem "with a German ham." But Doc stated he still has hopes. Good Luck, Doc! We all need SV/A on RTTY.

SAN FELIX, XQ - John, XQ0X, the lobster fisherman is back on San Ambrosio for his four month stint. Look for him on 15 amd 20 meters. QSL to CE3ESS.

SEYCHELLES, S7 - S79PDL has been quite active. Look for him around 1800Z on the lower end of the RTTY slot on 15 or 20 meters. Try him also on FEC on 14074 around 1255Z. QSL to P.O. BOX 448, Victoria, Republic of Seychelles.

THAILAND, HS - Look for a station signing A28DX operating from an island in the Gulf of Thailand for a three day operation December 10-12. (tnx OPDX/BARF80)

SOUTH ORKNEY, VP8 - Brian, VP8CFM, told me that his operation in the CQWW RTTY contest almost resulted in "disaster when penguins got into the "genny" shed." However Brian is still there giving a new one to the deserving on 20 meters around 2100Z.

TROMELIN, FR/T - Jacques, FR5ZU, told Jean, F8XT, that he plans to operate RTTY from this island sometime next spring.

POTPOURRI

DX ADVISORY COMMITTEE (DXAC) - In late September the DXAC voted that the following recommendations be made to the ARRL Awards Committee. Add the following to the DXCC Countries List:

Country	EffectiveDate
Croatia,9A (was YU2)	26 June '91
Slovenia,S5 (was YU3)	26 June '91
Bosnia-Hercegovina. YU4	15 Oct. '91
Macedonia, YU5	8 Sept. '91.

The DXAC also recommmended that the entity of Yugoslavia continue on the list. This entity is now composed of Serbia (YU1), Montenegro (YU6), Vojvodina (YU7) and Kosovo (YU8).

These recommendations will now be reviewed by the Awards Committee and start dates will be announced after the committee acts. You can probably look for several months of delay for an announcement. With the current backlog at the DXCC desk (about 6 months as of end of October) it is highly unlikely that an early flood of these cards will be invited. QSL cards should NOT be sent to the DXCC desk for these countries until they have been officially added to the list and a date for acceptance has been announced.

Speaking of these countries, the United States Postal Service (USPS) asks that DXers use the newly recognized international names of the countries: Bosnia-Hercegovina, Croatia, Slovenia, and the former Yugoslav republic of Macedonia. Only contacts with stations in Serbia and Montenegro should use the word "Yugoslavia" in the address. (Tnx DX Magazine). They did not mention that Vojvodina and Kosovo, as noted by the DXAC, are also part of Yugoslavia. I assume this was an oversight.

The DXAC also voted not to pursue the following items: 1. Changing the DXCC country status of former USSR Republics. 2. Consideration of a DXCC rules revision to permit participation by stations located on board docked ships in ARRL Awards programs. 3. A study of advanced DXCC awards. 4. Changing the DXCC status of 4U1VIC.

NEW DXCC COUNTRIES?

Last month I mentioned a movement to make the Temburong District of Brunei, V8, into a separate DXCC country. The reasoning of the petition, by two Brunei amateurs, sent to the DXAC is that Temburong District is completely separated from the remaining part of Brunei by West Malaysia, 9M2. They feel that this falls under the DXCC country criteria "Point 3", separation by another DXCC country. It turns out that the separation is only 10 miles, and "Point 3" states that two land areas must be at least 75 miles apart between the two closest points of the two areas divided. This, therefor does not appear to satisfy the specific criteria. (Tnx OPDX/BARF80) You would think they would have read the rules first.

According to The ARRL DXCC Countries List, January 1992 edition, Eritrea (then ET2) was deleted as a separate DXCC country and became part of Ethiopia, ET, on 15 November 1962. Apparently it has now achieved some mode of independence and perhaps will again qualify for separate DXCC country status. At least that is the hope of Carl Henson, WB4ZNH, who plans to submit such a petition to the DXAC. Stay tuned.

RANDOM THOUGHTS

How many years did you wait to work Wake Island on RTTY? Yet this was heard recently on 21083 at 0030Z: KK4DK/KH9 CALLING CQ DX CQ DX ANYONE ANYWHERE! (Exclamation point mine...JGR). .....Inanity of the month: WON'T HOLD YOU. THERE ARE MANY OTHERS CALLING YOU.....My limited sampling of ages as copied in the JARTS contest says that 66- 2/3 percent of male RTTY contesters world wide are between the ages of 38 and 65 with a spread of from 28 to 76. Sample size is 74; average age is 52 and standard deviation is 13.8. What did you compute, and what should be done about it? Did anyone do an analysis on a geographic basis? My sample was too

small to do that....."KN" when sent at the end of a transmission is an invitation to the station being worked to transmit. It is not another way of saying CQ or QRZ? So control that impulse to hit the keyboard. You will probably be messing up the finish of the DX station's QSO. At least wait for a QRZ, or a CQ or at least an SK. Let's try to keep this a gentleman's (gentleperson's) mode. Ha! 'Nuff said.....

QSL HELP?

Last month I mentioned that Bill, AA4M/6 had been unsuccessful in obtaining a QSL from the YV0AA operation of April 1990. It seems that Bill is not alone in his frustration. Since Bill's letter to me, it has come to my attention that his is far from being an isolated instance. I know that at least KR9O, NN2G, WB2QJY, KE6TM and others have sent multiple requests to no avail. That expedition was a singularly well run all-digital operation. It is too bad that its reputation is being colored by this situation.I hope that the Radio Club Venezolano and the expedition operators YV5IZE, YV5HKD, YV5KAJ, YV5LMG, and YV5MVP will take note and do whatever they can to clear this problem.

Bob, W0HAH, needs help in obtaining a card for a 4 June 1991 20m QSO with FB8WZ. He has sent two cards, to the French Bureau of Communications, Station 3, Crozet I., via France, with no luck. If you know how to help, send Bob a postcard at his CBA, or leave a message with me.

HAVE DX NEWS?

I can be reached directly by dropping mail into my APLINK, leaving a message in the APLINK boxes of TG9VT or CE3GDN, sending me a packet message addressed to W2JGR@WB0CQG.MN.NA, finding me on RTTY, telephoning me at (612) 377 7269, or FAXing me at (612) 874 8161. When these high tech approaches fail, the U. S. Postal Service can find me. When I am not chasing DX, my APLINK listens on 21074 during daylight hours and 14074 at night in the Central Time Zone. Set your chirping to WJGR.

THANKS - Thanks to the following for all your information: F8XT, HC5K, I5FLN, JA3AUQ, JA3PFZ, K2SHL, KE6TM, KW2P, TG9VT, VK2SG, VP8CFM, WB2CJL, W2FG, and W6PQS Without your help there would be no column.

See you all next month. For now Bye Bye from Minnesota....PAX...73.

de **Jules, W2JGR** ■

CONTEST FLASH

The Troy Amateur Radio Association (TARA) announces it's first annual RTTY SPRINT contest. The purpose of this sprint is a warm up to the ARRL RTTY Roundup contest that will be held on January 3-4, 1993.

Test Period

1900Z to 2300Z December 13, 1992

Bands

80, 40, 20, 15, and 10 meter bands

Categories

Single-Op, single transmitter; Multi-Op, single transmitter. Separate categories for more or less that 150 watts power.

Exchange

Signal report and state. DX stations send serial #.

Scoring

Each QSO on each band counts as one point with each state or DXCC country being a multiplier. Multiply total QSOs times multipliers for final score. Please indicate your operator status and power output on your entry.

Deadline

Entries must be postmarked by January 15, 1993

Mail Logs to

TARA c/o Bill Eddy, 2404 22nd St., Troy, NY 12180. A SASE will ensure that you receive test results.

PACKET

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

ALL OF THE FAX, AND NOTHING BUT THE FAX II

I was handed a package to review and due to a time limit on having the package, I am dropping it in here. This new package from AEA will allow you to copy FAX from HF and the weather satellites, with the proper reception equipment. The name of the package is AEA-FAX. The package comes with the requisite instruction manual, MS-DOS software for 5 1/4", 3 1/2" drives, and the AEA-FAX decoder. The unit plugs into a 25 pin RS-232 serial port. The unit also has a replacement connector to allow you to use the port with another device when not using the AEA-FAX unit.

Let me explain what FAX is and how it works. FAX or its proper name, facsimile, is the process of sending pictures from one place to another either over wire or radio. The picture is sent by using a set of tones that represent black and white. The high tone is white and the low tone is black. You can send gray-scale pictures by varying the tone between the black and white tones. The picture is sent by scanning a picture, line by line, and sending out the proper tones relative to the color of the spot scanned at that moment. At the beginning of each picture transmission, the sending machine sends a series of tones to "sync up" the receiving machine. Upon synchronization, the sending machine starts sending the picture. The receiving machine lays down what it receives. The receiving machine must be at the exact same speed that it was at start-up. If there is any change in the speed of the sending station or the receiving station, the picture comes out skewed. The transmission is completely "async" in this case.

This procedure of async transmission allows for many receivers to listen to one broadcast with no handshaking involved. What happens in PC based software is that the machine receives the information from the demodulator and then processes it into the picture that we see displayed on the screen. Here again, the program has to be able to cycle fast enough to process the picture correctly. Because of slight differences in the way a given system processes information, you may need to have the program adjust its loop timings in order to receive straight lines.

Just about all faxes that are sent are either gray scale or line drawings. The only color faxes that I have seen have been done by amateurs. The AEA-FAX has available to you four display modes, false color, black & white (line drawing), 4 shade gray scale (ega), and 16 shade gray scale (vga). This allows the program to compensate for a particular system or to the need of the user. The shade settings can be customized to meet the needs or desires of the user. There may be times that the shades can be played with to bring out a desired area or change. The false color mode is great from the standpoint of being able to make subtle level changes stand out glaringly.

Tuning in the signals can be a bit on the frustrating side without the use of a tuning display. Since the adapter is about the size of a RS232 gender bender, a display device cannot possibly fit into the unit. Therefore the needed display is produced by the program. The display can also be on screen while you are receiving a picture. This is useful to check your tuning and see how well the signal is coming into your decoder.

You have the ability to print out the pictures that you receive or save them to the disk. I will say this, the pictures look better on the screen because of the higher resolution available on your monitor. That is if you are using an EGA or better monitor system. With a monitor, you can vary the brightness of each pixel that is displayed. While on a printer, that is not possible. The individual pixel is either on or off. To overcome that deficiency, you use a process known as "dithering." Dithering allows you to display some gray scale on a black and white device by figuring out how many pixels in a given area are "on" to simulate shading. The shading is not perfect and you do lose much in

terms of resolution but no reasonably priced printer is going to beat the 1024x768 resolution of a monitor.

The display mode has the capability of zooming into an area of interest. The available amount of zoom is great enough where you can zoom in and see an individual group of pixels. That is a little too much because with that much magnification, the detail looks more like a texture map used in computer graphics than a picture of a weather front.

Overall, compared to a different FAX program I have here, this package from AEA wins hands down. The reasoning behind my decision is that the adapter has a port jack on the other end of the adapter so I do not lose the availability of the port. The software is smoother to operate and it is easier to configure the various displays. If you are interested in receiving FAX, this is a great package to purchase for your station.

PACKET RACKET

This will be the final installment involving the PkGOLD communications program. Last month, I discussed the majority of the software and now I am going to hit upon the packet aspect of the program.

The packet section uses the same switchable menus that are used throughout the package. This is where the banner at the bottom of the screen changes as you hit either the "alt" or "ctrl" keys. This is a great help and time saver since you will not need to search through a list of menus to get to an operation that you may wish to perform.

Back when groups wanted to get together for a chat, everyone had to run "unproto" mode so everyone could see everyone else and what they were saying. Well, that is no longer necessary. This program has the ability to conference anyone connected to the station. That allows one person to send a comment and all who are connected will see the message. The nice thing here is that all stations are running in connected mode, so no station will lose out on seeing what the other stations have typed. One of the biggest drawbacks to this mode of operation is that it eats up channel throughput, big time. This mode should not be used on a busy channel. If used on a quiet channel, it is great.

A more archaic variant to the conferencing process is called multiple connects. This is where the station is connected to several stations at once and each station is conferenced via its own connect. This means that the operator has to keep switching between screens to see what each connect is doing. That can be a bit harrowing when you are talking to several stations at once while other stations are sending you reams of information, all at the same time. With this program you simply use the function keys to facilitate the transfer between sessions.

Haven't there been times when you have seen something go by and you wished that you had captured it to a disk file? Well, the program has a clipboard feature that allows you to cut a section of received info and save it or paste info from your system for re-transmission. This is a welcome addition to any program where you have the ability to save what you want on the spur of the moment or insert anything at the appropriate time.

Transferring files between PkGOLD users is rather enjoyable. The "GOLD" mode allows for the transfer of files while still being able to communicate from keyboard to keyboard. The package also supports YAPP, TEXT and RAW modes. One mode that I have tried myself has been the YMODEM-g mode using regular comm software. The mode works providing the channel is not too crowded. Necessity is the mother of invention and experimentation.

The program also has the ability to run dual ports, if your TNC is a dual port model. That can get to be more interesting. That is from the standpoint where, if one port gets busy, two ports can be even worse. At least for the keyboard user when he is juggling many conversations on both ports.

To sum up, I like the program. I like it very much for what it is. The program removes the operator from the maintenance end of operating a TNC to the user end. It makes the mode more enjoyable for all concerned since the program was written with the user in mind.

A NASTY NEW DEVELOPMENT

I am now on internet. My path for mail is "...!elroy.jpl.nasa.gov!swc!owlsnest!richardp". The software installation has been an absolute riot. The software I use to poll the net has documentation that is worse in its grammar structure than my four year old's spoken English. I managed to get the package up and running, in spite of the software's lack of authoritative information regarding the actual setup of the package. Once I had the package running, I found several incompatibilities between the software and my version of UNIX. Once those were addressed, it was time to let the software do it's own thing.

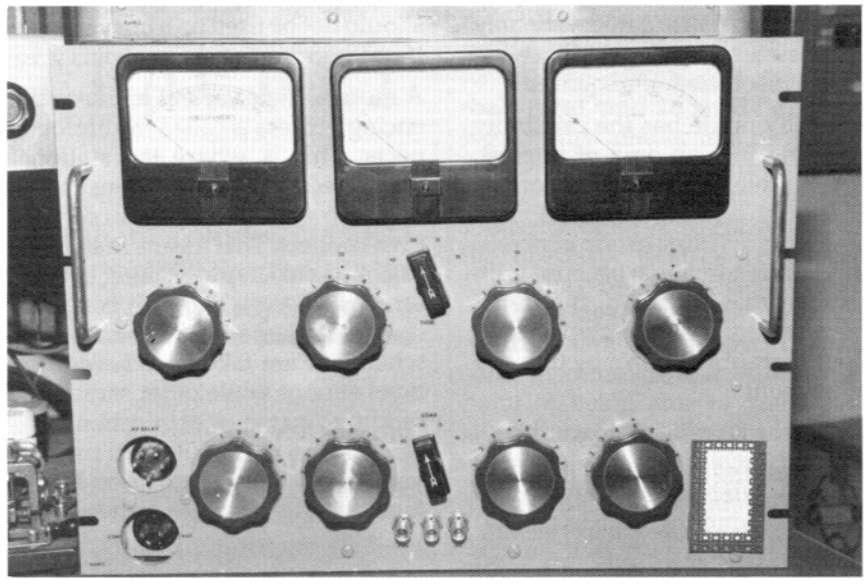
Well, the worst victim of the package has been this article. I have rewritten this article several times because of system crashes that are directly attributable to the network program. The latest outrage involved the /tmp directory. My /tmp directory is maintained in a RAMDISK of 1.5 MB in size. Well, a gripe file was built that ate up the /tmp directory's free space. That also took away any free room that I needed to write this article. The lockup was so complete, that I had to punch the "big red button" and let the system reboot. Once I found the errant line, I rewrote it. I still can't for the life of me figure out the rationale behind their coding, but once I fixed the system dependencies problems, it has been working like clockwork. Now to get a faster machine to handle the interrupts quicker and prevent any port overruns that could occur.

The system here is automatic. This may end up being a great project and of much use. The information that is on the internet, even the articles in the "junk" category are better and more informative than the ones I see addressed to "ALLUS" on the packet BBS systems.

Until next month, keep the deviation down, radios on frequency and use them. What you do not use, you lose. de **Richard, N6NKO** mail: n6nko@wb6ymh-2 or ...!elroy.jpl.nasa.gov!swc!owlsnest!richardp

1KW RTTY AMP DESIGN
Homebrewed

by Carl, K6WZ[1]



I always thought it would be nice to have a no-tune amplifier during the RTTY contests to overcome band change inertia and spice up the proceedings. With the store-bought amplifiers ranging in price up to six kilobucks, the choice between commercially built and homebrew becomes easy.

Almost everything in the amplifier pictured was acquired from other Hams or surplus outlets, all at better than reasonable prices. Some items were dirt cheap, such as meters for a dollar each, perforated aluminum for $2/pound, new knobs for $.75 each. The knobs had no skirts so I made some with a hole saw and a sheet of plastic. The oversized used blower has been changed, however, to a new Dayton 4C440, much more quiet , 60 CFM. It develops 54 CFM at 0.2 inch static pressure. Eimac specifies 13 CFM at 0.2 inch Static pressure.[2]

The amplifier is a conventional cathode driven or grounded grid unit using a pair of 3-500Z tubes mounted in Eimac SK- 410 air sockets and equipped with SK-406 chimneys. It covers four bands, 10 thru 40 meters with any of the four pre-tuned pi network tanks selected by two ganged WWII surplus switches having 1/4 inch contacts. Coils fro each band are connected between tune and load capacitors via ceramic feed-thru insulators. Loading capacitors are under the chassis.

Several years ago I found ten Johnson "E" or "F" series capacitors in surplus and was able to mount five pairs side by side on a 19 inch panel for five bands. Preparing to relocate, I let someone else finish the job. This time the wider "D" series capacitors were acquired - three of them - with a fourth supplied by Jay, WS7I, your friendly Hardware Editor. Three of the capacitors were 150pf units as installed in the 40 meter position. The 15 meter tuning capacitor is 70pf unchanged. In view of the conditions expected for the next few years, serious confederation was given to making the coverage 15 thru 80 meters. This might have been the wiser choice but a 3-1000Z amplifier is on line when needed.

Loading capacitors under the chassis are isolated fro RF by a partition and only the back section of the chassis is pressurized by the blower. All wiring, front to back, is shielded Teflon by-passed with .001 uF disc ceramic capacitors at each end. There has been no sign of RFI or instability.

Basic circuitry is similar to the schematic given in the Eimac Technical Data for the 3-500Z except for a few additions to be described and for a 7.5 volt Zener in the filament transformer center tap which permits using anode voltage in excess of 2500 colts. I normally operate at about 3000 clots (HV supply has a Variac). Pile-up power output available is about 1200 watts but in the interest of longevity, output is usually limited to 600-800 watts. A detailed construction article is given in the 22nd edition of the Radio Handbook, pp. 22.19-22.27. The schematic is about the same as the Eimac sheet. Lateral cooling is employed (no chimneys) and no Zener bias.

The meters read grid current, plate current and relative (un-calibrated) output. The latter is connected to indicate exciter output them operating barefoot. The three panel switches are Radio Shack 275-671 illuminated. The leftmost switch enables the blower alone, permitting cool down

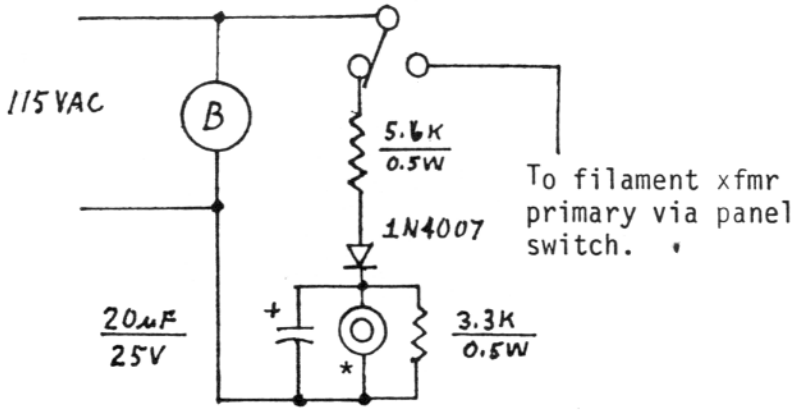


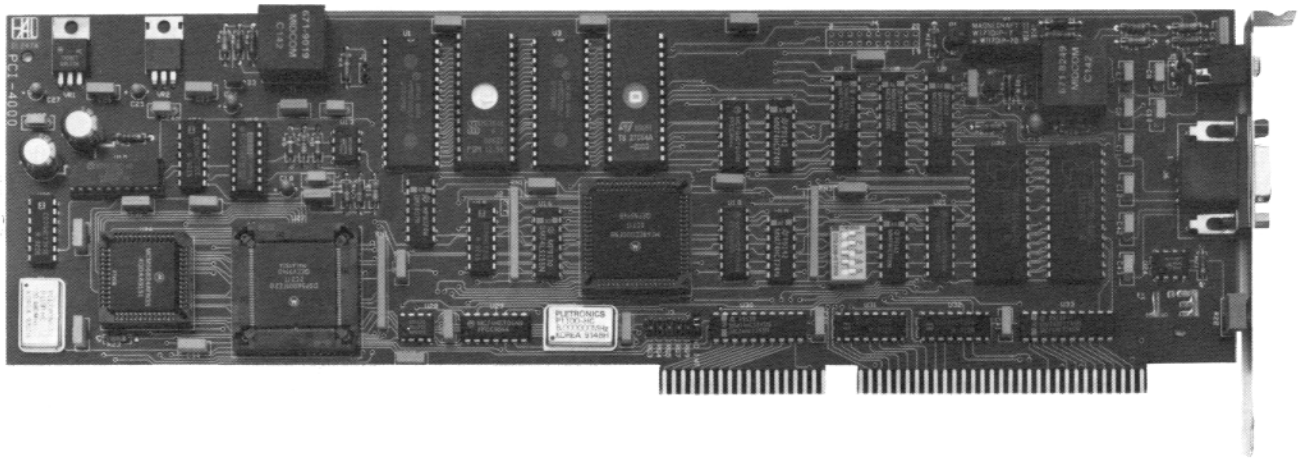
Figure 1

Air switch and alarm circuitry.
* Beeper is All Electronics SBZ-430. Switch: SMS-256.

NEW!

HAL Announces the PCI-4000 PC-CLOVER System

For Fast, Bandwidth-Efficient HF Data



The PCI-4000 uses the latest development in HF data transfer methods–CLOVER-II. CLOVER-II is designed to maximize the amount of data which can be transferred in a narrow bandwidth over HF radio frequencies. It uses a combination of four tone frequencies with phase and amplitude modulation to achieve data transfer rates as high as 60 characters per second–about ten times faster than AMTOR. The PC-CLOVER system incorporates Reed-Solomon error correction, not simply a retransmission scheme. The PCI-4000 is a full-sized PC card which operates in a 80286-based PC or higher.

The PCI-4000 PC CLOVER system features:

- Higher throughput than RTTY, AMTOR, Packet, or PACTOR on similar HF channel
- Simple pull-down menu operation
- Signal bandwidth of 500 Hz (@50 dB down)
- Plugs into your PC (286, 386SX, 386, or 486 machines)
- Easy interface to your transceiver
- Automatically adapts to HF band conditions
- Error correcting using Reed-Solomon error correction

You've read about it in the articles. Now you can operate CLOVER!
Order your PC-CLOVER system today from HAL Communications Corp.

PCI-4000 PC-CLOVER System Only $995.00

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Urbana, IL 61801
Phone (217) 367-7373
FAX (217) 367-1701

MasterCard

VISA

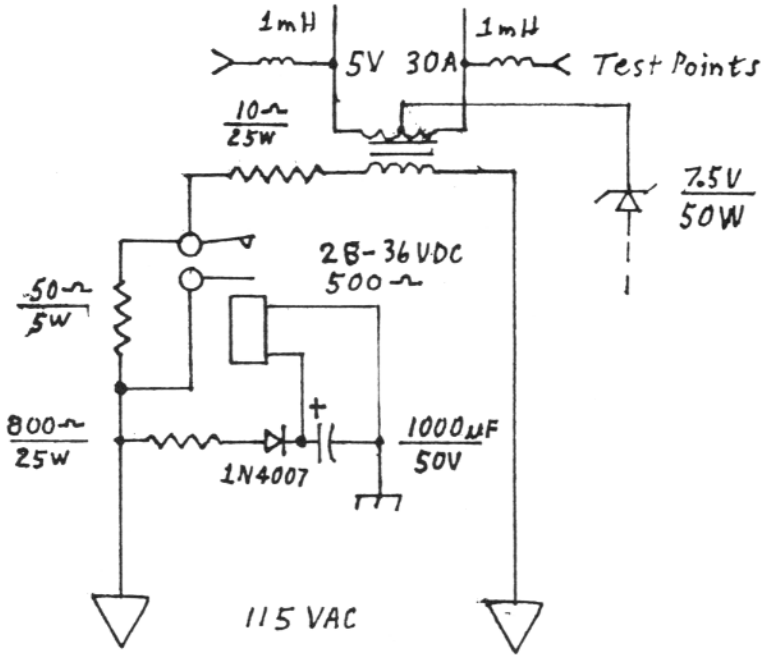


Figure 2

Filament step-start relay circuit.

without filaments. The blower air stream deflects the vane on a 1.5 inch lever attached to a snap-action "sir-switch." the normally open section of the SPDT air switch closes with blower operation, enabling filament transformer operation via the center panel switch. Should the blower wiring, the motor or the internal thermal switch open, the normally closed air-switch contact activates a beeper similar to a Mallory Sonalert (Fig. 1) and removes filament voltage.

The center panel switch controls 115Vac supply tot he filament transformer via a "step-start" relay (Fig. 2). Eimac recommends the inrush filament current be limited to twice normal at turn-on. In the step-start circuit, closure of the relay is delayed momentarily while the capacitor across the coil charges. During the charging period, voltage supplied to the transformer primary is reduced by the resistor across the relay contacts. The third panel switch activates a 24Vdc supply and high voltage by way of a relay and remote line to the HV power supply. This circuit is also under control of the air-switch.

It should be standard operating procedure for anyone planning an amplifier project to study precautions against oscillations as described by Richard Measures, AG6K in QST for September and October, 1990 and to obtain one of the kits he supplies at reasonable cost. The only preventive element on his design incorporated in this amplifier is the "hairpin" choke installed in each anode lead. In some amplifiers, the lead from blocking capacitor to RF choke can be a culprit. The blocking capacitor in this case, however, is mounted directed on top of the RF choke. thus eliminating one potential source of trouble. The parasitic chokes are made of nichrome wire for low "Q" at VHF, following dimensions given in the kit, soldered to 3 watt resistors. Two protective elements were installed which are designed to save tubes and other components from destruction in the event of a large scale transient oscillation: one consists of a 10 ohm 10 watt resistor connected at the base of the anode RF choke -- a fuse resistor in effect. Other fuse-resistors are in the form of 30 ohm 1/2 watt metal film resistors. One of each is connected from one grid terminal to ground. RF is bypassed via an 820pF capacitor from each of the six grid terminals to ground.

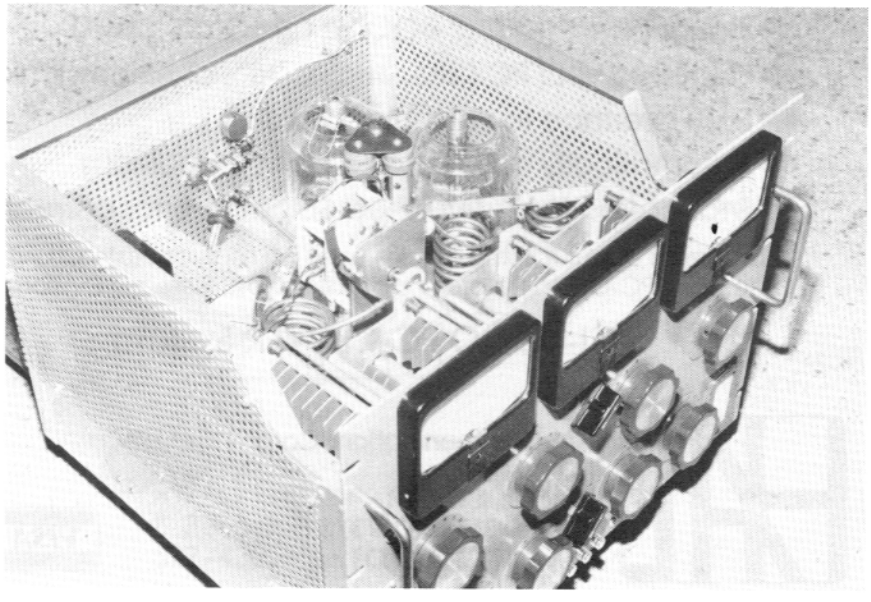
Pin jacks mounted of the side of the chassis are connected through RF chokes to filament terminals. These allow checking filament voltage under full load. High voltage can seriously shorten tube life. In this case, the voltage was a bit over the 5 volt nominal. Adding a 10 ohm, 25 watt resistor in the primary brought the voltage down to a fraction under 5 volts.

No, a no-tune amp won't assure bigger scores or offer a new way to catch up with JA1ACB's DXCC standing, but the fun factor is improved.

Gl de **Carl, K6WZ** ■

1. Carl Steavenson, 535 S. 5th St. Herington, KS 67449

2. Some say that ... for key-down service, air flow should be just shy of that required to blow the tube out of it's socket.



HAREWARE

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

Greetings from the Pacific Northwest where once again winter has settled in with the first brief snow of the year. This months mailbag was quite light so I guess that there aren't many problems out there.

Phil, KC4ZEN writes, I have an AMTOR problem with my DSP-2232. When I connect to some PK-232s that have 1991 firmware in them, the link goes to all errors when the first changeover occurs. Either one of us can call the other and the link works fine until the changeover. One station I have problems with is U5WF on 14.075. I can talk to this one just fine with 1990 firmware in his PK-232, but not 1991. I would really like to hear what happens when someone else with a DSP-2232 tries to connect to him. The selcal is UUWF and the MBO is on most of the time. I connect and idle with no errors. When the MBO forces the changeover, the link goes to all errors. You can leave a message there for me (KC4ZEN) or Victor (UB5WE) or just send mail to me if you have any results to report.

Can anybody give Phil a helping hand?

Second note is from Chris WO1V/VE5CRI who is running solar powered and looking to conserve power drain from his system which he has running 24 hours a day on AMTOR "watch." He is running a TU470 and a CP1. First thing would be to make sure the loop supply is turned off on the TU470. Chris asks about running a TNC without the computer and YES Chris that is the way they can work. Since most modern multi-modes have a computer and RAM (random access memory) storage they can store up to 32K of data and then you can grab it. You have to watch the programs a bit and get them setup so they don't initialize the TNC when you fire up the computer or read messages.

Chris has done a lot of research on the various units and reached some good conclusions on the power drain of each. Looks like the KAM that he mentions fits the need just about right. As to computers, there are a bunch that are available in the 8088 configuration and I would be very interested in hearing more about them from you the readers. In particular I am looking for one with a full slot. I believe the PCI3000 that I just purchased would make a nice DXpedition unit.

This month I am going to focus on a bunch of little bits and pieces and I have several new items that have just arrived and I will detail the schedule of their examination.

First, from Antares Computer Services, 260 Mesa Rd, Nipomo, CA 93444-9309 805.929.2377 are a bunch of new HAM-SERIES computer systems that sound pretty nice. They are primarily for PacketCluster work and you can even get them with or without software. But from the flier I received it looks like a pretty good outfit for those who need a helping hand from a ham outfit. Prices looked fairly competitive to me and each was selected and tested by hams for radio use. Give Bill, WA6IET a call for more information if you are interested.

Received a nice progress report from Bill Henry, and Ray Petit on the PCI 4000 and Clover II. It should be shipping as you read this. Like all DSP projects of this sort, delays and longer than expected cycles, will become a part of life. Bill, relates that results are encouraging with CLOVER-II reliable passing error-corrected data on HF radio at rates between 10 and 60 bytes per second. This is a factor of 1.5 to 10 times factor than AMTOR, PACTOR, or HF packet. Typically the rate has been 20 to 40 BPS. An interesting note is that software changes are downloaded from the computer so that software revisions do not require changing EPROM integrated circuits. Hal Communications like a lot of our other manufactures now have a BBS for software updates and support.

Rumor has it that software developers are being solicited by HAL, so if you are looking for an exciting end-user project contact them direct. The PCI 4000 is in the $995 price category.

PAC COMM 9600 BAUD

Well the big news this month is the hardware has arrived that I have been waiting for from two manufactures arrived. First into the shack were the PacComm 9600 baud packet units. I received a IPR-NB96 which is a combined 9600 baud modem, TINY-2 TNC and a 440 RF transceiver. This is the stand alone modem which serves as a switching center. It has front panel push button selection of four (4) modems. The TNC's 1200 bps AFSK modem, the 9600 DFM modem or either of two other modems such as PSK or a disconnect header modem.

The RF unit is the TEKK KS-900 data transceiver which is crystal controlled and is rated at 2 watts at 9.6 volts with a 0.35 dB SINAD sensitivity.

The second unit was the DT-NB96 which is the digital transceiver with a 9600 baud modem and the same RF components as above. It interfaces with most existing modems.

The plan is to do a complete node at the local EWARG (Eastern Washington Amateur Radio Group) packet-cluster site with the IPR and hook up the data transceiver to the DRSI port which I currently use to run the cluster. It is currently hooked up to a 300 baud external modem.

AEA DSP 1232 & 2232

The second big bunch of stuff that arrived was one each of the PK1232 and the PK2232 the DSP modems from AEA. We have been most excited to get a look at these since assisting the local AEA dealer on setting up his PK2232 several weeks ago. The plan here is to do an extensive review of both units over a period of several months. This will be on the hardware level and not the user software level.

Hopefully the RTTY Journal's software editor can take a look in the future at various pieces of software that run the units on the user level. Last months Journal details the specifications of the two AEA units.

One of the things I will be doing is running 9600 baud packet to some of the above mentioned nodes that I will be establishing on 440 packet here in the Spokane area. We will also try several of the HF modems that are available on the units to include AMTOR and RTTY.

This past weekend while in the Seattle area at one of the major Ham stores I saw that AEA also has a frequency read-out for the Isoloop antenna that I just finished reviewing. This should help with the tuning of the unit and is a great example of a manufacturer reacting to the requests of the customer.

The Yaesu FT-1000D

This month I am going to look at an exciting piece of hardware which I just acquired and have been using for a couple of months. It has been years and years since I got my first ICOM 751 and I have used them pretty much exclusively on the digital modes for about 10 years. This year Betsy (my XYL) bought me a new Yaesu FT- 1000D. This is the dual receiver rig with all the bells and whistles. And with the price tag its a good thing that you don't need to buy much else. Price class around $3,500.

It is a simply outstanding radio on the digital modes and the most fun I have had in years with a radio. It has dual hookups on the back using DIN type plugs for RTTY and for Packet. You can have both hooked up all the time which is pretty slick. Yaesu has a unique way of doing FSK and it doesn't care if you feed the radio FSK or just AFSK it deals with it in a similar manner and calls it shift. This makes interfacing to a lot of existing stuff very simple. Also it takes the pain out of thinking!

It can use all filters in the RTTY and the Packet modes which are two separate dial selection positions. On the air it works flawlessly which is what you would expect from a radio in this price range. The only complaint that I find is the lack of ability to run a filter in the sub-receiver on RTTY. You can run a 600 Hz CW filter and it explains how to calculate the shift but seems awkward to say the least. However, split operation is a dream and you can listen on your transmit frequency as well as the DX frequency. It makes pileups a lot of fun. In fact even if it's not a country you need it's still fun to find the splits and listen to the roar and howl of the signals.

Switching on AMTOR works quite well and the 200 watt level is a great feature as well with the automatic tuner.

Perhaps the neatest thing is being able to listen to RTTY conversations printing on the screen on one receiver and a net on the other receiver. I can sit in a MARS net while copying the mail down on the RTTY band, now that is pretty slick.

I have the computer-radio interface all hooked up and must say that I have been having problems with the CT program. Haven't yet solved that but expect that I shall in the near future. Unlike some companies, Yaesu seems to have outstanding service and I highly recommend both the company and the radio. We now have several in the local area running the FT1000s. Jim, WB7AVD is another happy camper.

Rumors

Well this month I have heard from several sources that at least two of the Multi-mode companies are coming out with PACTOR software for their multi-mode modems. I haven't seen any yet, but think that before the next Journal arrives some early versions will be on the street. It is indeed an interesting time in the digital world.

A little bird told me that Hal, WA7EGA is alive and well in Spangle and has a new version of the infamous Scotchlog and indeed I have one that runs on the Kantronics KAM.

There also looks to be a new group forming in the FidoNet ranks that will specialize in Digital information. Your local BBS operator may have more information on that.

That's all, this month from the shack of WS7I, where I continue making cables for all the new hardware. If you have experiences with the AEA DSP 2232 and/or DSP 1232 drop me a note. I would also like to hear from those that are into 9600 baud packet using the PacComm boards. Next month I will detail 9600 baud packet and look at setting up the PacComm 9600 IPR and DT on UHF.

73,de **Jay, Ws7i** ■

WS7I @ WS7I.WA.USA.NA FidoNet 346/3.0 InterNet jayt@comtch.spk.wa.usa PO Box 644 Spokane, WA 99210-0644

Have you secured a room for Dayton 93 yet?

OH2AG Celebrates

Tapani, OH2LU, reports on their club effort in the 1992 CQ/RJ RTTY Contest held over the weekend of September 26-27. Since the early 60's the local IBM company employees have enjoyed a somewhat active Ham Radio club. To celebrate their 30 years of existence, the Club decided to participate in the CQ/RJ RTTY Contest. The picture on the front cover taken by Timo, OH2HF (Club Chairman), shows the team in action during the contest. This first time effort accounted for 652 QSOs, with 333 multipliers, for a grand total of 557,775 points. This outstanding first time performance was accomplished in 32 hours of operation leaving enough time for other appropriate means of celebrating their 30 history.

The gear used consisted of the following: Drake 7 line, KAM TNC and IBM PS/2 computers. Antennas were the TH6DXX and switchable slopers for 40 and 80 meter bands supported by a 22 meter tower.

PACTOR for the KAM

A Preview
by Phil Anderson, W0XI [1]

PACTOR is an HF data mode, designed to adapt to the vulgarities of the ionosphere. The name PACTOR is derived from two other popular HF modes, Packet and AMTOR, because it combines some of the best features of both to provide an error free method of transmitting data on HF.

PACTOR signaling uses an ARQ protocol, like the AMTOR mode, to establish a link between stations and synchronize them. The ARQ protocol makes callsign overhead with each frame unnecessary. Most importantly, PACTOR strengthens the error correcting nature of ARQ by utilizing a cyclical redundancy check (CRC) process to provide a robust, error-free HF data link.

PACTOR enables higher HF data rates. Channel capacity is put to better use by adjusting system Baud rates automatically to HF channel conditions. Greater throughput is also achieved by using Huffman data compression on-the-fly. Further, a process called "Memory-ARQ" combines repeated received frames to form a good frame, often making repeats "until perfect" unnecessary under weak signal conditions.

The PACTOR data format is a frame, like Packet, consisting of a header, a data field, one status byte and a two-byte error correction code (CRC). Frame transmitted at 200 Baud contain 20 data bytes, frames at 100 Baud 8 bytes. Hence, PACTOR frames are longer than AMTOR but shorter than Packet frames, resulting in a good transmission duration for HF at 1.25 seconds.

In summary, the features of PACTOR are:

- Operates error free, using a CRC process
- Provides both linked and broadcast modes, ARQ and FEC
- Automatically sets transmission rate, 200 or 100 Baud
- Utilizes parts of repeated frames to make up good frames called Memory-ARQ
- Compresses data automatically, when helpful, using a Huffman code, (may be turned off)
- Allows transmission of full ASCII character set
- Provides PACTOR Listen mode
- Provides for long-path links
- Allows o character identifier, callsigns or MARS calls

Key Operational Characteristics:

Faster Baud rates than AMTOR

Automatic Baud rate change, hence a better match to band conditions than other modes

- CRC error checking, hence more accurate than AMTOR
- On-the-fly data compression, selected when throughput would be increased
- Limited overhead bytes in the data frame
- Limited duration for any given frame (1.25 seconds)
- Transmitter-Receiver time synchronized, all leading to a more robust HF data transmission mode

KAM PACTOR commands, twelve in all:

PACTOR, MYPTCALL, PTLISTEN, PTFECSPD, PTHUFF, PTERRS, PTRPT, PTDOWN, PTUP, PTTRIES, PRSI, PTSUM

The optional PACTOR EPROM for the KAM implements the protocol and adds twelve commands and five directives. CQ and specific station linking are imitated by using the PACTOR command. To link with WK5M for example, just type PACTOR WK5M at the Cmd: prompt. PTListen sets the KAM in PACTOR listen mode. The remaining commands are used to set parameters. Directives are two-key commands used during operation to do such things as seize the link or abort the link. For example, to seize the link type
T. Simultaneous VHF Packet operation is still supported.

Programmable Mark/Space Filters Allow PACTOR Matchup

The PTC unit, made by SCS of Germany in 1991, was the first PACTOR unit to exist. Mark and Space tones were selected to be 1200 and 1400 Hertz. Since the KAM has programmable Mark and Space filters, no hardware changes were necessary in order to accommodate PACTOR. Using the SHIFT, MARK and SPACE commands within the KAM, its Mark and Space filters may (but need not) be set for 1200/1400 by keyboard. Additionally, since the low-pass filter within the HF demodulator is programmable, its bandwidth is reduced during 100 Baud PACTOR, gaining noise margin.

Hence, to implement PACTOR, Kantronics has programed and implemented a new EPROM upgrade called the PACTOR Optional EPROM for the KAM. No additional hardware is necessary.

Tuning PACTOR is straightforward. As with RTTY or AMTOR the KAM bargraph may be used to tune a PACTOR signal. With the KAM in PACTOR mode and the rig in LSB mode, both edges of the bargraph should be lighted to center the received signal. PACTOR has a chirp sound due to its ARQ format, somewhat like AMTOR but a bit longer in duration. Frames transmitted with data last for about 1.25 seconds, easy to recognize and differentiates from Packet and AMTOR.

1. Kantronics, 1202 E. 23rd St., Lawrence, KS 66046

QSL ROUTES

by Betsy, WV7Y

Fall approaches and I missed last month so I have lots of QSL routes this month. Hope everyone enjoyed the new JARL and CQWW RTTY contests as much as I did.

Thanks to DX1, DX2, et al and as always to the Digital folks on the WS7I packetcluster system which is now linked into three states and sometimes the East coast.
73 and 88, de Betsy, WV7Y

3C1EA	QSL via EA4CJA
4L1FJ QSL	via OZ1HPS DIRECT ONLY
4M500V	QSL via YV5KWS
4U1WB	QSL via KK4HD
4U47UN	QSL via W8CZN c/o WB8LFO
4V2PK	QSL via Box 1095, Port Au Prince
5K3V	via HK3GA POB 584 Bogota, Columbia
5U7M	QSL to JARL, Box 377, Tokyo Central, Japan
9A1CRT	QSL via Box 564, 41000 Zagreb, Repcof Ctoatia
A41KB	QSL ON6BY
BY4VU	QSL via W3EVW
C6A/WX5L	QSL via WX5L
C6A/K5KR	QSL via K5KR
C9RJJ	QSL via W8GIO
CN8NP	QSL Frank Patri, C/o American Embassy Rabat, PSC 74 Box 024, APO AE 09718, USA
CO6CG	QSL via HK5LEX
CY0NSM	QSL via VE1CBK
FM/OH2BGD	QSL via CBA
FP5HL	QSL via Box 1107, F97500 St Pierre Et Miquelon
FR5AB	QSL via CBA
GU/DJ6QT	QSL via DJ6QT
GU3HFN	QSL via DJ6QT
HP2CWB	QSL via N4YWY
HZ1AB	QSL via K8PYD
IQ2CC	QSL via I2MQP
JD1AMA	QSL via CBA
JX9EHA	QSL via LA2T
KP2/K2SHL	QSL to K2SHL
OJ0/OH1AF	QSL via OH1NOA
PJ2MI	QSL K2PEQ
RJ7JYZ	QSL via IK3HHX
RY8Y	QSL via UY5EG
S21ZF	QSL G0CMM
S79PDL	QSL via Box 448, Seychelles
SV8/DF3NE	QSL via DF3NR
T32GV	QSL via W6OTC
T32RA	QSL via KN6J
TI9JJP	QSL to TI2AOC
TR8XX	Box 4096, Liberville, Gabon
TZ6VV	via N0BLD
UF6FJ	QSL via OZ1HPS DIRECT ONLY
UW2F	QSL via UL7PCZ
V31RY	QSL to WN0B
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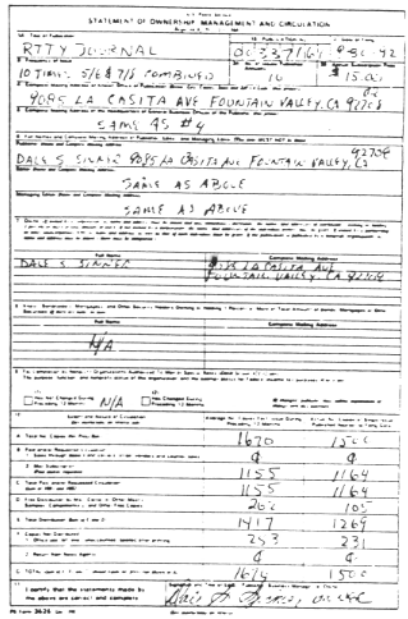
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