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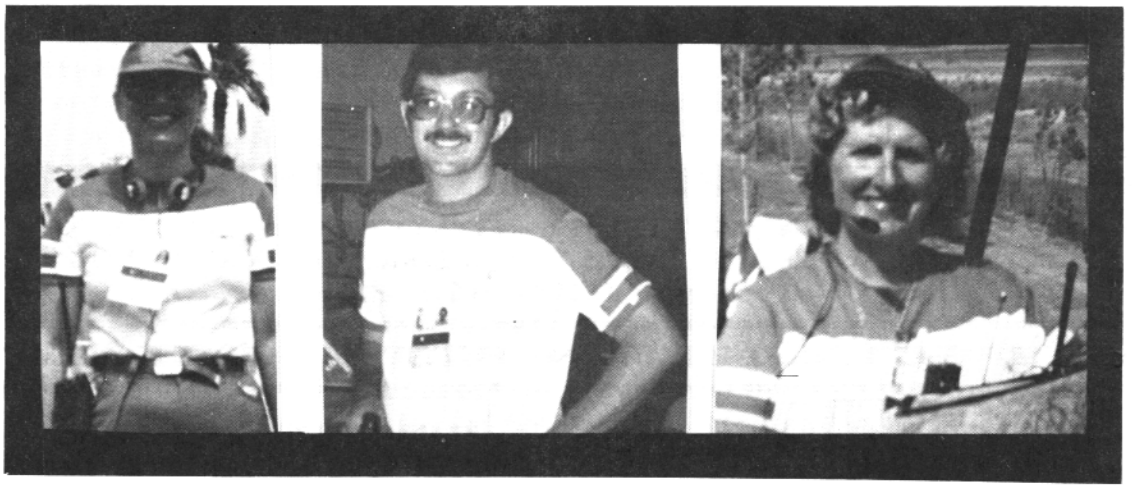

SOME AMATEURS PROUDLY SERVED WITH THE OLYMPIC GAMES

JUDY, WD6BEZ; STEVE, WA2NNT; and DEE, N6ELP

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RTTY JOURNAL

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AMTOR-CONTINUED FROM LAST MONTH

WHAT TRANSCEIVER WILL WORK?

Most people have been overly concerned about whether or not their particular transceiver will work on AMTOR. First, virtually any s.s.b. transceiver will operate on F.E.C. mode. Because of the timing requirements of A.R.Q. mode, it is necessary that your transceiver have reasonably fast transmit-receive switching time and receive recovery time. Ideally, the switching-recovery time should be less than 20 ms. to be able to work your antipods (the other side of the earth). In a practical sense, you will find that if your transceiver is not quite this fast, it is nothing to become alarmed about. You simply will not be able to work stations that are too close or stations beyond a certain distance (determined by how slow your transceiver really is). In this event you have two alternative solutions:

1. Work the close-in or far-off stations on F.E.C. and enjoy A.R.Q. with all others inbetween;
2. Modify your rig (usually a matter of changing a few resistors and/or capacitors).

Keying relays have not been found to be the cause of insufficient switching speed. In fact, I use my Drake L4B with no modifications with an AEA AMT-1 which pulls the PTT (push-to-talk) line low before the r.f. is applied. VK2SG reports that he has been using his Henry 1KD5 on A.R.Q. mode for two years without any relay problems. If anything, the contacts may be enhanced by self-cleaning.

Regardless of the transceiver (or receiver) used for A.R.Q. communications, always be sure to switch your **AGC** to **FAST**, or if necessary, **OFF**. (In the case of the Collins S-line, be sure your transmitter drive is backed off so that you draw **NO ALC** current).

For a list of popular rigs that have been found to operate on A.R.Q. (and F.E.C.) with no modifications, and for an abbreviated list of transceivers requiring simple modifications, write to the author of this article at: P.O.B C2160, Lynwood, WA 98036-0918.

OPERATING

After you have made your selection of an AMTOR terminal unit and have checked it out with your transceiver in accordance with your instruction manual, you are no doubt ready to make that first exciting AMTOR QSO. Presently, most AMTOR activity is on 20 meters, with the international calling frequency being 14.075 kHz. For most North American AMTOR terminal units, Lower Sideband AFSK will be used, which means you will tune your synthesized v.f.o. to a digital display 14.0772 (high tone straddle tuning). European Terminal Units are normally set up for low tones and Upper Sideband AFSK operation. Thus, they would tune for a dial reading of 14.0738 MHz., and both stations would be on the same frequency 14.075.

Before trying to transmit, always monitor the frequency for activity. If you hear a station that is transmitting continuously, but does not sound quite like normal RTTY, chances are it's F.E.C. AMTOR. Make sure your AMTOR terminal unit is in F.E.C. receive mode and try to tune in the signal. It is possible the station is calling CQ; if so he will give his "SELCALL" (Selective Call), which is made up from four of the letters in his call sign (no numbers). As an example, W1ABC's Selcall would be WABC, whereas N7ML's Selcall would be NNML, following the convention of repeating the first letter if the call does not have four letters.

When the F.E.C. station calling CQ stands by for a response, you may choose to answer him in F.E.C. mode if you have not yet checked out your system. This will allow you to alert him that you would like his patience and guidance until you feel safe on new ground. Generally, you will find most AMTOR users only too willing to help another break easily into the AMTOR ranks.

If you are feeling adventurous, go ahead and initiate your contact with the station by going direct to A.R.Q. mode. To do this, you will become the Master station by selecting the 'ARQ CALL' mode on your keyboard (or panel button of the TU) and then type in his four letter Selcall. All of a sudden your transmitter should start chirping away (providing you were properly tuned in on receive), and soon you should hear his transmitter chirping back at you between your transmissions. Now try hitting the return button (carriage-return/line-feed) on your keyboard.

Your AMTOR TU should have an echo feature, which means that your keyboard inputs will not appear on the screen until they have been received correctly by the I.R.S. When you see the data on your CRT scroll up a couple of lines in response to your RETURN commands, you know the other station is copying. Now you should identify with his call and your call followed by +? (which will automatically turn the transmission over to the I.R.S. so that he now becomes the I.S.S. and you the I.R.S.). You should immediately make plans to QSY up or down frequency to the nearest clear channel in order to clear the AMTOR internationally calling frequency. It is standard practice (to make tuning easier) to always QSY up or down into one kHz increment from 14.075. The cleanest way to QSY is for the I.S.S. to pull his tone/PTT cable connector out of the transceiver microphone input jack (or simply turn the r.f. power level down to zero) and quickly tune up and find a clear channel, and then come back to the original frequency and plug in the cable connector (or increase the power level). If you are fast enough, the two stations should still have phase lock. Now the I.S.S. can report to the other station that he will QSY so many kHz up (or down). Each operator should then quickly twist his v.f.o. dial to that frequency (so as not to cause any harmful interference to other stations operating between your original frequency and the new frequency to which you QSY). With practice, you will find this to be a simple maneuver that will only take a few seconds with absolutely no loss of data.

Now you are ready to take part in some real fun - namely, tasting of the sweet AMTOR nectar.

Part three next month....

JOE WOOD, AJØX

POB 84

LAUREL, MS 39440

DX

Hi gang! It sure is good to be here with you again this month. There has been a definate slump in DX activity although the incoming reports would seem to point in the other direction. Thanks go out to each of you that have contributed information for this column. There has been lots of mail and phone calls and believe me, it is appreciated by this writer and I am sure by the readers of this column. With your continued support, I can continue to bring you the kind of information that you can use in your RTTY DX chasing and would like to hear from you if that is not being accomplished. Your input is solicited.

The summer season is just about over. Lots of activities during this period. Family outings, vacations, and last but not least the ever-loved "Hamfest". I was looking at the calendar and for the boys down this way, there are four left. Shreveport, LA, New Orleans, LA and Mobile, AL next month and Biloxi, KS in October. My XYL and I hope to make these and if so will be seeing some of you! I did not see too much in the way of DX mentioned on their programs but there always seems to be a strong contingency of DXers at those get-togethers and I look forward to swapping tales with them.

This month the ARRL will finally start honoring endorsements to its RTTY DXCC. You will remember that last month I mentioned that the RTTY DXCC Honor Roll would not be listed. I don't really know if there are those of you out there that have enough cards to qualify [ED NOTE: last month saw I5FLN, Luciano garner an endorsement for 200 countries all on RTTY, issued by the RTTY JOURNAL, and there are many more RTTYers having totals well above 100]. The CW boys did not have enough to qualify for the Honor Roll either and ARRL saw fit to set the totals up so that the highest number of countries reported would be used to determine the top and then list those stations that were within ten countries of that figure. I strongly feel that they should accord us the same privilege and set up a Honor Roll listing for RTTY. If you feel strongly about this then I suggest that you write a letter indicating your wish to have an Honor Roll set up for RTTY DXCC, directing it to the DXAC representative in your ARRL division, with copies to your division director and Dave Sumner at ARRL Headquarters. Granted, this will take a bit of your time, but this is the only way to get it changed. If enough of us do this then our voice will be heard.

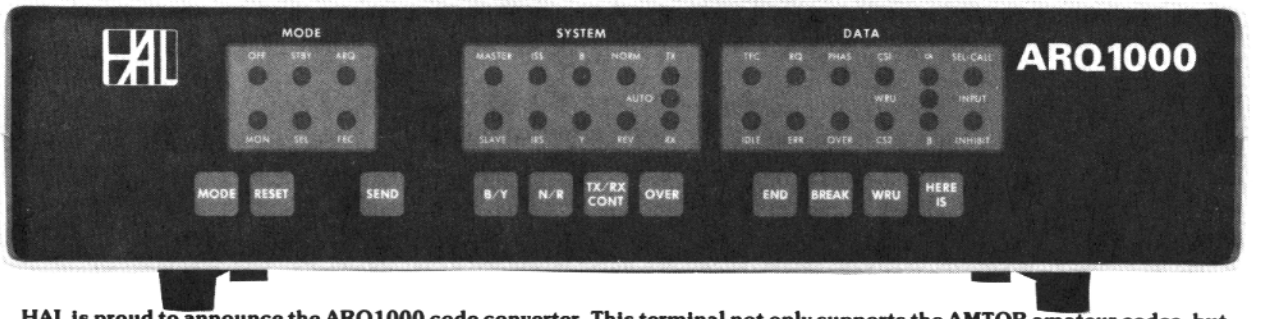
New DX countries...there are over one hundred countries represented on RTTY. Many new ones could be added if the DXpeditions would cooperate and include RTTY as one of their modes. There are a number of reasons that the mode is excluded from these operations and it is going to be a long up-hill battle, but if we ban together perhaps something will be done about this problem. The loudest cry from the DXpeditioners is the slow QSO rate. This can be understood when a group is on a tight schedule and has a limited amount of time to make a maximum number of contacts. Most of the Dxpeditions utilize funds from supporters, the Northern California DX Foundation being one. We can gain some clout if you will join, or perhaps you are already a member of an organization of this type, and insist that any DXpedition requesting funds from that group utilize RTTY as a mode. One DXpedition, just completed, did not do a thing for the RTTY group. This, of course, was the group to Desecheo Island. I would love to have had that one in my log and I'm certain that there are many of you out there that feel the same way. I have always tried to support any group that was going to an out of the way spot to give the world a shot at a new one and have just revised my thinking to include support, only if they operate RTTY. This probably won't mean a thing to them unless we all take that attitude. Harsh yes, but it seems the only bit of leverage that we have at the moment. I would like to hear from you on this and other suggestions you may have for getting the job done.

Last month, I indicated that I would like to hear from anyone having experience using the Icom-751 on FSK, and received a nice letter from Leo, K4AGC, regarding his experiences. Leo did a fine job on this and is in the process of putting something together for an article that I know will show up in the JOURNAL as soon as it gets to Dee [ED NOTE;you bet]. Thanks Leo.

Speaking of receiving mail, I was very pleased upon receiving a cassette tape from Tom, N4FJL. Tom went into great detail on his experiences with Ian, T2ITA (Tom is his QSL manager), a long time friend, consuming about 30 minutes of one side of the cassette. Tom calls this tape, "THE SAGA OF T2ITA" and listening to it, I could not help but believe it would make a great story for the JOURNAL. As soon as I have transcribed it will send to the office.

Continued on page 15

AMTOR RTTY



HAL is proud to announce the ARQ1000 code converter. This terminal not only supports the AMTOR amateur codes, but meets ALL of the commercial requirements of CCIR Recommendation 476-2. The ARQ1000 can be used with present and previous generation HAL RTTY products. In fact, any Baudot or ASCII full duplex terminal at data rates from 45 to 300 baud may be used with the ARQ1000. Some of the outstanding features of the ARQ1000 are:

- Send/receive error-free ARQ, FEC, and SEL-FEC modes
- Automatic listen mode for ARQ, FEC, and SEL-FEC
- Meets commercial requirements of CCIR 476-2
- By-pass mode for normal RTTY without changing cables
- Programmable ARQ access code, SEL-CAL code and WRU
- Programmable codes stored in non-volatile EEPROM
- Keyboard control of normal send/receive functions
- 30 Front panel indicators and 11 control switches
- Interfacing for loop, RS232, or TTL I/O
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- Self-contained with 120/240V, 50/60 Hz power supply
- Cabinet matches style and size of CT2200 and CT2100
- Table or rack mounting
- Built-in DM170 modem option available
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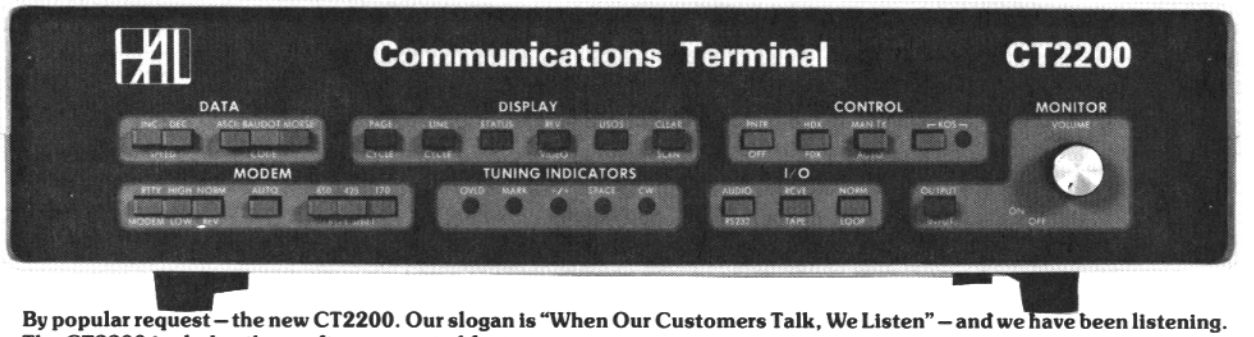
The ARQ1000 is commercial-quality equipment that will give you the outstanding performance you expect from a HAL product. Write for full details and specifications of the ARQ1000.

BY POPULAR REQUEST



By popular request – the new CT2200. Our slogan is "When Our Customers Talk, We Listen" – and we have been listening. The CT2200 includes these often requested features:

- New AMTOR connections for use with ARQ1000
- Keyboard programming of all 8 "brag-tape" messages
- Programmable selective call code
- Expanded HERE IS storage for a total of 88 characters
- Non-volatile storage of HERE IS, "brag-tape," and SEL-CAL code
- $3\frac{5}{8}'' \times 17'' \times 10\frac{1}{2}''$

All of the proven CT2100 features are retained. Some of these features are:
• Tuning scope outputs (a MUST for AMTOR) • Built-in demodulator for high tones, low tones, "103", or "202" modem tones • 36 or 72 character display lines • 2 pages of 72 character lines or 4 pages of 36 character lines • Split screen or full screen display • Baudot or ASCII, 45 to 1200 baud • Full or half duplex • Morse code send/receive at 5 to 99 wpm • Send/receive loop connection • Automatic transmit/receive control (KOS) • Audio, RS232C, or Loop I/O • On-screen tuning and status indicators • Clearly labeled front panel switches, not obscure keyboard key combinations • Separate convenient lap-size keyboard • Internal 120/240, 50/60 Hz power supply • Attractive shielded metal cabinet

In addition, an update kit is available so that all CT2100 owners can update their CT2100's to include CT2200 features. The kit even includes a new CT2200 front panel! Rather than making a proven product obsolete, HAL put even more behind the buttons. Pick up a CT2200 at your favorite HAL dealer and join the RTTY fun. Write for our full RTTY catalog.

HAL COMMUNICATIONS CORP.
Box 365
Urbana, IL 61801 (217) 367-7373

THE RTTY SERIES OF RADIO TELETYPE PROGRAMS FOR THE HEATH/ZENITH COMPUTERS

Ben Grokett, KR6E
853 N. Alexandria
Hollywood, CA 90029

Every once in a while an individual will come along who is both talented and motivated enough to produce an item that becomes the standard in its field. Perry Taylor, WØSE/8 has successfully done this with his series of RTTY programs designed to run on the H-8, H89, and Z-100 series of Heath/Zenith computers. These programs are virtually identical except for a few hardware dependent changes peculiar to the computer they are designed to run on. In this article I will refer to the Z-100 RTY.EXE program that incorporates high resolution color graphics, but all versions of the program are essentially the same with regard to their communications capability.

For a long time there has been a group of Heathkit computer owners operating on 14.082500 MHz (carrier frequency) using the now famous IMH series of computer RTTY programs by Irv Hoff, W6FFC. This series of programs went through a long sequence of development and are considered among the most sophisticated of RTTY programs. Among the many features of Irv's programs are remote loading capability of directly executable files, the ability to send a full ASCII character set while in 5 level Baudot, and extensive relay capability using remote user commands. Amateurs have enjoyed using this group of programs over the years but, until recently there was no comprehensive single program that included all the features of the IMH series.

Taylor has combined all the fine features of the IMH programs and included some additional ideas of his own. With the help of suggestions from the 14.082500 group, Taylor has written a comprehensive package of programs he calls the RTY series. These programs have virtually all the features even the most sophisticated RTTY operator would be happy using on the air. The program leans toward the high frequency operation for reasons I will explain later but, some of the features of RTY are adjustable split screen; 3rd and 4th level Baudot which allows upper and lower case ASCII to be sent using Baudot; relay capability; extensive format versatility; full color assignment to incoming text, outgoing buffer, and transmitted text; screen saver ability; full disk and file control; access to the system directory; and perhaps the best feature of all, it's completely free, having been placed in the public domain by Taylor for the enjoyment of all Amateurs who want to use the program.

The program has an easy configuration that can be accomplished in seconds. The configuration requires information such as the time and date, call, baud rate, code (Baudot or ASCII), programmable strings, disk operations mode, color assignment, and format options. Once entered, these parameters are retained in a configuration file that is called up each time the program is loaded in the future.

One of the nice features of RTY is its format versatility. For example, it is nice to be able to send a 20 column format to a user of a VIC-20 and have his received text be fully justified for his line length. RTY allows the user to set any column length he wishes to use. There are many operators who are confined to non-standard formats and needless to say, this capability makes their copy much easier to read! Another interesting format feature of RTY is full control of the left hand margin. An example of this would be when sending a note to a friend on a autostart channel. The user of RTY could enter his friends call for sending at the beginning of each line of text. The call would be inserted automatically at the beginning of each line. When using RTY there is no need to be concerned with manual carriage returns or line feeds since this is all accomplished by the program including the insertion of left margin text. This allows for an individualized transmission of text that will stand-out among all other traffic on a channel. RTY also includes a picture mode (bare carriage return) for those who might want to send files with overlays. I might add at this point that RTY automatically identifies itself every ten minutes and some of the picture crowd don't care for the way RTY breaks for identification sequence. I have been told this problem might be remedied in future versions of the program. It would be a relatively simple procedure (while in picture mode) to key a line set up for low frequency identification out of the passband of most terminal units. This would allow identification to occur without interruption of normal RTTY transmission format.

One of the cute features of the Z-100 version of RTY is a graphics representation of the well known cross pattern of an RTTY signal while in the receive mode. This pattern is shown in the upper right corner of the screen and it changes with the incoming characters as they are received by the program. During transmission, a small house with a tower and beam appear with the beam appropriately radiating RF!

Taylors' program is the first RTTY program I have seen that uses a screen saver feature. Many operators who use computer programs for RTTY will often leave their systems running 24 hours a day. This can have a detrimental effect on displays, causing them to develop burn spots in some instances. With RTY don't worry about burn spots because the output to the CRT is blanked after several minutes of no activity. The first time I used the program I thought my system had crashed because after turning away from the console for a moment, the screen was completely blank without even the cursor showing! However, after hitting the space bar the display was instantly back to normal.

RTY has a sophisticated WRU capability. In addition to providing the time, date and call letters, RTY will also indicate to the remote user what status or mode it is in. For example, it is possible to selectively turn

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FL44A	2.1 KHz	0.455
FL52A	500 Hz	0.455
FL54	250 Hz	0.455

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7451283

off the relay mode of the program, and if this is the case the WRU will indicate this to the remote station. Disk mode status is also sent in the WRU sequence, indicating to the remote station whether disk copy is taking place.

The Z-100 version of RTY allows the assignment of color to three basic sections of text. Those sections are the transmit buffer, incoming text, and outgoing text. In my system, I have assigned yellow to the transmit buffer, green to incoming text, and red to outgoing text. Needless to say, high resolution color adds a whole new dimension to RTTY operation and makes sections of text instantly identifiable.

RTY is very easy to use. By pushing the help key an entire menu of functions appears, so aid to the new user is just a key away at all times. Sometimes a configuration parameter needs to be changed while in the midle of a transmission. No problem, RTY allows the soft change while retaining all permanent parameters in the configuration file.

As mentioned before RTY was designed with high frequency performance being a top priority. Over the years our little group on 14.082500 has been able to successfully communicate with others on channel who might be geographically located outside of the normal skip zone found on 20 meters at any given time. An example of this would be when I am attempting to talk with W6FFC in the San Francisco Bay Area, from my QTH in Hollywood, California. The distance between us ia about 450 miles, which is just a bit too short for reliable 20 meter communications to take place. The answer to this problem is to use a relay station located in the midwest. RTY has full relay capability and by simply satisfying the command requirements of the remote relay successful communications can take place between two stations who are located in a dead zone.

Disk operations with RTY are simple and versatile. RTY allows the user the option of copying received text only, transmitted text only, transmitted and received text, or none. While in RTY the mode can be changed with the stroke of a few control keys. Disk files are automatically written to disk for unattended operation, however the user can force a manual write whenever necessary, such as when copying a specific block of text that requires the file end at a particular point. Consecutive files are differentiated from each other by their extent. For example, over a period of 24 hours, there might be 3 files written to disk by RTY. The file names might be:RTTYCOPY.AAA, RTTYCOPY.AAB, AND RTTYCOPY.AAC where the only difference in file names would be the alphabetic progression of the extent. Some users of RTY like to assign a date name to their copy files. In such a case, the file names might look like this: MAY5-84.AAA, MAY5-84.AAB, and MAY5-84.AAC. This allows the user to identify a specific file among many if he has a number of copy files on disk.

RTY will allow a user to toggle a printer on or off for hard copy during operation. The configuration procedure provides for the user to set up his printer parameters with all standard baud rates and handshaking methods possible. These parameters are stored permanently in the configuration file and never need be changed again unless the user wants to use a different printer for their RTTY setup.

The hardware requirements to run any of the RTY versions is simple. As mentioned before, any of the Heath/Zenith computers will run the program, and any terminal unit can be made to send signals to the computer system. All communications occur across a standard RS-232 port so no auxiliary interface of any kind is required to run the program. Most terminal units manufactured today already have RS-232 levels available, or it can be added to terminal units like the ST-6 with the addition of a few resistors, diodes, and a couple of switching transistors. Therefore, you are not locked into a particular type of interface that may or may not be adequate to good HF communication.

Here are some of the control features of RTY:

CTRL-x means key x, while holding down the CONTROL key

PROGRAM CONTROL:
CTRL-A- Play string "A"
CTRL-B- Play "bell"
CTRL-C- Enter twice to return to ZDOS
CTRL-D- Toggle disk input to transmit ON/OFF
CTRL-E- Play string "B"
CTRL-F- Replay previous/manual (ZR)
CTRL-G- Go to receive after 4 N's (or "-BK-" fast-bk)
CTRL-K- Kill transmit immediately
CTRL-L Call up left margin characters
CTRL-M- Same as return key
CTRL-N- Play identification
CTRL-R- Play RYRY (U*U* in ASCII)
CTRL-T- Play time/date
CTRL-V- Go to receive mode without 4 N's
CTRL-W- Force DISK COPY write
CTRL-X- Go to send mode after 32 (or 4 fast-bk) DIDDLES
CTRL-Y- Toggle disk copy ON/OFF
ESC RETURN- Send bare CR (PIX ONLY)

Speeds:
f2 key or ESC T - 45.45 baud (Baudot 60 WPM)
f3 key or ESC U - 50 baud (Baudot 67 WPM)
f4 key or ESC V - 74.2 baud (Baudot 100 WPM)
f5 key or ESC W - 110 baud (ASCII 100 WPM)

FUNCTION KEYS:

f0 key - Toggle FAST BREAKIN mode ON/OFF
f1 key - Toggle CONFIGURE mode ON/OFF
f2-f5 - set SPEED
f6 key - Toggle RELAY mode ON/OFF
f7 Key - Toggle 3/4 level receive ON/OFF
f8 key - Enter fname.ext for disk input for sending
f9 key - Force RELAY MODE copy (manual ZC)
f10 key - Clear transmit buffer
f11 key - Clear printer buffer
f12 key - Play Quick Brown Fox.....

The program will respond to the following incoming commands, if preceeded by either a CR or LF.
Continued on page 11

ENGINEERING MAKES THE DIFFERENCE

Production Expertise And Service Integrity Form The Foundation For Your Long-Term Satisfaction

The fact that the Computer Patch Interface unit by Advanced Electronic Applications, Inc. is known as the best value on the market is no accident. The CP-1 was designed by Al Chandler, K6RFK (PHD-E.E.), an active RTTY user since 1963.

Given a cost per unit budget for the CP-1, Al designed as much performance as possible into the Computer Patch, including a unique new tuning indicator, referred to by one of our customers as the "Dead Eye Dick" tuning indicator. This indicator is ideal for RTTY and CW, in that it is both fast to tune and (within 10 Hz) as accurate as scope tuning. It also performs under poor signal to noise conditions in which other indicators provide no useful data.

Al's variable shift tuning was designed to move the space filter center frequency from 2225 Hz to 3125 Hz without changing the bandwidth (by varying the Q of the filter). All this is accomplished using a precision ganged potentiometer to assure proper tracking of the multiple filter stages. We could have used a pot costing a tenth as much by simply using a two-pole filter design, but we feel the advantage of a sharper filter reduces the noise bandwidth significantly and allows the variable shift control to be used like passband tuning for extra elimination of adjacent channel interference.

Some manufacturers are concerned that amateurs might try calibrating their own equipment and, therefore, have used non-adjustable components, which results in sub-optimal performance. Although more costly, trimpots used in AEA equipment allow factory adjustment for performance to design specifications. Competently designed active filter circuits need not be adjusted after leaving the factory; however, for specialized use the owner can easily change filter parameters.

Mindful of the fact that many of our customers are new to RTTY, Al made the CP-1 tuning as forgiving as possible, while providing the most critical operator a piece of equipment in which he could be proud. Even old "pro's" are surprised at the poor signal conditions under which the CP-1 will still provide good copy.

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MSO'S

by *Dick Uhrmacher,* K0VKH

INSTALLMENT # 8

Hi Gang! Another month has slipped by, and Summer activities are in full bloom. Along with the fishing, camping, hiking, sunburn and mosquitos, we've been experiencing some poor band conditions generally for the past couple of months, and I think it's time to once again stress the importance of listening carefully on the frequency before activating or utilizing one of the MSO's.

Since we share our spectrum with a variety of RTTY interests, it is vitally important that we consciously attempt to prevent interference to on-going QSO's, on or near the MSO frequency. With poor band conditions it is entirely possible that you may not hear one side of a QSO, or a station close to your QTH utilizing one of the MSO's. It takes just a little of your time to LISTEN on the frequency BEFORE transmitting, and it will save a lot of hard feelings! LISTEN BEFORE YOU LEAP!

MSO's are becoming more popular with each passing day, and some of the newcomers seem to have difficulties in getting the MSO's to comply with their remote commands. If I could suggest one area to concentrate on, it is the proper placement of the 'carriage return/line feed' (CR/LF) sequence while formatting remote commands. Since all commands to the MSO's m-u-s-t- be left justified, (received by the MSO on the left-most margin), it is essential that you place at least one CR/LF immediately before each remote command. Commands not received on the left-most margin are IGNORED by the MSO. I recommend that you use two CR/LF's prior to each command, as this will almost assuredly mean that your remote command will be received properly by the MSO. Secondly, even though the MSO may receive your command properly formatted on the left-most margin, it will NOT act upon that command until the system receives a CR/LF immediately AFTER the command. Commands with 'filenames' imbedded require that the CR/LF be sent AFTER the filename.

Finally, computer based equipment is FAST!! Unfortunately, due to propagation delays, equipment timing requirements, etc., your computer based equipment may be able to key your transmitter and send out remote commands in such a manner that the receiving MSO doesn't have time to properly demodulate them, and act upon them. The receiving demodulator needs a second or two of "mark hold", (or other insignificant RTTY data), BEFORE you start spewing out remote commands. One way to kill two birds with one stone (sorry about that one Mike), is to send your station identification, (something simple like CR/LF DE: KØVKH), then two CR/LF's, and finally the remote command.

Another overlooked feature of most MSO's is the capability to 'scan' the MSO "Directory" for specific information contained in the filenames. This feature is especially helpful in reducing transmitter on-the-air time, frequency congestion, and overall spectrum usage. This Directory scan feature will allow the remote user to find a specific letter/number sequence contained in the filenames, without causing the entire Directory to be sent by the MSO. For example, the remote command: .SDIR VKH, will cause the system to output a directory list of all filenames which contain the letter sequence "VKH". This dramatically shortens the time the MSO is on the air, and of course, provides for an instant list of files of interest to the remote user. Try it, ...you'll like it!

QUESTION OF THE MONTH..I'm in receipt of a note from Lee, W5DOZ, which presents the following question. "I think we need some standardization of the number of bits and parity used in ASCII transmissions on the bands. I see that some stations are using seven (7) bits and even parity, and it took some time on my part to determine this fact in order to get good copy. As you know, W1AW uses eight (8) bits and no parity. I have copied a couple of stations trying to use ASCII, each with a different bit number and that ASCII will be used more and more now, and that standardization will become increasingly important". How about some comments on this one Gang?

MSO OF THE MONTH..This month we feature an MSO presently dedicated to RTTY traffic handling, and our thanks to Larry, KAØJRQ, for bringing this fine service to our attention. Early last Winter the "Rivercities RTTY NET" was formed in Council Bluffs, Iowa, utilizing a HAL DS3100 MSO, ST6000 Demodulator, and a Kenwood TR-7800 Two-meter transciever. Although most all of the traffic was handled via 'simplex' operations, I am told now that one of the local repeaters is providing time for this Net, and it has extended the range and reliability of signals to a great extent. (I presently do not have the repeater frequency, but will try to include it in a forthcoming column). This net presently meets nightly, with approximately 35 members, and an increasing number of check-ins with traffic. The system now covers thirteen cities in the immediate area, including Omaha and Council Bluffs. After formal traffic has been completed, the net does have a 'roundtable' discussion with all members participating. Larry also

MSO COLUMN CONTINUED

tells me that they are experimenting with some traffic on 40 meters, (7076.5 KHz), in association with the 10th Regional Midwest RTTY Net, and this may include a traffic outlet through the WB8ICL MSO on 20 meters, (14 087 750 Hz). So gang, if you're into traffic handling, or would like to learn how to participate in this area of Ham Radio, drop Larry a line in one of the MSO's and I'm sure he'd like to have you aboard!

For those of you who happen to have missed the "DX Column" in the RTTY JOURNAL, (Can that be possible?), let me encourage you to take advantage of the AJØX MSO on the National Autostart Frequency (14 087 750 Hz). Joe's MSO contains up to the minute DX information, which can be invaluable in finding that rare one. And, if you have worked some exciting DX recently, drop Joe a note in his MSO about the time, frequency, QSL info etc.

PARTING SHOTS.. We're all very happy to hear that Frank, K4KOZ, is recovering rapidly from a very recent car accident, which hospitalized him for about a week. We missed him and his MSO from Boca Raton.."Red", K9KUW continues to make progress with his medical problems, including the "Battle of the Bulge". Hang in there Red, and you'll be lean and mean before you know it! Don't drink the water, is an old one, but this author can tell you that even washing your hands in it can be traumatic. After separating my 'ferocious' poodle from attempting to assault a German Shepherd, I ended up with a set of teeth marks on my right hand. Unfortunately, (and very unwisely), I washed my hands off in a convenient mountain stream, and ended up with a good case of blood poisoning!! I was never good at anything left handed, especially RTTY keyboards, and it looked for awhile, like it might be a permanent thing! A hospital stay of four days, plus mega-doses of antibiotics did the trick, and I'm happy to report that I'll be around next month to hassle you folks again!

I don't know about you, but I thoroughly enjoyed the Packet Radio articles in the RTTY JOURNAL. This exciting new field is just starting to really take off, and I forecast that this form of digital communications is the wave of the future. We may not see a lot of it in the HF portions of the spectrum, but VHF and UHF activity will abound before long. Especially attractive will be MSO's, CBMS's, etc., that will be easily accessible through satellite/ground link stations utilizing very little spectrum, yet providing world wide service. If you're into Packet Radio now, how about some follow-up articles describing your efforts, to include some specific hardware and interface examples?

See you next month Gang, and a heartfelt THANKS to all of the MSO Sysop's for their fine service. Enjoy RTTY!

DE: Dick, KØVKH

RTY FOR HEATH/ZENITH CONTINUED

call signZC - Set RELAY to copy incoming, end with 4N's
call signZR - Relay message, with VIA etc.
call signZP - Replay previous transmission
call signZD - Put incoming to disk, if in DISK COPY
call signZW - Play WRU
(colon)TIME - Play WRU
(colon)DISK - Play WRU if in DISK COPY

One of the most interesting features of RTY is the ability to send and receive 3rd and 4th level Baudot. This feature above all others seems to amaze people who are not familiar with the IMH series or RTY. It can be quite an experience to watch what seems to be normal Baudot printing out on a Baudot printer (such as a Model 28 Teletype machine) and at the same time the computer console will show upper and lower case characters coming through in perfect copy and then going to disk! Occasionally, this feature is quite handy when it is necessary to transfer a more formal text structure over the air.

RTY is clearly a sophisticated and comprehensive software package for communications over HF radio. Its' operation can be observed by listening in on 14.082500 where the majority of channel users are now enjoying the program. Please feel free to break in and ask about RTY if you are interested.

Perry Taylor deserves a hearty 'well done' for his efforts in bringing the RTY series to Amateurs interested in serious RTTY performance on HF. The program is finished with modification although some minor changes are in store to enhance the WRU selectivity.

Although the source code for any of the RTY versions is NOT AVAILABLE, Tom, (or myself) will be happy to send a copy to anyone who would like to try RTY. Please, remember to send a SASE adequate for mailing disk media and a 5.25 inch disk either hard or soft sectored using the Heath format. RTY is available under HDOS, CP/M, (for the H-89, H-8 series of computers) or ZDOS (MS-DOS, for the Z-100 series). This program is hardware specific, so don't try to run it on a non Heath machine.

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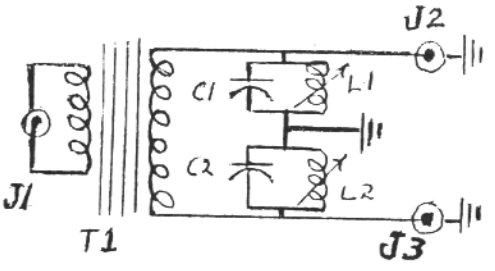
PASSIVE RTTY SCOPE ADAPTER



PASSIVE RTTY SCOPE ADAPTER

BY:AA1 Lescard, K1TJV
39 Maplewood Avenue
Tyngsboro, MA 01879

Now that the computer age is here, many of us have taken the plunge and are amazed at how well it handles our RTTY, CW, etc. After connecting up our computers and interfaces, we kind of miss that cross-pattern on the scope and find ourselves hunting around for a place to connect our scope. Until lately, none of the new gear had a scope output to sooth some of us who like to copy some of the commercial stations with their various shifts and speeds . Who knows what shift they are using if we do not have a scope to display it? Is it possible to copy that station who is using 850 cycle shift with my TU or interface which has filters for only 170 cycle shift? The answer is YES, with a properly tuned scope adapter which connects between the receiver earphone jack (or speaker) and your scope. This adapter uses no power, and when adjusted to the familiar cross pattern on 850 cycle commercial stations it will display any other shift that it copies down to 170 cycle or lower. It can be assembled in an evening and most parts may be available in your junk box except for the chassis box and the tunable channel filter coils. These coils are available from: Bell Industries, J.W.Miller Division, 19070 Reyes Avenue, POB 5825, Rancho Dominguez, CA 90224. The tab is $6.60 per coil plus a UPS charge.

Transformer T1 is used to step up the low audio voltage to 5 or 10 volts, which is then applied to the channel filters. The filters separate the Mark and Space tones which are then applied to the horizontal and vertical terminals of the scope. T1 can be either an old 6.3 volt filament xformer or a spare audio xformer from a broken speaker. It is used in reverse, that is, with the receiver audio connected to the 4 or 8 ohm speaker leads. The primary wires are then connected to the filter coils. Since all components are mounted inside the box it presents a somewhat streamlined appearance and the only parts seen are the two phono jacks on the one end and the audio input jack on the other end, plus the tuning slug adjustment screws on top of the box.

Begin construction by mounting the two phono jacks on one end about 1¼ inch apart. Mount the audio input jack in the center of the opposite end. Mount the xformer inside and close to the input jack. Mount a 6 lug terminal strip across the middle of the box on the inside to simplify mounting of xformer leads, caps, ground, etc. The channel filters are mounted in 5/16 holes drilled in top of box near the two output jacks. These are pushed thru from the inside.

After assembly, connect output from J2-J3 to scope terminals. Connect J1 to earphone or speaker output on receiver. Turn on scope and feed a 2125 cycle Mark tone to the unit. Now adjust the slug in the coil having the .1 capacitor for maximum indication on scope. Do the same with the other coil with a 2975 cycle tone. One tone will show a horizontal ellipse and the other a vertical. Each adjustment can be further refined by tuning in one of many commercial stations which use the wide shift if an accurate tone generator is not available. After the tuning process, it is now ready to indicate all shifts, 850 to 170. If used only on the Ham bands, slugs can be adjusted for the familiar cross display on 170 cycle, but will be less than ideal when displaying other shifts.

PARTS LIST

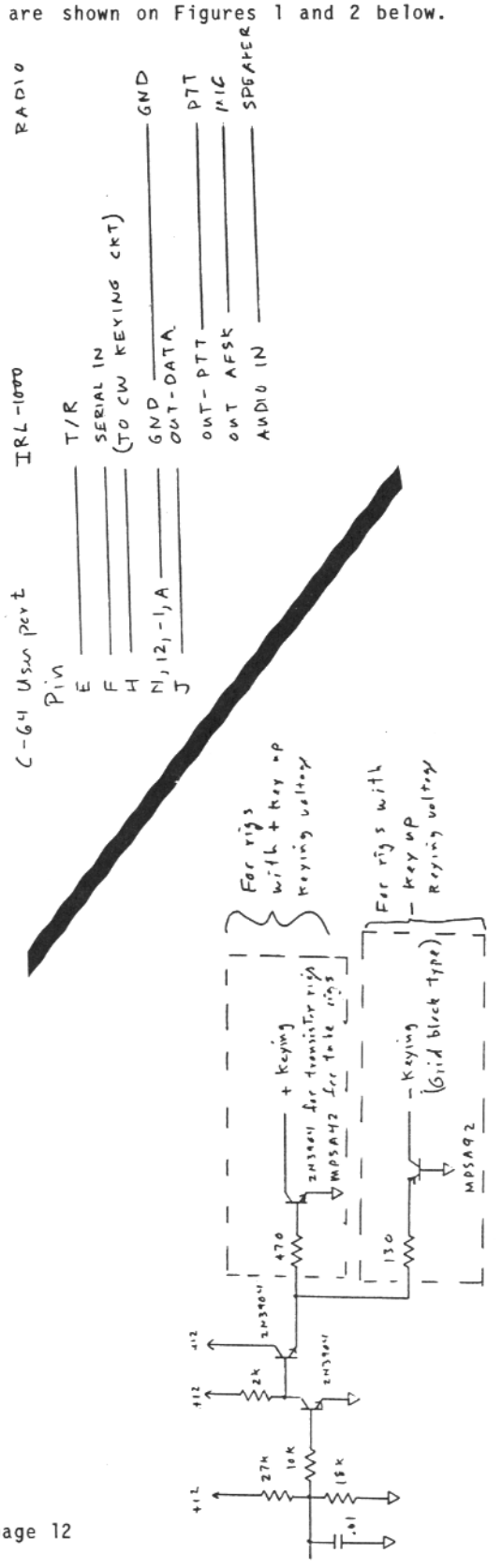
T1 - 6.3 V. Filament Transformer or Audio xformer
J1 - 1/8" 2 conductor phone jack (Radio Shack 274-251)
J2-J3 - Phono jack (Radio Shack 274-346)
L1-L2 -Adjustable inductor (J.W.Miller #9007)
C1 -.1 MF (approx.)
C2 -.07 MF (approx.)
Chassis Box -5"x3"x2" (Radio Shack 270-238)
Terminal Strip -6 lug (Radio Shack 274-688)

IRL ON AMTOR

By Alan Chandler,K6RFK

Continued from last month....

The cable connections for the Commodore 64 and the CW keying circuit are shown on Figures 1 and 2 below.



HITS & MISSES

GEORGE HAMMON, WA6CQW
14215 Pecan Park Lane Space 73
El Cajon, CA 92021

by GEORGE

Hope that all of you got through the summer in one piece! The XYL and I just returned from a three week sojurn into the heart of America and met a bunch of super Hams along the way. We stopped at the County Hunters Convention in St. Louis, Missouri and met old friends and made new ones. THe trip with our car and new trailer proved mostly uneventful except for the rain, of which we had plently, at first but the rain clouds cleared and we had mostly sunny and warm wx during the entire trip back home.

I almost wish that we had not gone on our trip, for the Amateurs back home in Southern California were having some proud moments for themselves. The San Diego County Fair hosted an Amateur Radio Booth featuring not one, but two, Teletype machines manned by MARS personnel on the one and the San Diego Council of Radio Amateur Clubs, (SANDARC) on the other.

Other Hams were helping with radio communications during the time that the Olympic Torch was in San Diego and Orange Counties. One RTTYer conspicuous during that time was Bob, WOHAH, retired AT&Ter and part time professional clown. He came all the way from Minneapolis to be a part of the Torch parade. The tales he can tell.....

Other Amateurs were called on to help with communications during the Olympic Games. Some send messages from the athletes to their far away homes and others helped with events such as the Equestrian event at Fairbanks Ranch in San Diego County. 100 Amateurs took part in keeping scores up to date, assisting judges, getting medical help to those hurt people and horses, and handling all of those problems never before encountered by Amateurs. RTTYers:Dave, WA6HQM; Rich, WA6CFM; Bob, W6JWU; Jim, WA6UFY;Linda WA6HGA; and those on our cover, were just some of them.

Next month I will end the series on the "LOGGER", had to get some additional information not now in hand.

Meanwhile please write to the FCC/& your Senator or Congressman addressing RM #4829 and #4831. It concerns the possible loss of our 220 band. There is a lot of local RTTY activity on this band and it would be a shame if we did lose it.

So long for now, George, WA6CQW...

CLASSIFIED ADS

CONTINUED ON PAGE 15

THE STANDARD OF EXCELLENCE

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Code: Morse (CW includes Kana), Baudot (RTTY), ASCII (RTTY), JIS (RTTY), ARQ/FEC (AMTOR).
Characters: Alphabet, Figures, Symbols, Special Characters, Kana.
Built-in Monitor: 5" high resolution, delayed persistence green monitor – provides sharp clear image with no jiggle or jitter even under fluorescent lighting. Also has a provision for composite video signal output.
Time Clock: Displays Month, Date, Hour and Minute on the screen.
Time/Transmission/Receiving Feature: The built-in timer enables completely automatic TX/RX without operator's attendance.
Selcal (Selective Calling) System: With this feature, the unit only receives messages following a preset code. Built-in Demodulator for High Performance: Newly designed high speed RTTY demodulator has receiving capability of as fast as 300 Baud. Three-step shifts select either 170Hz, 425Hz or 850Hz shift with manual fine tune control of space channel for odd shifts. HIGH (Mark Frequency 2125Hz)/LOW (Mark Frequency 1275Hz) tone pair select. Mark only or Space only copy capability for selective fading. ARQ/FEC features incorporated.
Crystal Controlled AFSK Modulator: A transceiver without FSK function can transmit in RTTY mode by utilizing the high stability crystal-controlled modulator controlled by the computer.
Photocoupler CW, FSK Keyer built-in: Very high voltage, high current photocoupler keyer is provided for CW, FSK keying.
Convenient ASCII Key Arrangement: The keyboard layout is ASCII arrangement with function keys. Automatic insertion of LTR/FIG code makes operation a breeze.
Battery Back-up Memory: Data in the battery back-up memory, covering 72 characters x 7 channels and 24 characters x 8 channels, is retained even when the external power source is removed. Messages can be recalled from a keyboard instruction and some particular channels can be read out continuously. You can write messages into any channel while receiving.
Large Capacity Display Memory: Covers up to 1,280 characters. Screen Format contains 40 characters x 16 lines x 2 pages.
Screen Display Type-Ahead Buffer Memory: A 160-character buffer memory is displayed on the lower part of the screen. The characters move to the left erasing one by one as soon as they are transmitted. Messages can be written during the receiving state for transmission with battery back-up memory or SEND function.
Function Display System: Each function (mode, channel number, speed, etc.) is displayed on the screen.
Printer Interface: Centronics Para Compatible interface enables easy connection of a low-cost dot printer for hard copy.
Wide Range of Transmitting and Receiving: Morse Code transmitting speed can be set from the keyboard at any rate between 5-100 WPM (every word per minute). AUTOTRACK on receive. For communication in Baudot and ASCII Codes, rate is variable by a keyboard instruction between 12-300 Baud when using RTTY Modem and between 12-600 Baud when using TTL level. The variable speed feature makes the unit ideal for amateur, business and commercial use.
Pre-load Function: The buffer memory can store the messages written from the keyboard instead of sending them immediately. The stored messages can be sent with a keyboard command.
"RUB-OUT" Function: You can correct mistakes while writing messages in the buffer memory. Misspellings can also be erased while the information is still in the buffer memory.
Automatic CR/LF: While transmitting. CR/LF automatically sent every 64, 72 or 80 characters.
WORD MODE operation: Characters can be transmitted by word groupings, not every character, from the buffer memory with keyboard instruction.
LINE MODE operation: Characters can be transmitted by line groupings from the buffer memory.
WORD-WRAP-AROUND operation: In receive mode, WORD-WRAP-AROUND prevents the last word of the line from splitting in two and makes the screen easily read.
"ECHO" Function: With a keyboard instruction, received data can be read and sent out at the same time. This function enables a cassette tape recorder to be used as a back-up memory, and a system can be created just like telex which uses paper tape.
Cursor Control Function: Full cursor control (up/down, left/right) is available from the keyboard. Test Message Function: "RY" and "QBF" test messages can be repeated with this function.
MARK-AND-BREAK (SPACE-AND-BREAK) System: Either mark or space tone can be used to copy RTTY.
Variable CW weights: For CW transmission, weights (ratio of dot to dash) can be changed within the limits of 1:3-1:7.
Audio Monitor Circuit: A built-in audio monitor circuit with an automatic transmit/receive switch enables checking of the transmitting and receiving state. In receive mode, it is possible to check the output of the mark filter, the space filter and AGC amplifier prior to the filters.

CW Practice Function: The unit reads data from the hand key and displays the characters on the screen. CW keying output circuit works according to the key operation.
CW Random Generator: Output of CW random signal can be used as CW reading practice. **Bargraph LED Meter for Tuning:** Tuning of CW and RTTY is very easy with the bargraph LED meter. In addition, provision has been made for attachment of an oscilloscope to aid tuning.
Built-in AC/DC: Power supply is switchable as required; 100-120 VAC; 220-240 VAC/ 50/60Hz + 13:8VDC.
Color: Light grey with dark grey trim – matches most current transceivers. **Dimensions:** 363(W) x 121(H) x 351(D) mm: Terminal Unit.
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DX COLUMN CONTINUED

CONGRATULATIONS are extended to WD5ELJ, WB2VTD and UT5RP. These fine operators just made the transition to ARRL DX Century Club membership. Jack, WD5ELJ, called me not long ago and memtioned that four members of his club all sport cards from 9V1UQ, as confirmation for Singapore. The lucky ones are W5HEZ, WB5HBR and KA5-CQJ along with Jack, who by the way is ex-9V1UC. Nice going fellows! Dee reports that James, 9V1SI, is no longer active on RTTY and has moved to Houston, TX. Less and less RTTYers there in Singapore I am afraid. On to the goodies!

DX - Heard, Worked and a bit of QSL information

ZS6UY	14.090	1223Z	QSL:CBA (callbook address)
HZ1AB	14.090	0027Z	QSL:K8PYD
GJ4TVZ	14.097	2232Z	QSL:POB 338, St.Herier, Isl of Jersey, England.
6Y5SH	14.080	0210Z	QSL:AK1H
ZK1CG	14.083	0553Z	QSL:CBA
YS7OB	14.090	2330Z	QSL:CBA
CN8EL	14.085	2217Z	QSL:W2PD
F8XT	14.092	2225Z	QSL:Jean Hurtaud, Chillac,Brossac, 16480 France.
V2AW	14.095	0016Z	QSL:CBA
JA1JDD	14.083	1220Z	QSL:CBA
LX1WH	14.096	2024Z	QSL:CBA
SV1DO	14.088	2013Z	QSL:POB 33, Glyfada, Athens Greece.
ZS3B	14.077	1420Z	QSL:Gerd, POB 109, Luderitz, Southwest Africa.
GM4VAN	14.085	2350Z	QSL:CBA
4X6LB	14.089	0036Z	QSL:CBA
KE5IZ/PJ3	14.086	0200Z	QSL:WA5ZVZ
UB5MDI	14.093	0340Z	QSL:Vlad, POB 3EEEET, Kommunarsk, 349100 UK,USSR
UT5RP	14.088	0430Z	QSL:Dima, POB 300, Odessa, Ukraine, USSR.
VU2VIM	14.082	1947Z	QSL:B-170, East of Kalish, New Delhi, India
PJ8UQ	14.095	2140Z	QSL:W3HNK
T30AT	14.087	0410Z	QSL:G4GED
ZP5CW	14.092	0515Z	QSL:POB 1777, Ascuncion, Paraguay.
HP2SM	14.088	1425Z	QSL:POB 155, Colon, Panama.
YJ8GX	14.096	0522Z	QSL:F6GXB
CX4AAU	14.096	0210Z	QSL:POB 374, Montevideo, Uruguay, S.A.
YO3AC	14.090	2220Z	QSL:CBA
FO8KS	14.091	0315Z	QSL:POB 5252, Pirae, Tahiti, French Polynesia.
DU7RLC	14.099	1710Z	QSL:Meloy, POB 901, Bacolod Cty, Philippine Isl.
FK8AH	14.091	0510Z	QSL:CBA
A71AD	14.093	2217Z	QSL:CBA
OX3BJ	14.090	1240Z	QSL:CBA
SV1JO	14.088	1107Z	QSL:CBA
ISØPMZ	14.098	2050Z	QSL:Bureau.
UAØLFK	14.090	1347Z	QSL:Bureau.
UO5OK	14.087	1745Z	QSL:UT5RP
OD5NG	14.078	1911Z	QSL:CBA
OH3SR	14.095	2030Z	QSL:Bureau

It appears that Carl, K6WZ, was successful in his attempt to extract a QSL card from 6Y5MC. It seems that the manager for 6Y5 also handles cards for numerous other stations and is, to put it mildly, swamped at the moment. VK9NS has moved over to P29 for awhile and took a Tono with him. Look for RTTY activity from Jim.

A bit late but worth mentioning is the operation that took place from the Vatcan by Luciano, I5FLN, who activated HV2JO on the 22nd of June and ran for the better part of three days. I did not work him, but numerous others did. Congratulations. The Knights of Malta operation, also scheduled for June has been delayed until September. Most of us need that one on RTTY so keep your eyes and ears open! HZ1AB has been reported active and strong on the West Coast. Should be an easy one considering their station equipment and propagation to that part of the world is generally good.

A special thank you goes out to all of you that sent in information for this months column, W2JGR, NU6X, N4FLJ, W5DOZ, W1DA, WB2CJL, WOWWP, KZ2T, K5FL, K4AGC, KB4FHE, VE3FJB, N1BNK, W6MI, IOAOF, and TG9VT. Take care and the best of DX until the next time.

73, Joe, AJØX....SK

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