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VOLUME 32 NO. 8 OCTOBER 1984 ONE DOLLAR

KATSUO TAKARA, JR6AG, OF OKINAWA

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RTTY JOURNAL

DEE CRUMPTON, N6ELP,
formerly KA6NYW
Owner-Editor
Post Office Box RY
Cardiff-By-The-Sea, CA 92007

JOHN P. GOHEEN, KA6NYK
Associate Editor

BUSINESS OFFICE
1155 Arden Drive
Encinitas, CA 92024
Tele: 619-753-5647

Postmaster send form 3579 to:
P.O. Box 179, Cardiff, CA 92007

SUBSCRIPTION RATES

USA	$ 7.00 per year
CANADA, MEXICO	7.50 per year
CANADA AIR MAIL	8.50 per year
MEXICO AIR MAIL	8.50 per year
FOREIGN	7.50 per year
FOREIGN AIR MAIL	13.50 per year

BACK ISSUES

A duplicate of any back issue may be obtained from Red Wilson, 4011 Clearview Drive, Cedar Falls, IA 50613. $1.00 PPD & SASE. Reprints of all (2) UART articles $2.00 PPD.

MANAGERS

JEAN HURTAUD, F8XT
Chillac
16480 Brossac, France

DR. ARTHUR GEE, G2UK
21 Romany Road, Oulton Broad
Lowestoft, Suffolk
NR32 3PJ, England

KANJI YAMAMURA, JH2FHX
2-42 Umenoki, Izumi-Machi
Toki-City, Gifu-Pref
Japan Mail No. 509-51

The Publisher assumes no responsibility for errors, omissions and assumes no liability for such. Reproductions of this magazine must be accompanied by credit to the *Journal* and the Author. The *RTTY Journal* is published 10 times per year with May/June and July/August combined. Publication will be on or about the 20th of the month. Subscriptions and ads must be paid for by cash, check or money order in United States funds only.

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FREE BROCHURES AND INFORMATION

by GEORGE

HITS & MISSES

GEORGE HAMMON, WA6CQW
14215 Pecan Park Lane Space 73
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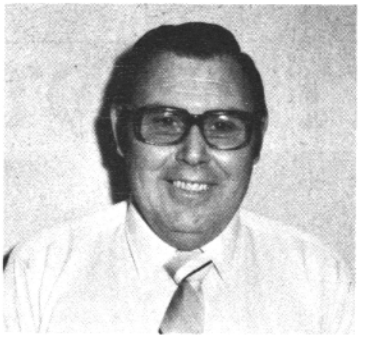


In my column this month, I will continue my series on, "THE LOGGER".

FORMATTED REPORTS

There are two formatted reports available to the user: A. Quick Print B. Sorted Reports. They are identical in appearance except that the sorted version is sorted by station in ascending sequence. There are no sorting options. Both reports have access to the sift process so that the printed log entries can be as few or as many as the user desires. When the report is interruptable and repeatable, therefore. multiple copies are available without further processing.

QSL REPORTS

"THE LOGGER" is capable of printing QSL report forms and QSL cards. The report forms are intended to be printed on peel-off type labels for direct application to the users own QSL cards.

The QSL report form program is formatted properly for 4" X 1.43" labels. The QSL card card printing capability is designed to print personalized QSL cards ready for addressing and stamping or bulk mailing to a QSL bureau. The format is suited to a four by six continuous card stock. This size will accommodate call users call signs up to six characters in length. The user may enter up to six message lines which will be printed at the bottom of each QSL card printed; the program will prompt for all six lines. When fewer than six lines are desired, a null response will cause a blank line to be printed. A typical line might be, "thanks for QSO", or, "please QSL via the bureau".

COMMENTS

A general comment is pertinent at this time about the sort algorithm used by "THE LOGGER". It is a sort known as "HEAPSORT", and is classed as a 'NLOG(N)' sort. This means that its' performance does not rapidly degrade with an increase in the number of records to be sorted.

The logic in the program is very isolated and may be replaced by the user with any other sort method with little or no programming effort. The original version of the program used a faster recursive method for sorting (quicksort) but the recursive limit of the Apple II+ computer was not sufficiently large enough to sort a maximum size data base/ The usesr may observe the Heapsort's progress as two indicators are shown on the screen during any sorting process. These indicators are labelled "L" and "LR" and will both appear to countdown to "1" as the sort progresses. When both reach "1" the sort is complete and the processing will continue.

The Apple II+ from time to time, and frequently during long sorts will appear to stop. When this occurs it is merely going thru its garbage collection process and depending on what the user is doing may take a few seconds or a few minutes to complete. Rest assured that when it is complete, processing will continue. The Apple II+ Applesoft manual refers to this phenomenon on page 53 under the explanation of the 'FRE(EXPR)' command. During processing, "The Logger" will post advisory messages on the screen. The user should do as the advisory suggests (wait) and/or make note of the information posted for future use. These messages have been included for the users convenience so that they would not be faced with a blank or non-descript screen while lengthy processing was going on.

The user should note the sorted report and both of the QSL card functions are implemented as seperate programs. This was necessary for memory space reasons.

"THE LOGGER" makes use of many strings. This makes for a very flexible and user friendly software, but it is not the speediest way of getting things done. There is no good solution to this,as yet, but a couple of things will help.

1. If you have an Applesoft compiler, you can achieve dramatic speed improvement results. You may find a slight programming adjustment necessary for sucessful compilation. Those will depend on the make/manufacture of your compiler. "THE LOGGER" uses standard garden variety Applesoft commands and very few Peeks and Pokes. The ones it does use are well known and will not pose any undue difficulties.

2. The DOS mover program will enable you to move himen up in memory considerable, thus giving more space for string storage and thereby delaying and minimizing the garbage collections. The use of fast DOS is of little help unless it can improve the handling of text files.

This concludes my column series on "THE LOGGER". I hope this will arouse your interest in this fine program. The 4 X 1.43" labels can be ordered from NEBS FORMS, 12 South St., Townsend, MA 01469 as #9811 and the cards 4 X 6" are #9949.

So long for now, George, WA6CQW....

SOME THINGS TO WONDER ABOUT-From THE Dam Paper, TRI-COUNTY AMATEURS.....
How can you tell when it's exactly midnight? When the darkness is directly overhead..
Why do days get longer in the summer? Heat makes things expand....
What holds things together? Velcro, neutrons and protons are held together by Velcro.

MSO'S

INSTALLMENT #9

by *Dick Uhrmacher*, KØVKH

Hi gang! Summer continues to provide us with some marginal band conditions, which further causes some difficulties with the various MSO's. QSB gobbles up the remote commands, QRN blasts them into unintelligible garbage, and weak signals from both remote stations ans MSO's maean you are going to get STEPPED ON!

So, You ask, how can I still manage to take advantage of these wonderful machines? More than anything, good operating practices will reap bountiful returns! Know the system you are using well enough that your commands strike home the first time. Let 'old Betsy' warm up a bit prior to sliding on the MSO frequency, so that you are confident that your tones/FSK match those of the MSO, and that once on frequency, your transmitter won't head for the nearest band edge! If there's one single item that causes more missed MSO commands, it's the remote station being off frequency just enough for the MSO demodulator to receive poor copy. A short amount of "Mark hold" just prior to sending the remote command will also assist in getting the MSO demodulator "in the mood"! Experience has shown that when the MSO demodulator is required to copy valid RTTY data just prior to a remote command, it hardly ever fails to execute the command. So, many MSO users send:"DE WOXXX" (your callsign of course), just prior to the command, and not only get good MSO results, but fulfill the FCC identification requirements as well.

Placement of the CR/LF (carriage return/line feed) is another item that needs to be understood when utilizing the MSO's. This delineator causes your remote command to be executed by the MSO. Consequently, placement of the CR/LF is of great importance. There are two rules to remember: 1) Commands WITHOUT a "filename" require a CR/LF immediately after the command for execution of that command. For example, .SDIR (CR/LF) - .EXIT(CR/LF), etc. 2) Commands WITH a "filename" require a CR/LF immediately after the filename for execution of that command. For example, .READ DX BULLETIN 19(CR/LF)-.WRITE WB8ICL DE W(CD(CR/LF), etc. A bit of concentration on this item, and you'll find that the MSO's will respond to your every command!

And, I hate to miss one opportunity to plead for nothing less than common courtesy on the RTTY MSO frequencies. LISTEN before you transmit or activate one of the MSO's. You may not hear a remote station utilizing an MSO, but you may hear the MSO replying to his commands. Digital communications are becoming more and more popular each day, and it behooves all of us to be considerate of our fellow Amateur operator!

We're happy to announce the return of an old standby in the MSO service, and to welcome a newcomer to the ranks of MSO SYSOP's. Bob, WB7QWG/9, Indianapolis, Indiana, has returned to the air with his "Information Bank". This fine TRS-80 based system can be found on the carrier frequency of 14 097 500 Hz. (Mark frequency is: 14 095 375 Hz.), and the access code Is:QWGZW. If you want to keep up with all of the latest in Ham radio information, check Bob's MSO from time to time. Welcome back Bob! And, we're happy to have John, WB9JPH/5, join the MSO group on the National Autostart Frequency, (carrier frequency is 14 087 750, and Mark frequency is 114 085 625). John is with the United States Air Force at Tinker Air Force Base, near Oklahoma City, OK, and he runs the TRS-80 Model 4, with the Crown ROM-116 interface. The software being used is from WB4EJE, as modified by others. His access code is: MSOJPH. Welcome aboard John!

MSO OF THE MONTH: The WBØGUX MSO is located in Englewood, Florida, and is sponsored by the Southwest Florida Amateur Teleprinter Association. The repeater consists of a MICOR Repeater and an INFO-TECH M700A RTTY Repeater Controller/MSO, operating at 74 baud (100 WPM), 170 Hz shift. This VHF MSO operates at 146.10 input. The access code is "RPTRTTY", and the command "RPTHELP" will provide a complete list of operating commands. The South west Florida Amateur Teleprinter Association meets once a month, has approximately 30 members, and welcomes visitors as well as users to their meetings. Thanks to Dave Kelce of the SW Teleprinter Association for providing information on this system.

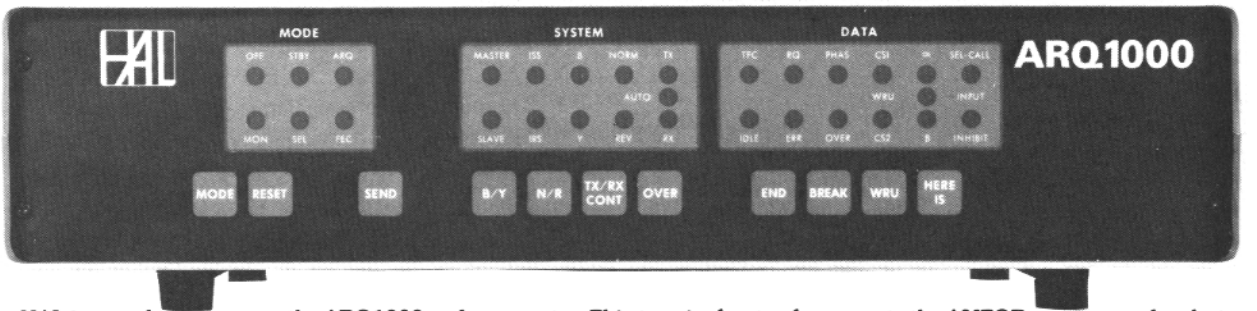
It's always nice to have the ARRL bulletins to refer to, if for nothing else, just to keep current on affairs affecting Amateur Radio. Several different MSO's carry these bulletins, making access to them at times when W1AW may be unreadable, quite easy. Look for the ARRL bulletins in the following MSO's: AJØX (MSOAJOX), Laurel, MS; WB8ICL, (MSOICL), Yellow Springs, OH; W6ZRR (MSOZRR), San Luis Obispo, CA; and W5QXK, (MSOQXK), Richardson, TX.

I have been maintaining a technical data library in my MSO (MSOVKH) on the National Autostart Frequency, for some time now. It contains a series of files which may be of interest to the RTTY enthusiast, mainly items concerning current RTTY equipment, interface requirements, and modifications to the more recent Ham transceivers for better utilization on RTTY. There's also some information on interface requirements for many of the currently popular dot matrix printers. This information is free for the asking, and if you have some technical data you would like to contribute to the Library, frop me a line at home, to the RTTY JOURNAL, or a note to my MSO.

MSO HINT OF THE MONTH: Poor band conditions, QRN, QRM, and other forms of interference can cause the remote MSO user untold frustration. But nothing is worse than silence from the MSO after you've just sent a 2000 byte file, and a properly formatted

PAGE 4-See Page 7

AMTOR RTTY

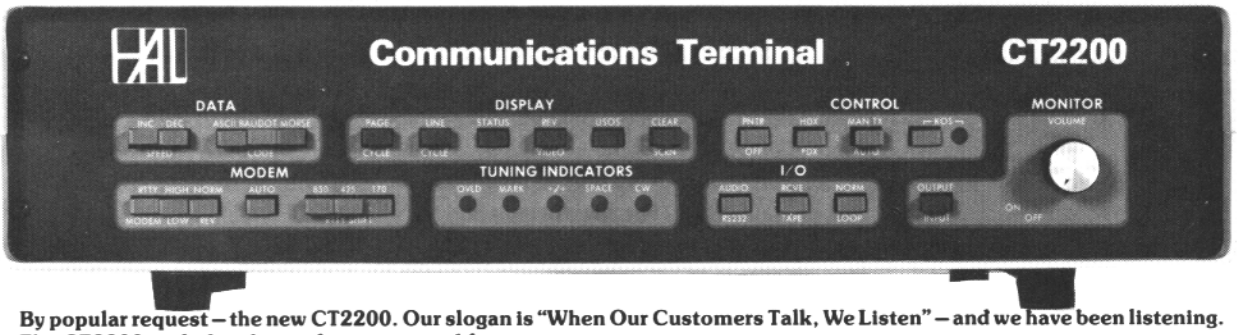


HAL is proud to announce the ARQ1000 code converter. This terminal not only supports the AMTOR amateur codes, but meets ALL of the commercial requirements of CCIR Recommendation 476-2. The ARQ1000 can be used with present and previous generation HAL RTTY products. In fact, any Baudot or ASCII full duplex 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
- "Handshaking" control for printer and keyboard or tape
- 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
- Encryption option available for commercial users
- 8½" × 17" × 10½"

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
- 3⅝" × 17" × 10½"

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.

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DX

JOE WOOD, AJØX

POB 84

LAUREL, MS 39440

Hi gang! Good to be here with you again. It seems regressive to go back and mention August, but with lead times, perhaps you will understand. I have to state that August 1984 will not be forgotten for a long time in as much as the appearance of China on RTTY shook the DX world. A lot of fellow Hams around have yet to work them on SSB or CW and not to add to their frustration and our delight they are on RTTY! The morning of August 18th, the MSO came to life and the word that BY5RA had made an appearance and was worked by I8AA and several other European stations became a series of bytes, suitably arranged on disk to whet the appetite of even the most casual DXer.

We all started listening, patiently spinning the dial, checking the antenna headings and propagation charts and for days shared the frustrations of the multitude that wanted to work this rare of all rare countries. Nothing, except for the sounds of Europeans in pile-up harmony calling the Chinese station. Then, another message came in. W1DA was letting me know that he accomplished what each of us was hoping to do, and at 1057Z, September 7, on 14.080, he may have been the first Ham in this country to do so. Other reports have reached this writer. In a very nice letter from Joe, IOAOF, he told me that on August 17th, he too had made contact with BY5RA. He went on to explain that the operation from Fuzhou City, Peoples Republic of China was being conducted by a group of Japanese operators to celebrate the 35th Anniversary of the Liberation of Fuzhou. According to Joe, the pile-up grew to tremendous proportions and the operation came to a halt after one hour of operation. The Chinese have subsequently taken over the RTTY operation; this is evidenced by the name of the operator at the time W1DA worked the station. George mentioned the name as Lin and the QTH info as POB 730, Fuzhou, P.R.C. I wish each of us luck as we patiently await a chance to work this one!

Last month I mentioned some of the Hamfests that are to take place this month. Well, I have been advised that the Mobile, Alabama and the New Orleans, Louisiana groups have scheduled their get-togethers on the same weekend. These locations are 100 miles apart and although one could conceivably could go to one on Saturday and one on Sunday, I seriously doubt that will occur and I still have to make a choice. The DXers will likely be more in attendance at N.O. than at the Mobile affair, so it stands to reason that I should go to Louisiana. The New Orleans event sports another attraction, the Worlds Fair (and a RTTY station set up there in). The Fair really appeals to my XYL and should provide the clincher.

I would like to, again, touch on the RTTY Honor Roll bit without driving it into the ground. It was pointed out last month that we need to get moving and see if we can turn this thing around to gain an honor roll listing. I have received feedback from a number of individuals, some positive and, of course, some negative. I must emphasize that we must pursue this and if you haven't written your ARRL DX Liason person and copied your Division Director and the General Manager at ARRL then you are letting all of us down. It will not take but a few minutes of your time and if enough of us do this then perhaps, just perhaps, we can persuade the right person to take another look at this injustice. Enough said!

Are you suffering from lack of QSL returns on direct mailings to stations in the USSR? George W1DA, sends along a valuable hint by reminding us that direct QSLs from the USSR may be hastened along if you include "mint stamps" for that country. He further advises that these stamps may be obtained in the states by contacting George Robertson, W2AZX, at 7661 Roder Parkway, Ontario, New York 14519. Any inquiries to George (W2AZX) should be accompanied by a SASE. This approach may increase your returns and, as you know, we can use all of the help that we can muster in this area.

I am still in the process of transcribing the tape that Tom, N4FJL sent along. If you missed this column last month (Heaven forbid) I would like to mention that this tape is a vivid recounting of Tom's experience, over the years, with Ian, T21TA. As you will recall, Tom is Ian's QSL manager. I think that the "Saga of T21TA" will be worth the wait and it should appear here in the JOURNAL in the very near future.

CONGRATULATIONS are extended to KB2VO who just achieved what many of us are working toward, the ARRL DX Century Club Award. Nice going and continued wishes of success.

On to the goodies!

DX - HEARD - WORKED and QSL ROUTES

EL2AT	14.087	2126	Via OE3NH
FG8DE	14.085	2300	CBA (callbook)
YS1GMV	14.090	2345	Box 1557, San Salvador
GI4OWA	14.093	2020	CBA
HR5SB/2	14.096	1940	Via WBØMZB
VS6AO	14.089	1400	CBA
EA6KY	14.089	1455	Box 54, Mahon, Menorca, Spain.
ZK1CG	14.094	0435	CBA
PZ1DX	14.089	2050	Box 2163, Paramaribo, Sur.
SV1JO	14.092	2221	CBA
UZ3AYR	14.095	2120	BURO
IK2EGP	14.082	2315	CBA
HI8ADF	14.097	1445	Box 1372, Santo Domingo.
KL7LF	14.083	0200	Box 82443, Fairbanks, AK 99708

".ENDFILE" command! Don't panic and re-send the file, before you've sent that ".ENDFILE" at least TWICE again. Preface it with a few RYs', (to get the MSO demodulator cooking), and then zap that ".ENDFILE" in again. Many times it will properly close the file, saving you the exercise of sending that file again. And, remember, that if the ".WRITE (filename) command has been received by the MSO, the ".EXIT command will also cause the MSO to store that file to disk. Later versions of the HAL MSO system.

Finally, many of the MSO's now in service will respond to abbreviated MSO commands. For instance, ".W" for write, ".EX" for exit etc. With poor band conditions, the shorter the command, the more chance you have of successful execution, so it behooves all of us to utilize them!

There's MSO's and CBMS's popping up all over the place these days, particularly in VHF and UHF service. We'd like to feature YOUR system in the MSO COLUMN, but we need the specifics from YOU! How about dropping us a line with the information concerning your system, and we'll make sure that it gets published in the RTTY JOURNAL. We're also interested in items that will improve the MSO's, the services they provide, and the way they are operated. You have a complaint? MSO and CBMS SYSOP's depend on user feedback to improve the system, their operating techniques etc., so let us know what you like, or dislike about MSO's and we'll spread the word!

Until next month, good luck, and I'll be looking for you on your favorite MSO! See you on RTTY!
DE DICK, KØVKH.....

9H1GDA/A	14.089	2130	Box 114, Valetta, Malta.
TZ6FE	14.090	2235	Via DL4BC
"	21.089	2035	"
UB5MDI	14.094	2350	Box 6, Kommunarsk 349100,Ukraine, USSR
YB3BHP	14.095	1430	Box 302,Surabaya, Indonesia
FG7CX	14.081	2130	CBA
CN8EL	14.086	1715	Via W2PD
YV5ADZ/5NØ	14.091	1909	Box 1,Robertsfield, Liberia
9X5SP	14.086	1837	Via DL8OA
SVØBV	14.094	1732	Box 33, Glyfada, Greece.
8RiRFB	14.092	0024	Box 10932, Georgetown, Guyana
LX1BY	14.087	2230	BURO
ZS3TL	14.085	1853	Via W7PHO
EA9JE	14.090	0149	CBA
6W1CK	14.092	1148	CBA
4X6LM	14.088	1920	CBA
FR7CR	14.094	1300	CBA
BY5RA	14.080	1057	Box 730,Fuzhou, PRC.
TR8JLD	21.090	1745	Box 484, Libreville, Gabon.
YBØZAE	14.092	1141	Box 4817, Jakarta, Indonesia.
YS1TG	14.087	1333	Box 1476, Santo Domingo.

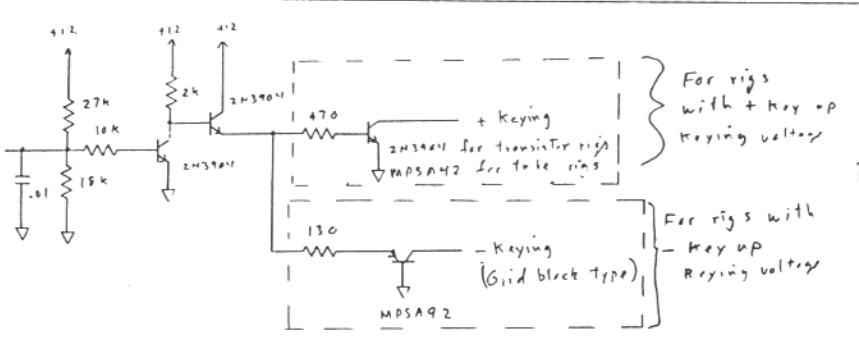
The last listed call above, YS1TG, was number 100 for W1DA. These 100 were worked since March 18th of this year. Wonder how many of us can boast of an effort like that? Very nice indeed. A real gathering of DXers is going to take place at the annual Sea Net Convention, set to take place November 16th to 18th at the Oriental Hotel in Penyang. QSL to Box 13, Penang for brochure and other interesting information. This will be the fourteenth gathering, and I'm told it gets larger each year. EL2AT should have started his Botswana activity, as A22WZ, on August 10th. He will be there for about eight weeks. QSL via OE3NH. A71AD is active and can be QSLed by way of Box 4747, Doha, Qatar. P29JS, will be active for the next five months. Jim is using a Tono that he carried along just to thrill us RTTY types. TF3IB is reported active from Iceland. T30AT, is actively representing West Kiribati and can be found around 14.085 from 0500 to 0600. QSL route is via G4GED. Joe, IØAOF, says that his totals are around 150 countries, which he reports is a great work for his poor fingers. Joe is also in a position to help you award chasers with the Holy Year Award. Contact him if you are interested. As of August 29th there is no news of the forthcoming Knights of Malta operation. Joe is keeping his finger on the pulse of that upcoming event with frequent phone calls to his friends IØAMU and IØMGM. Perhaps soon! Vollie WB4TDB, reports that he is QSL manager for KAØCYR/SV9 and WØPU/SV9. He adds, KAØCYR should be in Crete another two years.

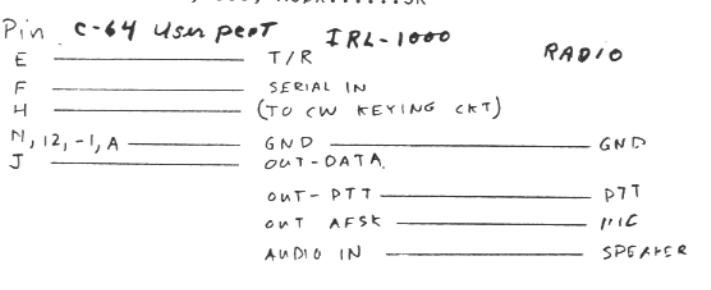
We all look forward to the improved propagation that comes with the Fall of the year. The end of this month should show some improvement and thus an increase in activity. Those active this month with reports and other information are:IØAOF, W1DA, W2JGR, TG9VT, WB2CJL, NU6X, K6WZ, K7IFG, WØWP, OK1JKM, W2PSU, N1BNK, W5DOZ and WB4TDB. A very special thank you goes out to each of these operators for their help in keeping all of us informed.

For any active RTTY DX station needing a QSL manager we have word that Roy Gould, KT1N is interested in serving in that capacity. Roy lists his address as POB DX, Stow, MA 01775. That speaks for itself Roy.

Until next time, take care and the best of DX to each of you.
73, Joe, AJØX.....SK

FROM JULY-AUGUST ISSUE - PAGE 3...IRL 1000 on AMTOR by ALAN CHANDLER,K6RFK





USING THE KAYPRO II FOR RTTY

Randall A. Mays, WA6VFC
POB 964
Vienna, VA 22180

The KayPro II computer is one of the better buys among the current crop of "transportable" machines. While not as fancy as some of the newer IBM-PC compatible computers, it can still provide excellent service with word processing, data base and financial programs. Until recently it had been difficult to use the KayPro II for radioteletype, but now specialized RTTY hardware and software is available.

Kantronics displayed their new Universal Terminal Unit (UTU) at Dayton this year and one of their demonstrations included a KayPro II. The UTU is an interface that is connected between the KayPro II's RS-232C interface connector and a radio transceiver. Hook-up instructions provided by Kantronics are more than adequate. Two DIN plugs and cables are provided. One goes to the transceiver's audio input and push-to-talk, while the other goes to the computer. The transceiver plug also has scope mark and space outputs. Receiver audio is a separate connection and there is a jack for an external speaker. The computer connector has five connections: received data, clear to send, signal ground, request to send and transmitted data.

Once the RS-232 cable is connected to the computer it is necessary to load software from a diskette that permits the KayPro II to communicate with UTU. The KayPro II comes with a simple tellecommunications program called "TERM", which resides on the CP/M diskette (CP/M 2.2 is the operating system used by the KayPro II). "TERM" programs the KayPro II to work as a "dumb" terminal, essentially the equivalent of a 300 baud ASCII KSR. "TERM" does not permit off-line message preparation or storage of incoming messages. More sophisticated programs like MODEM 7, a public domain telecommunications program, can be used for off-line work.

When the UTU receives a Carriage Return character in ASCII from the KayPro II, it sends back a menu which is displayed on the computer's CRT screen. A look at this menu gives you an idea of the capabilities of the two units. It reads, "ASCII, AMTOR B, CW, AMTOR L, AMTOR A MASTER, OPTIONS, RTTY, and AMTOR SLAVE." Pressing "O" gives another menu which says, "DIDDLE OFF, USOS ON, FULL MENU ON, ECHO ON, CRLF SUP FF, CCITT OFF, AUTO CR ON, AUTO CR ON, AUTO LF ON, XON/XOFF OFF and 0-9 XMIT DLY 50."

Some of these capabilities are self-evident, but a couple may need explanation. The ASCII command configures the unit to operate at 110 baud. Pressing the ESC (escape) key and then a number will change the speed. ESC 1 is 110 baud, for example, while ESC 4 is 300 baud. The UTU will also operate at 150 and 200 baud. In the RTTY mode it will work at 60, 67, 75 and 100 words per minute. Selecting the CCITT option changes the Baudot alphabet from U.S. to European standards and allows the UTU to have one additional speed: 132 WPM. AMTOR B (broadcast) and AMTOR L ("listen" to conversations between stations) are available along with normal Master/Slave ARQ modes.

The "XON/XOFF" feature is especially valuable when using the UTU with off-line message preparation software. The UTU has only a 32 character buffer and while this is fine for casual Morse or RTTY conversation, it soon becomes a problem if a longer message has to be sent. The KayPro II sends information to the UTU at 300 baud, so if the UTU is transmitting that same information at 60 WPM it does not take long before the buffer is filled. With the XON/XOFF feature enabled the UTU sends a signal to the computer whenever the buffer is full and the computer waits. When the buffer is empty the UTU tells the computer to send again. You can verify that this is working by watching the message on the computer screen appearing to go out a few words at a time. Without this feature the UTU would be limited to keyboard conversations; with it the UTU becomes a versatile message handling device.

There is another way of using the KayPro II on RTTY with the addition of hardware and software. The software is called "RTCP" (Radio Teletype Communications Package). Is is available from Software Design, POB 2722, Boise, ID 83701 for $39.95. RTCP programs the KayPro II to use ASCII at 110 and 300 baud, or Baudot at 60, 66 and 100 WPM. There is, however, one minor problem with 60 WPM Baudot-KayPro's designers apparently did not realize that there were still communications applications at such a slow speed and they designed the KayPro II's UART circuitry to operate no slower than 50 Baud (66WPM). The KayPro can operate at 60WPM with RTCP software, but you must mofify the Baud rate clock. No soldering is required, but it does use a few other components and the time (and risk) of opening up the computer case.

RTCP is now available in Version 2.0. It features a FIFO type ahead keyboard buffer, automatic word-wrap, a tri-level split screen (text being received, a window into the transmit buffer and text currently being transmitted), three 10 line buffers (for CQ's, Quick Brown Fox, RY's etc.), printer on/off, diddle and features for sending and receiving pictures. The latter feature can be used to copy incoming messages to the KayPro's diskette or to transmit a message prepared off-line.

Hardware for use with the KayPro II and RTCP can vary. It should work with any terminal unit that has an RS-232C capability, but I have only used it with the AEA CP-1 since it is recommended in the RTCP documentation. The AEA CP-1 can be ordered with an RS-232C option. Since several of the RS-232C pins on the KayPro II should be jumpered when using it with the CP-1, I elected to place these jumpers in the CP-1's case when the RS-232C was installed. This permits the use of almost any RS-232C cable between the two units and does not require any changes to the KayPro.

Continued next month

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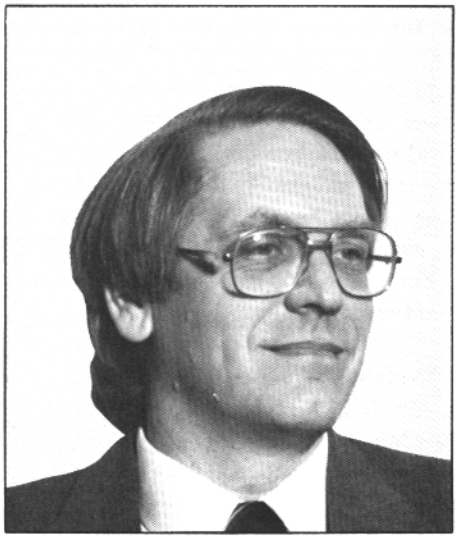

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PARALLEL LINE PRINTER INTERFACE

By:Mark Spencer
POB 5889
APO New York, NY 09012

A few years ago, I jumped into the realm of silent RTTY with the purchase of the Info-Tech M-200E and M-300C combination. They are excellent "Black" boxes that do the trick without the noise, oil, and paper of the old 'boat anchors'. This equipment wetted my computer appetite and stimulated the purchase of the Radio Shack color Computer. However, the silence of moving electrons was deafening and the volitile screens were frustrating, prompting me to search for hard copy capability for these systems.

Both systems have serial output in common, the M-200E outputs the screen presentation in ASCII format no matter what mode of code is being received, and the Color Computer (COCO) uses standard RS-232 and handshaking through the serial port. The only problem with processing serial data is that it increases the cost of competatively prices parallel printers approximately $150 for internal serial to parallel converters. Armed with data books, magazine articles, pencil, paper and the urge to exploit my newly acquired digital electronic knowledge, I set out to build my own converter to interface a parallel printer to my serial data computer.

I will present the interface in two parts. This first part will cover a serial to parallel converter based on a Universal Asynchronous Receiver/transmitter (UART). The circuit described in this part will be immediately usable with the CoCo or other serial output computers, however, an additional circuit will be required to interface a line printer to the M-200E for RTTY operation. Part two will present a 16 character buffer that will allow the M-200E to drive a parallel line printer without skipping a beat. Line printers stop receiving characters during the few seconds when the line is being printed. Unfortunately, the sending station doesn't know that the printer is busy and just keeps sending. Depending on the length of the line and the sending speed, a number of characters will be missed. For perfect copy, a buffer is required to save these characters and "dump" them into the printer when it is ready to receive new characters after printing a line.

Although the focus of my design is on the Info-Tech M-200E, CoCo, and a Gemini 10X printer, portions of the design or ideas will be useful in other applications and might even stimulate your own ideas. That is the real intention of this article.

GENERAL CIRCUIT DESCRIPTION

The result of my endeavors is the circuit of figure 1. I will walk you through the circuit with a functional look at each major component. RS-232 serial data from the computer ports (serial port of the CoCo or ASCII loop jack for the M-200E) is converted to TTL levels by IC-3, MC 1489, Quad Line Receivers. This device takes the RS-232 mark (-12v) and space (+12v) and converts them to TTL compatable levels for mark (+5v) and space (0v).

The TTL serial stream is fed to the heart of the converter, IC-1, AY 5-1013, UART. This device accepts either serial or parallel data, in various formats and baud rates, and converts the data to the complimentary data form. In this converter only the serial to parallel portion of the device is used. The UART has programmable flexibility as to the number of bits per character, number of stop bits, and parity bit configurations. Once a complete serial character is received, the parallel character is outputted and a data available strobe is sent to the receiving device. The baud rate for receiving the serial stream is set by the input clock rate allowing up to a maximum of 30 K baud.

To make the serial to parallel converter compatible with more than one system, a variable rate clock is required to accomodate different baud rate signals. In the case of the AY 5-1013 UART, the clock requirement is a frequency 16 times the desired baud rate. The MC 14411. IC-2, bit rate generator fills these requirements. The baud rate is selected by tapping output pins through the range of commonly used baud rates between 75 and 9600 baud. The clock output rates have four programmable time bases. In this case the MC 14411 is hard wired to clock at 16 times the desired baud. All this from one IC and crystal!

The remainder of the IC's and LED's are part of equipment and user specific bells and whistles that enhance the circuit operation. IC-4 and 5, 7404, Hex Inverters are used as LED drivers. The LED's serve as converter operation indicators that are useful for system testing and trouble shooting. The eight LED's give a visual indication of which bits of a character are set. Another LED is used to show when the printer has "locked up" and is not accepting new data either because of a malfunction, out of paper, or because the printer is busy processing the previously sent characters.

The IC-6, 7430, eight input NAND gate and 3 inverters are used to process printer status signals (i.e., paper loaded, on line, busy/ready, error) into the proper active state and combine them into one printer status signal that will flag a printer (handshaking). If the circuit is used with other equipment then the CoCo or Gemini 10 X, this portion of the circuit will probably have to be modified to be compatible with other printer or computer signals. The signal is not used directly with the M-200E but is used by the buffer described later as a signal that characters must be stored while the printer is busy.

CONVERTER OPERATION

The converter requires +5v and -12v DC. A substitute UART, IM 6402, CMOS UART is available that requires only +5v single power supply. It is a little more expensive and is a little harder to get than the AY 5-1013, but might be worth the effort.

The switches S-1 and S-2 control the converter format parameters.To #13

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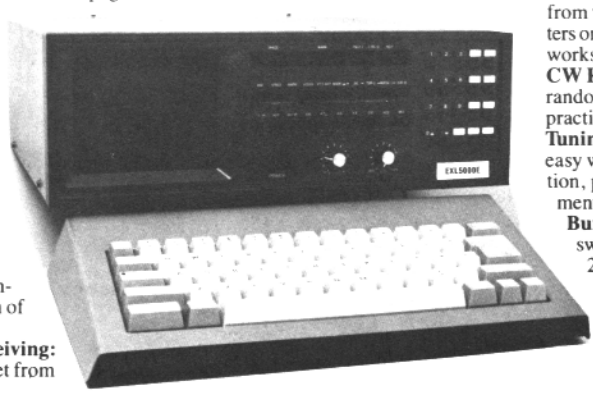
Crystal Controlled AFSK Modulator: A transceiver without FSK function can transmit in RTTY mode by utilizing the high stability crystal-controlled modulator controlled by the computer.
Photocoupler CW, FSK Keyer built-in: Very high voltage, high current photocoupler keyer is provided for CW, FSK keying.
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.
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MODIFYING THE KENWOOD TS-930S FOR RTTY OPERATION---AND MORE

John Hobson, MD, N6EGY
4604 Via Gennita
Santa Barbara, CA 93111

Like any Ham with a new toy, I was delighted with my new Kenwood TS-930S. The CW filtering, no-tune band switching and the "woodpecker" filter at first seemed too good to believe. Disappointment set in however, when I mated the 930 with a HAL DS-3100/ ST-6000 system. The filteringon AFSK was limited to SSB slope tuning which did not provide the narrow band width required for good copy on the crowded RTTY bands. Moreover, I could not feed either RS-232 or TTL outputs from the HAL system into the FSK jack on the 930 and produce true FSK RTTY signals. The 930 would not respond with anything but a steady carrier. This was especially frustrating because I soon discovered that in the FSK mode on receive, the narrow CW filtering circuits were operative, allowing excellent RTTY reception with a pass band just wide enough to admit the 170 Hz shift RTTy signal. Many of my early operating hours were therefore spent transmitting on LSB in the AFSK mode but receiving in the FSK mode. Needless to say, T/R switching was somewhat cumbersome! AS operation continued under these frustrating conditions, I met some fellow sufferers who provided the solution to this problem. Along the way, I learned of some additional modifications for the TS-930S which improved the rig's performance on AMTOR and SSB as well. Here they are:

1. Interfacing the HAL RTTY systems with the TS-930S in the FSK mode...

While in the case of the TS-930S there is no detectable difference in a transmitted AFSK and FSK signal, listening in FSK is desirable because of the narrow receive filtering. To feed FSK output from the HAL ST-6000 into the FSK port of the 930 use shielded cable with a 5 volt zener diode connected between the center conductor and shield at the input connector to the 930. (Figure 1) The diode limits the FSK signal voltage to 5 volts, the maximum acceptable voltage for the 930.

When transmitting in the FSK mode, the output of the 930 is controlled by the "processor output" control. An obvious difference between operating in the AFSK and FSK modes is that when transmitting in the FSK mode the transmit monitor function is lost. In true FSK transmissions, the microphone input circuits are not used and there is no audio to monitor unless another receiver is available in the shack. Furthermore, without the input of audio tones into the terminal unit, there are no crossed ellipses on the RTTY scope to monitor visually while transmitting. Instead, it is necessary to glance occasionally at the RF power output meter or an RF monitor scope to confirm that the transmitter is functioning.

2. Modifying the TS-930S for AMTOR

A number of Hams have described a modification of the TS-930S that improves the T/R switching characteristics on AMTOR. If the HAL ARQ-1000 is used, there is only one modification required. Locate resistor R476 on the Signal Unit Board on the under side of the 930. R476 is a vertically mounted ½ watt 470 ohm resistor that is not well labelled. (Referring to the TS-930S Service Manual is extremely helpful here.) Scrape the insulation off of the exposed lead and ground the lead by soldering a jumper wire between it and a nearby ground point. If units other than the HAL ARQ-1000 are used with the 930 it may be necessary to remove a 4.7 uF capacitor, C500, from the PTT circuit in addition to grounding the lead of R476.

3. Expanding the digital frequency display

This modification expands the display to 10Hz increments, allowing more accurate tuning in net and MSO operations. The modification is easily accomplished by grounding connector 8, Pin 8 on the Digital Unit Board, located on the top of the 930 beneath the speaker mounting assembly.

4. Reducing the VFO tuning rate.

Cut one end of diode, D13 on the Digital Unit Board. The cathode lead is most convenient as it is raised off the board. D13 is located next to pin 1 of IC-20. This modification reduces the VFO tuning rate by one-half, a perfect complement to the expanded frequency display.

5. Expanding the memory capacity to 16 channels.

Connect an insulated wire between connector 7, pin 5 on the Digital Unit Board and the top pin of the **Function** switch. This top pin soldered to the switch circuit board is normally blank. Now when the 930 is switched to VFO "B" and in the "**MEMO**" mode, 8 additional memory channels are available. These channels are programmed and recalled in the same way as the UFO "A" memory channels.

6. Scanning the memories.

Ground connector 8, pin 6 on the Digital Unit. This can be done most conveniently by soldering an insulated wire from pin 6 to an open pin on the **"DIM/NOR"** switch on the front panel. Use the fifth pin down from the top of the switch. Now, When the switch is in the **"DIM"** position and the **FUNCTION** switch is in the "A" position the 8 "A" memories are scanned at a 2 second rate. Scanning must be started with **FUNCTION** switch in the "A" position. The "B" memories may be scanned by switching to VFO "B" during scanning of the "A" memories.

These modifications improve the operation of the TS-930S immensely, both on RTTY and SSB. There are more modifications being discussed every week on the Kenwood Users Net which meets on Sundays at 2000 UTC on 14.317 MHz and in the Kenwood Users Group Newsletter*.

My thanks to Bill Henry, K9GWT and Dave Halliday, KD5RO for relaying these modifications to me. The "mods" make the HAL/TS-930S system quite a RTTY combo!

* Users International Radio Club
364 Kilpatrick Avenue
Port St. Lucie, FL 33453

Figures 1 and 2 are on following page

Table 1 gives the proper switch settings for various character formats. For instance, to set the converter up for TTY operation with the M-200E, the following switch positions would be set:

a. S-1-1 on (sets 110 baud).
b. S-1-2 thru 7 off.
c. S-2-1 on (sets number of bits to 7). S-2-2 off.
d. S-2-3 off (sets the number of stop bits to two).
e. S-2-4 off (selects no parity bit).
f. S-2-5 Off (irrelevant with no parity bit selected).

As characters are sent to the Gemini 10 X, they are stored until a carriage return is received and then printed a line at a time. So don't get concerned if data is flowing through the converter (as indicated by changing LED's) and no characters are printed.

CONSTRUCTION

I constructed the converter on a universal pre-etched PC board using wire wrap techniques. Each IC should be by-passed to ground at the Vc pin by a .01 uf capacitor even if the circuit diagram does not show one. This is one lesson I learned the hard way with digital electronics, that you cannot by-pass too much. The serial data lead in and the parallel output leads are shielded cables. Power leads can tap +5 and -12 volts off the host system, however, I use a separate power supply. Eight element DIP switches were used for S-1 and S-2 to facilitate ease of programming and possible expansion later. I obtained all parts from mail order suppliers so getting parts should not be a problem.

CONCLUSION

After I constructed the interface and worked out the bugs from the smoke test, I fired it up and anxiously awaited hard copy print from the M-200E. The interface had already worked like a charm on the CoCo and BRRRRATTTED out program listings. But when I printed RTTY at machine speed, there were numerous characters missing from the beginning of each line. Now I know that we all make typing errors, but these were too consistent. I started to watch the signals and LED's and it dawned on me that the characters were lost while the printer was printing a line and not receiving any characters. Clearly my serial to parallel converter needed a buffer to capture these letters while the printer was busy and then send them to the printer as fast as the machine was capable of receiving them during the next line of data.

This will lead into part two of this article, where I describe, the 16 character buffer between the serial to parallel interface. I found through hours of testing that 16 characters are enough buffer for RTTY operation, but the circuit can be expanded by utilizing bigger memory chips and cascading the counter chips.

For now, the serial to parallel converter should have some utility for many of you. I would appreciate your comments on the circuit so far. I hope the BBBRRRAAATTT of hard copy RTTY will add a little atmosphere to your shack and you'll read part two.

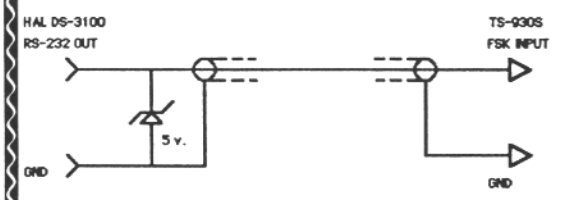

Fig. 1. Interfacing HAL DS-3100 and Kenwood TS-930s in the FSK mode.

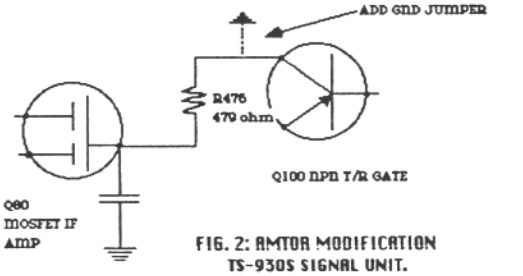

FIG. 2: AMTOR MODIFICATION TS-930S SIGNAL UNIT.

Table 1

S-1 Baud Rate Selection	ON
110	1
300	2
600	3
1200	4
2400	5
4800	6
9600	7

S-2 # of Bits Select		
# Bits	$S\text{-}2_1$	$S\text{-}2_2$
5	ON	ON
6	OFF	ON
7	ON	OFF
8	OFF	OFF
$S\text{-}2_3$ STOP Bit Select		
1 Stop Bit	$S\text{-}2_3$ ON	
2 Stop Bits	$S\text{-}2_3$ OFF	
$S\text{-}2_4$ Parity Bit Select		
Parity Bit	$S\text{-}2_4$ ON	
No Parity Bit	$S\text{-}2_4$ OFF	
Even/Odd Parity		
Odd	$S\text{-}2_5$ ON	
Even	$S\text{-}2_5$ OFF	

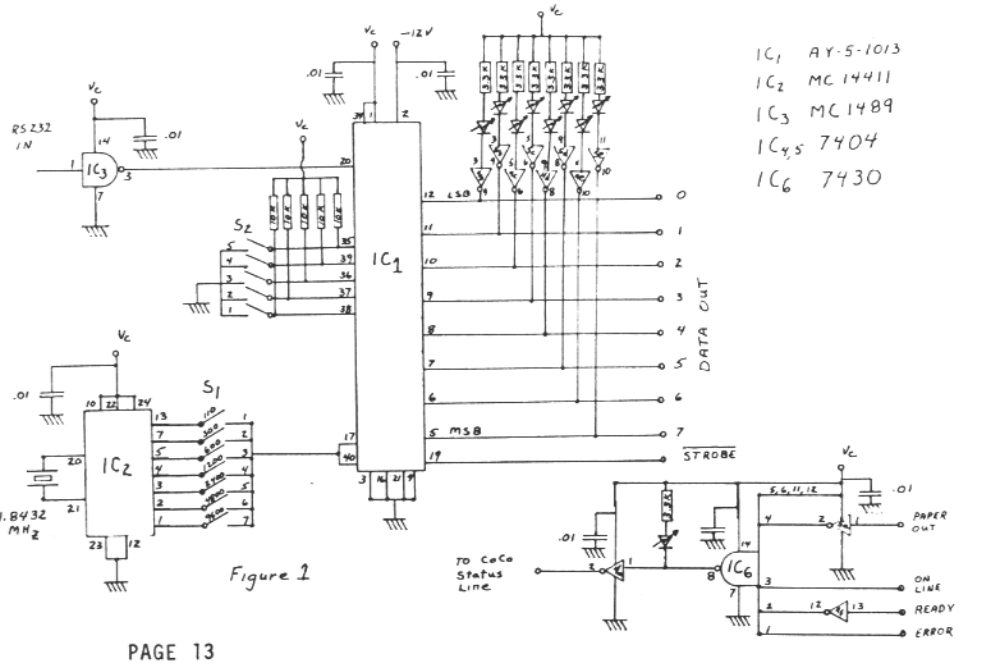

Figure 1

If any QRM shows up on frequency, notice how it may slow down transmission (as indicated by the front panel **ERROR** light being more active), but that no information is lost. If you allow the signals to go below the noise level for an extended period of time so that the two respective computers totally lose lock with each other, the master station (the one which initialized contact by calling the other's SELCALL) will automatically start calling the slave station's selcall until lock is re-established. At that point, if the slave station was the I.S.S. at the time contact was previously lost, the master station automatically will transfer control back to the slave station. Assuming both stations are operating properly, the first missing letter from the point of broken transmission will be picked up as an added space without so much as an added space within a word. This operation never ceases to amaze me. The first time I encountered it, I was the master station and I lost the other station in the QSB for what seemed like three minutes before he finally came back to a copyable level and not a single letter was lost. As in normal Baudot or ASCII RTTY, it is always good practice to touch up your receive tuning frequency (during a QSO) with the RIT control, never the main tuning dial.

After trying the marginal signal-path experiments, go back to normal power levels. Then pull your tone/PTT cable out of the transceiver for a few seconds and see what happens. When you plug it back in, you should re-establish lock quickly (if it is even lost) and no data should be lost.

BREAK-IN FEATURE

The long time RTTY user will really see some utilitarian value in the AMTOR break-in feature that is equalled only by QSK (high speed break-in) c.w.

When the other station is I.S.S. choose a convenient point between his sentences and then do an AMTOR break-in command (consult your operator's manual). This feature has the same effect as the I.S.S. hitting +? on his keyboard (i.e., it transfers control back to you and makes him the I.R.S. and now you the I.S.S.).

So there you have it. Don't blame me if you find the rest of Amateur Radio blasè by comparison after your first exposure to AMTOR. If you are like me, after about six months you will once again start going out "slumming" on the old modes, but only occasionally.

FUTURE

I would like to make a bold prediction that a majority of h.f. Amateur RTTY communications will someday be on AMTOR. I see AMTOR today being in the same relative stage of development that single sideband was in 1957. (I suspect that some of those fellows with the foresight to buy a Collins S-line in 1957 are still using them 25 years later.)

AMTOR offers the potential for error-free exchange of non-copy righted computer programs on the h.f. bands under conditions never thought possible. Also, mailbox operation on AMTOR makes much more sense because the sending station knows instantly that his message is being received properly. There are several European AMTOR stations operating unattended (under computer control) that are providing bulletin-board service that is vastly superior to any ASCII or Baudot system. With anticipated relaxation of FCC regulations in the future, our possibilities are only limited by our imagination.

CREDIT

At this point I would like to publicly extend my personal thanks to Peter Martinez, G3PLX, for his selfless efforts in making AMTOR a reality by adapting CCIR 476.2 (SITOR) specifications to a compatible mode for Amateur Radio and in developing the first hardware systems to prove this adaptation. I am sure that AMTOR would still be waiting in our future had it not been for Peter's work.

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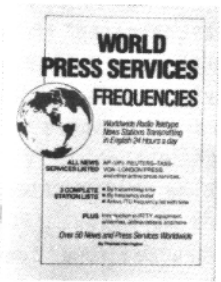

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Our thanks to Mike Lamb of Amateur Electronics Applications, Inc., for the fine article on AMTOR. Look for more Hams getting into this mode as well as packet radio soon.

Look for your editor/publisher to be on AMTOR before you read this (I hope, HI HI).

Coming next month will be the second part of the parallel line printer interface article begun in this issue as will be the conclusion of the article, Using the Kaypro II for RTTY. There will be an article on Bill Snyder, WOLHS "Contesting" complete with picture..We always need more articles and pictures so..please send them in....DE DEE, N6ELP.....

CLASSIFIED ADS

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

FOR SALE: MINT AEA AMT-1 AMTOR Terminal unit in original box. SASE to: E. Alline, NE5S, 773 Rosa, Metarie, LA 70005.

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WORLD RADIOTELETYPE FREQUENCY LIST-9th edition by Joerg Klingenfuss(FRG) New list of 2463 frequencies monitored in 1983. Frequency, callsign, name of station, ITU country symbol, times of reception and other details are included. All types of RTTY stations are listed-press, aero, wx, telex, military, diplomatic, maritime and others. New 9th edition now has hundreds of commercial SITOR-Spector (AMTOR) and FEC stations listed. 86 meteorological stations on 279 frequencies are included. 438 RTTY abbreviations. Authorized by Klingenfuss in USA. $12.95 PPD USA and Canada. Send for free RTTY list of publications, Universal Electronics, Inc., 4555 Groves Road, Suite 3A, Columbus, OH 43232.

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4. W3FV	4. W1DA	14. W3KV/	
5. KT1N	5. WB5HBR	VP9	
6. Y23DL	6. W2IUC	15. K2RYI	
7. K4AGC	7. K6WZ		
8. SM6ASD	8. W6JOX		
9. W1DA	9. KD8GC		
10. WB5HBR			

Lots of familiar calls in these lists and they are not there by accident. These are dedicated DXers and should be applauded for their interest and enthusiasm toward furthering the RTTY mode on an International basis.

AWARDS

DXCC #101, Tomohiko Kawaguchi, JH2PDS
DXCC #102, Leo Small, K4AGC
DXCC #104, John Wood, WB2VTD
DXCC #104 Willy Rogg, HB9HK

WAC #102, Eddie Justice, WA4JJY

Send all requests for awards to the RTTY JOURNAL office. Please include necessary requirements and postage. Thank you....

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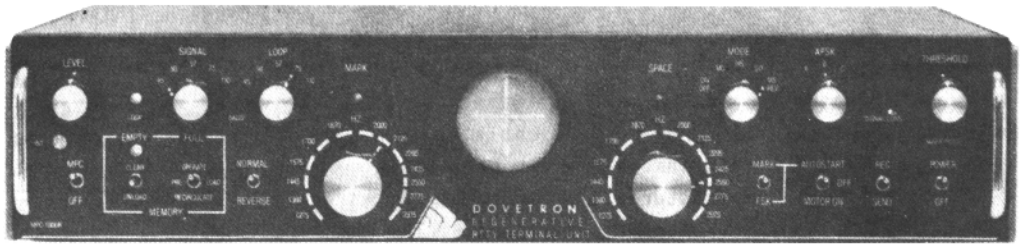

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