Modification for Printing Weather

Got trouble in printing copy of Weather Transmissions due to machine shifting and un-shifting at the wrong time?

I read with interest an Article by W8QMI on "Interpreting U.S. Weather Bureau Transmissions" in January '67 RTTY, and after printing some of the stuff, found that he was quite correct in saying that the machine had to be set so that it would not unshift on a space signal.

The following change on the machine (15 or 19), I am about to describe has been working for many months very well.

Remove the cover of the machine and then remove the four bolts holding down the typing carriage.

Now remove the typing carriage and set it on the back side with the bottom facing you.

About five and one-half inches from the left side, you will now find the "cut-out" lever (a finger two and one-half inches long with a hook on one end of it).

Depending on which position this lever is in, controls the machine in its function of automatic shifting from FIGS. to LTRS.

To facilitate printing from ham print to weather print, without lifting the carriage off each time, it becomes obvious that an extension of this cut-out lever, so that it may be changed from the front of the machine with the case on, is the answer.

Now remove the cut-out lever from the machine, by removing the one bolt that the lever swivels on.

Braze or solder to this lever, back of the screw hole which leaves about a half inch of metal, a new strip of metal one

CONTINUED ON PAGE 15

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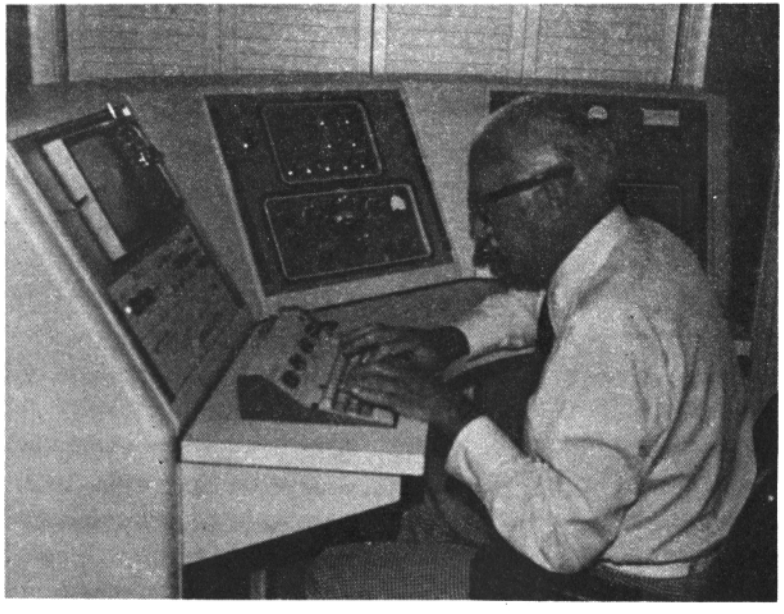
Address Correction Requested
RTTY JOURNAL
P O Box 837
Royal Oak, Mich. 48068

FIRST CLASS MAIL

RTTY JOURNAL
February 1975
EXCLUSIVELY AMATEUR RADIO TELETYPE
VOLUME 23 No. 2
30 Cents



"Rube", VE3RH

CONTENTS

Restruction or Destruction?

By now our readers must be aware of the new FCC docket for restructuring the amateur license set up and related privileges.

One main purpose appears to increase the number of amateurs which has been slowly declining. Whether the new proposals will do this or not will be hotly debated in the coming months and this is no attempt to join the debate EXCEPT for one thing.

Under the new proposal RTTY would be banned to all general and technician licensees. We have no exact figures but could safely say that 75% of all stations now on RTTY would be off the air. Without activity the others would soon leave also and all progress would stop. Teletype is the one mode where "build it yourself" is still predominate and certainly has developed more innovations and improvements than any other mode. Why are these present privileges being revoked -- I dunno -- and a letter from the ARRL states that at present they do not know either unless it is to offer more incentives for higher licenses. Probably there will be more answers from the FCC in the near future.

It is not too early however to start thinking and planning. Remember there are no manufacturers getting rich from RTTY equipment and no help can be expected there. They are much more interested in the 2 meter FM rigs that the "Communicators" will need. Our suggestion now is to write or contact your area ARRL director. At the time you read this they will be back from the annual directors meeting and should be well versed on the entire proposal. We have no doubt that the proposal reply by the ARRL will have a lot of weight on the final proposal adopted. Ask your director how he feels on the RTTY section - get a firm answer if possible. He represents you - let him know your thoughts.

Sane reasoning - not ranting is called for. There are a number of months left for rebuttal - but time flies - start thinking now. The JOURNAL will be happy to act as a clearing house and give publicity to any plans or ideas to prevent the demise of RTTY.

****

***

As of the date this is written, Jan 4th, we have not received our shipment of binders. All orders at the new $4.00 price are being held and will be shipped as soon as available.

***

After our little piece last month about the binders costing more than the magazines, we talked with Ev, K8JTT, and he said I was wrong because he files two years in each binder. Just puts the wire for the two issues between the last two pages of one issue and the first two of the next. Maybe everyone but me does it that way already but it works and cuts the binder cost in half. Only thing is that the last page of the front issue will be the last page of the second but that is no problem when you know it.

***

We are happy to publish another article on the UART by Irv Hoff, W6FFC. Irv has material for one or two more similar articles which we hope to run in consecutive issues. Nothing since the ST series of demodulators has created as much interest. For the builder without access to all the parts needed we recommend W6KS. (See classified section). Bert has assembled a number of the parts needed as a service and handles it almost at cost. We are glad to give this a free plug as we know buying a lot of these parts in small lots can be a chore, and sometimes impossible.

***

1974 was a bad year for us with back issues. Besides being out of the April-May and July issues we are now out of March and October.

***

60/100 Speed Clock for the UART.

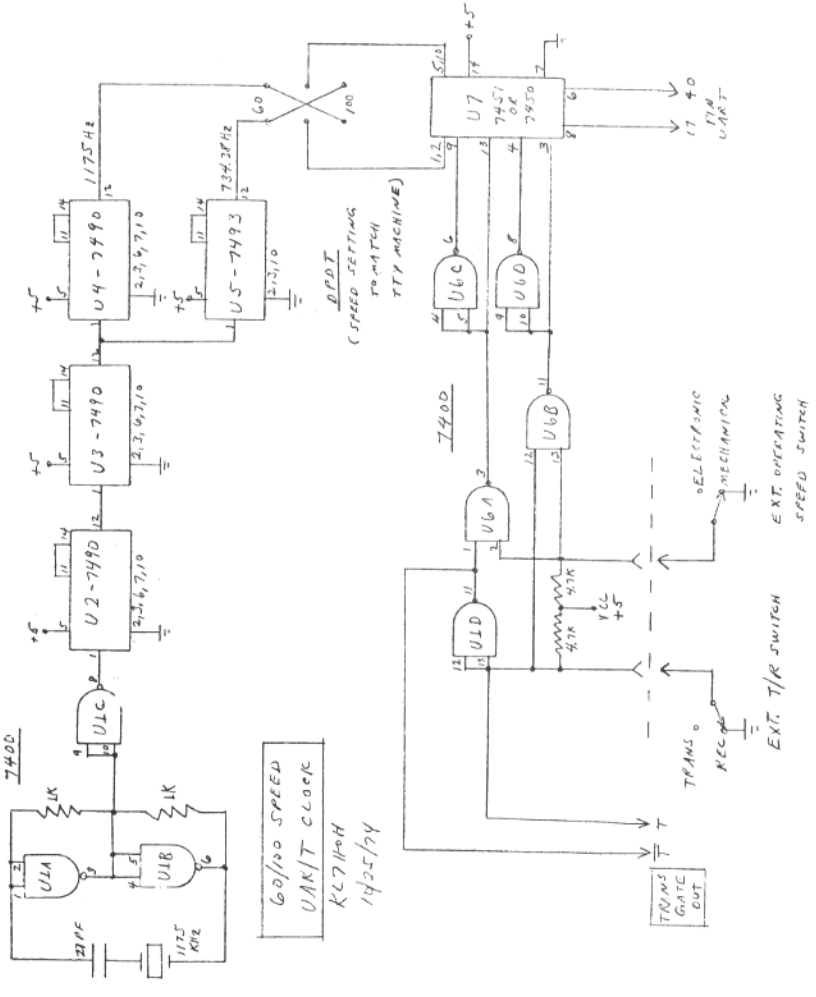
RONALD FINGER, KL7HOH,
3417 E. 65th Ave.
ANCHORAGE, AK. 99502

This is a simple crystal controlled clock source using one $2 JAN crystal and common TTL logic. With the setup you can operate at the TTY machine speed or at the electronic speed. The operating speed is selected by an external mode switch.

An external T/R switch or relay contacts take care of input/output clock changes. The DPDT switch should be mounted on the circuit board, since it is changed only if you change gears in the TTY machine.

The clock speeds are 1% high for 60 WPM and 1% low for 100 WPM, but this is small error and should not affect performance.

If used with the UT-2 or UT-4, IC2 and S3 (see UT-2 diagrams) are not used, Normal and inverted transmit gate outputs are available to control other circuits as required.



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The MAINLINE UT-2

IRVIN M.HOFF, W6FFC
12130 Foothill Lane
LOS ALTOS HILLS, CA. 94022

INTRODUCTION:

Computer technology (and hence data communications) is making exceptional progress. It is interesting to speculate where we might be in just a few more months, let alone by the end of the year.

Hand-held calculators are already as low as $17 for 8-digit types with floating decimal. Crystal-controlled wrist watches with digital displays are common-place with new manufacturers entering the market constantly. Estimates of household computers being available by 1980 are being revised downward almost daily.

The semi-conductor industry is turning out new MSI and LSI chips at a prodigious rate. Many of these will have a direct relationship to projects amateur RTTY operators will find not only fascinating but quite useful. Three such chips are the UART, the FIFO and the microprocessor. The last mentioned is the heart of the small minicomputers now showing up on the market. At least nine (9) manufacturers are making (or soon will be) such chips. The Intel Corporation under contract from Datapoint Corp. initiated work along this line in 1969, producing the 8008 chip and now the 8080. The Altair 8800 minicomputer (MITS Corp. in Albuquerque, N.M.) uses this versatile item in a product that several amateurs are already beginning to use.

THE UART:

This versatile chip was discussed earlier in RTTY JOURNAL (April 1974) with schematics to use if offered the following month's publication (May 1974). The UART is a 40-pin "super chip" that has important uses not only for RTTY but for computer operation as well. The UART is a composite that includes a transmit section, a receive section and a control section. It accepts asynchronous (serial, with start and stop pulses) input such as ASCII or Baudot and converts this to parallel. The transmit section then can take parallel information and convert to asynchronous output with start and stop pulses added. You can use this as an interface between the parallel information used in a computer and the incoming signal, or (as was shown in the earlier articles), use it as a regenerative repeater or as a "3-speed gearshift" by merely adding a second clock speed. The UART has several interesting additional qualities such as the verified start pulse and optional required stop pulse on each incoming character. Since the output of the UART always has a start and stop pulse added, there is no possibility of the printer itself getting out of synchronization. Those using the UART on the output of their demodulator report noticeable improvement in the quality of the copy, especially during quite marginal reception. Paul Blankmann (KH6AG) compared his Mainline ST-6 with UART, to a new and expensive (over $1,000) commercial demodulator. He said in his estimation the ST-6 did as well or better -- in any event it was a most worthwhile addition to his equipment.

THE FIFO:

The FIFO is essentially a storage register for parallel information and stands for **F**irst **I**n **F**irst **O**ut. It is also sometimes called a "silo" register since its action is similar to that of a silo that stores feed for livestock during the winter. Characters that are entered into the FIFO at one end are automatically transferred toward the other end. As a result the chip is very easy to use in conjunction with the UART to temporarily store characters until the printer is ready for another character. This same feature can be used to allow a steady output speed from normal typing which is somewhat erratic by nature.

THE MAINLINE UT-2:

The original UART article had subsequent schematics that showed how it could be used as a regenerative repeater for improved reception. A crystal-controlled clock was included as was an optional NE-555 clock. The circuit could be used as a "3-speed gearshift" if a second clock was added. The crystal-controlled clock was actually a synthesizer that could easily select any of six (6) different speeds.

The UT-2 expands the original circuit so that you can use the UART both for transmit and receive. Among other things this will allow the use of 100 speed gears on the printer, and then all legal speeds may be readily copied by merely changing the input clock speed to the appropriate selection. At the same time, the two clocks are automatically switched with one simple "receive-transmit" switch so the operator may transmit at any legal speed such as 60, 67, 75 or 100 WPM. A fringe benefit of using the UART for transmit is the perfect output signal regardless of the distortion the keyboard itself might have up to at least 45%. Assuming the operator is not only interested in improving his own copy but in transmitting the best signal he can, this is certainly one of the easiest and most satisfactory methods of doing both concurrently! A switch (S1) is provided to by-pass the UART for any reason that might appeal to the operator.

EXPLANATION OF UT-2 CIRCUIT:

The receive-transmit switch does several things simultaneously. It reverses the two clock speeds so you can transmit at the same speed you were listening to. It also changes the UART input from the incoming signal via the slicer output to the typing you are doing locally via the FSK output line. As a result, the output to the transmitter now comes from the UART rather than directly off the local loop. To retain the polar switching of the original FSK output, a 741 op amp has been added. This allows normal selection of narrow shift C.W. identification. If AFSK is exclusively used, this 741 may be left off as would the 47K, 5600, 4700 and 2200 ohm resistors. The 500 ohm pot and C.W. key would also be removed.

IC-2 is used only to switch the two clock speeds when going from receive to transmit. IC-1a allows the local loop to operate the UART during transmit and is inhibited during receive. IC-1b allows the slicer output to operate the UART during receive and is inhibited during transmit. IC-1c works all the time and is used primarily as an inverter/buffer. IC-1d allows the output of the UART to operate the printer during receive and is inhibited during transmit since the printer gets copy from the local keyboard while transmitting. Both IC-1 and IC-2 are open-collector types to allow the outputs to be paralleled for switching purposes.

The schematics included with the original article showed an optional switch to allow the operator to require the incoming character to have a stop pulse. The UT-2 uses IC-3 to provide this same feature, but in a rather different manner.

If the stop pulse is not present when expected, pin 14 of the UART goes high instead of remaining low. This is called the "framing error flag" by most of the manufacturers. One clock period later the "data available flag" at pin 19 of the UART goes high, which normally is used to transfer the character to the transmit side. This one clock period gives you ample time to reject the character if a stop pulse is required. If you open switch S-2 to require a stop pulse on each character received, and no stop pulse is present, pin 14 goes high and now the output of IC-3c goes low. This causes the output of IC-3b to go high which in turn causes the output of IC-3a to go low. This output is applied to the UART "reset data available" pin 18. This prevents pin 19 from going high at the end of that one clock period. As a result, the UART does not think it has received a character and the data is not transferred to the transmit section at all. The framing error flip-flop at pin 14 stays high until some character comes along that does have a valid stop pulse at which time it is set low again, allowing the character to be transferred to the transmit section normally. This 7400 (IC-3) circuit takes the place of the universal schematic offered with the original article. That had been used to reset the master reset if the framing error flag went high. There are two UARTS that do not reset in that manner so this has proven to be a superior circuit for service with any of the six (6) different types of UARTS tested. Note: We still regard the Western Digital UART as unsuitable for amateur purposes. It continues to fail when characters with no stop pulse are received. Rather than printing correct characters if the stop pulse is not required it prints garbage. If requiring a stop pulse and none is present, the Western Digital UART does not consistently reject the character and usually prints garbage. None of the other types have failed this test. The Western Digital also will lock up when voltages are first applied, under some circumstances that do not affect any of the other units tested.

When a valid character is received, the "data available" flag on pin 19 of the UART goes high one clock period after the stop pulse has been sampled. This indicates the data has been placed in the output holding register and now appears on pins 8-12 if using 5-level Baudot code. When pin 19 goes high, this causes the output of IC-3d to go low, initiating two things to happen: (1) pin 23 now goes low and this causes the transmit section to accept the data on the receiver output pins 8-12 and (2) causes the output of IC-3b to go high, which causes the output of IC-3a to go low, resetting the data available flip-flop, causing pin 19 to return to its normal low, and this in turn

again puts a normal high on pin 23. Since the data on the receive output lines (pins 8-12 remains stable until the next character is received, there is no problem at all with timing or with stable data.)

Several of the pins on the UART are not used at all on the UT-2 configuration. This is a 'MOS' device and has internal pull-up resistors.

Pins 37 and 38 are used to select the type of signal being processed and are shown connected for 5-level Baudot. All eight (8) of the data lines are shown connected for eventual possible use on 8-level ASCII code.

Pin 36 merely selects between 1 unit stop pulse and 2 units of stop pulse. With the one (1) unit selected as shown, incoming signals running as fast as 390 opm may be copied normally vs. 341 opm for the 2 units of stop pulse. Normal 7.42 units can go 368 opm at machine speed.

THE MAINLINE UT-4:

Another article will follow next month on the UT-4. This unit takes the present UT-2 and adds the FIFO storage register plus an up-down counter with status indicator (meter) that shows the amount of characters in the FIFO. The UT-4 also has a variable output delay so the operator can type at a speed convenient to him, and then by selecting the output delay to retain some characters in the FIFO the majority of the time, can have steady machine-like output speed. Among other things this gives most demodulators a better opportunity to copy the signal without such jerky response and pauses between characters. At the same time, you can if you like run the keyboard at 100 WPM for easier typing, and then output at normal Baud rate with nice steady output rate. This resembles computer control and within a few seconds it is quite obvious to the listener you have some type of unusual device in use.

CLOCK SPEEDS:

The reader can refer to the UART schematics in the May 1974 RTTY JOURNAL for suitable clock speeds. If the Mainline XB-6 synthesizer is used, a second section would be added identical to all following the output of the 7490 decade divider, which then would also be connected to the same output. This would give two highly accurate but independent clock speeds -- one for the UART input and one for the UART output.

USES FOR THE UT-2:

The UT-2 allows use of the UART for receive as a regenerative repeater as well as a speed converter if desired. During transmit, it allows poor teleprinters to have excellent output with less than 1% distortion. If a minicomputer and/or ASCII solid-state keyboard is ever added the UT-2 will still be a necessary interface to allow parallel data to be processed.

AVAILABILITY OF THE UART:

There are a number of UARTS available. The one most commonly used is the TI TMS-6011NC. GI has the AY-5-1012 and the AY-5-1013. AMI has the S-1883. Western Digital has the TR-1602B and the TR-1402B. SMC Microsystems has the COM-2017/H. Any of those mentioned work satisfactorily with the UT-2, but note previous comments concerning the Western Digital UARTS when no stop pulse is present.

ONE THING TO CHECK:

After hooking the ST-6 FSK output to the input of IC-1a as shown, check the voltage at pin 2 of the IC-1a. It should be somewhere near zero, but in any event we should prefer it to fall in the range of plus 0.4 to minus 0.4. volts. If outside this range, change the 8200 ohm resistor to some value more suitable. Once selected for your particular demodulator's loop system, no further checks or changes should ever be required.

P.C. BOARDS:

At present no P.C. boards are generally available. You will wish to read the article on the UT-4 prior to deciding which circuit might please you the most. By that time we hope to have additional information available relative to P.C. boards.

ACKNOWLEDGEMENTS:

My original interest in UARTS commenced when Howard Nurse demonstrated one in the fall of 1973. A number of people on autostart frequencies immediately became interested and much of the information learned during the past 18 months has been what might best be termed a joint effort. The majority of work was done by Howard, W6LLO, with independent work done by Paul Satterlee, Jr. WA5IAT. Howard was using the AMI chip, Paul the TI, and my efforts centered originally on the GI. As the various minor differences became generally known, we kept each other rather well informed as to progress being made.

A large number of others have followed this work with great interest and have been most helpful in contributing with information, suggestions and comments. These have included WA5NYY, K5UAR, K4CZ, WA7RQV, WA7HJR, WB6WPX, W6OXP and K4EID.

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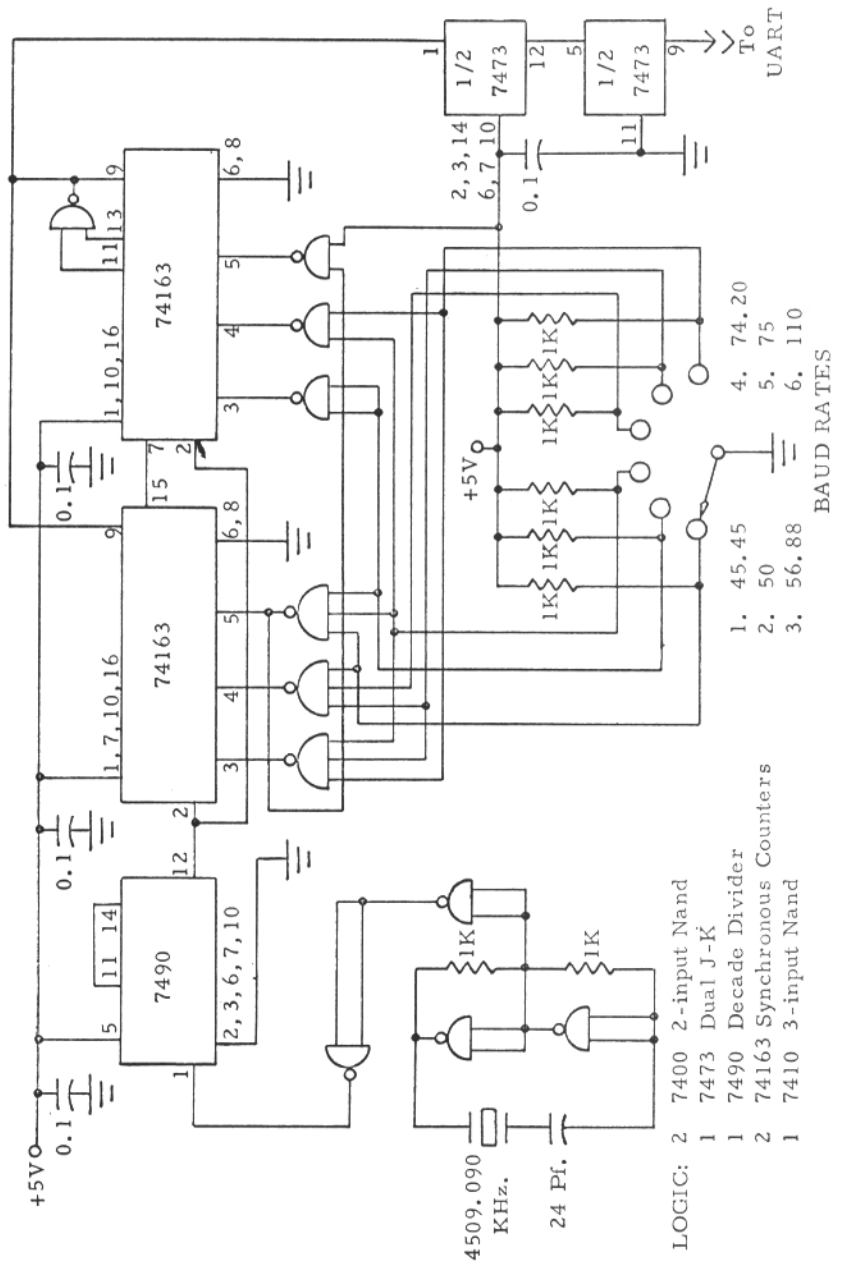
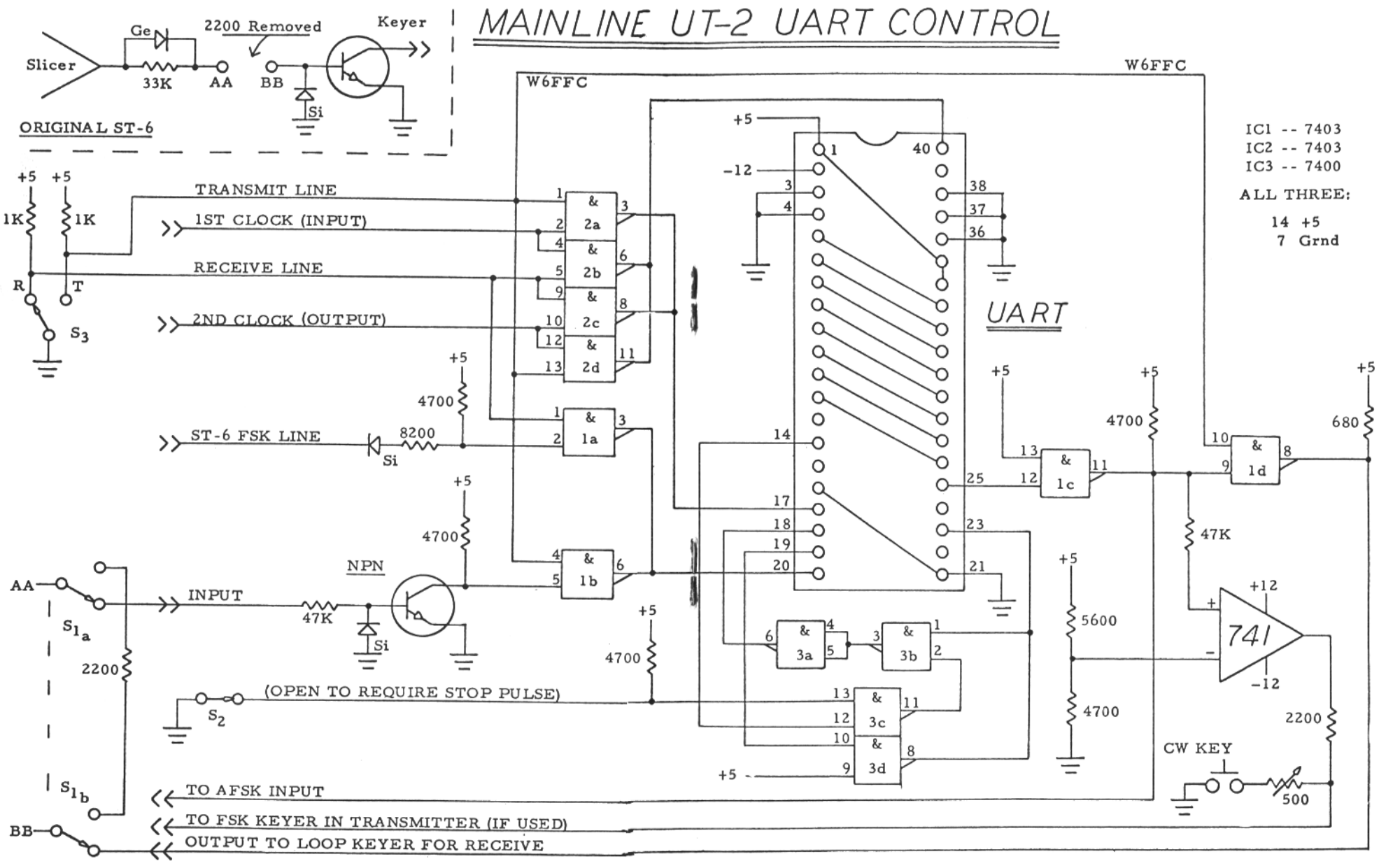
MAINLINE XB-6 UART CLOCK



W6FFC


MAINLINE UT-2 UART CONTROL
ORIGINAL ST-6
Slicer
Ge
2200 Removed
Keyer
33K
AA
BB
Si
W6FFC
IC1 -- 7403
IC2 -- 7403
IC3 -- 7400
ALL THREE:
14 +5
7 Grnd
UART
TRANSMIT LINE
1ST CLOCK (INPUT)
RECEIVE LINE
2ND CLOCK (OUTPUT)
ST-6 FSK LINE
8200
4700
1K
R
T
S3
NPN
INPUT
47K
AA
S1a
S1b
2200
BB
S2
(OPEN TO REQUIRE STOP PULSE)
TO AFSK INPUT
TO FSK KEYER IN TRANSMITTER (IF USED)
OUTPUT TO LOOP KEYER FOR RECEIVE
5600
680
741
+12
-12
CW KEY
500

RTTY theory & applications.

RON 'RG' GUENTZLER, W8BBB
Route 1 Box 30
ADA OHIO, 45810

Baudot vs. Murray Revisited, or More of the History of Printing Telegraphy

Three months ago in this column (1974 NOV, pp. 12-13), we gave a brief history of the development of printing telegraphy (Teletype) from the Morse telegraph in 1840 thru the introduction of the stop-start concept by Krum in 1907. This month, we will briefly review the state-of-the-art ca. 1900 and then take the development up thru the introduction of the Model 15 in 1930. The following material is extracted from:

"The Teletype Story", Copyright 1958 by Teletype Corp. - it was sent to us by an "anonymous" donor.

In 1900, two systems of printing telegraphy were in use. Both used five-unit codes. The Baudot code (present CCITT International Telegraph Alphabet #1) was sent from a five-key keyboard. The Murray Code (present CCITT International Telegraph Alphabet #2 - the one required for amateur use, by law) was sent from a keyboard similar to a typewriter (the "standard" Teletype keyboard).

The principle objection to both the Baudot and the Murray systems was that they were synchronous systems. They did **not** use the stop-start arrangement used on all current teleprinters (Murray and ASCII); that is, the receiving machine had to continuously operate at exactly the same speed as the transmitting machine - each character immediately followed another with no pause between them - if one machine got even one pulse out of step, all copy that followed was incorrect until someone intervened (with stop-start systems running at machine speed, lack of synchronization will "junk" a few characters, but the machines will eventually, automatically get back into step - with a stop-start system hand operated, only one character will be lost and then synchronization is automatically re-established).

In 1902 an electrical engineer named Frank Pearne received financial backing by Joy Morton (head of the Morton Salt interests) to develop a printing telegraph system. After a year, Pearne gave up the work and it was continued by Charles Krum, a vice president of the Western Cold Storage Co., operated by Joy Morton's brother, Mark. In 1906, Charles Krum's son, Howard, joined his father in the development work. By 1907 the results were so promising that the Morkrum Company (named for Morton and Krum) was formed to commercially further the development and marketing. Howard Krum's major achievement was the development of the start-stop concept to solve the synchronization problem. He used the Murray code, preceded with a start pulse and ending with a stop pulse (thus synchronization is established with each character).

The first working model of the Morkrum machine was tested on a telegraph line in 1908.

In 1910, the second largest telegraph company in the U.S., the Postal Telegraph System, bought teleprinters made by Morkrum and had them installed on its New York to Boston circuits. Postal Telegraph's major concern was whether or not the Morkrum machines would perform well in bad weather - like their salt, when it rained, the messages poured thru! By 1912, Postal Telegraph had eight circuits working with Morkrum equipment, the longest being 1000 miles from New York to Chicago. (The machines probably operated at 20 WPM.)

In 1912, Western Union had six circuits in operation using the Morkrum equipment. Several railroads then followed suit.

By 1914, Morkrum had a tape perforator system in use for off-line preparation and on-line transmission. Its first major use was by the Associated Press to distribute news stories to page printers at its member newspapers in the New York area.

The name "Teletype", and the scroll symbol were introduced as part of the advertising promotion on the Model 11, introduced in 1921. The Model 11 operated at 40 WPM. It used a type wheel and printed on paper tape. One of the advertising flyers for the Model 11 stated: "Teletype - Don't Say it - Don't Write it - Print It."

The Model 12 page printer using type bars was introduced in 1922. It was the first machine placed into widespread use by businesses on private circuits. This machine was so rugged that its first installation - 37 machines put in use for the Chicago Police Dept. in 1922 - was not replaced until 1956. Approximately 12,000 Model 12's were sold.

In 1923, the first Teletype by radio (RTTY) messages were sent 30 miles from the factory to the home of the president, Sterling Morton.

In 1924, a patent conflict between the Morkrum Company and the Kleinschmidt Electric Company, which also manufactured teleprinters, led to a meeting of the interests and an eventual merger under the name Morkrum-Kleinschmidt Corporation; Sterling Morton was the president, and Edward Kleinschmidt and Howard Krum were the vice presidents.

The Model 14 type bar type printer was introduced as a rugged, low-maintenance machine in 1925. The development resulted from requests by the telegraph companies who wanted to have teleprinters on all their circuits. Because it printed on paper tape, the machine was simpler than a page printer, and it could handle messages a bit faster because it did not have to carriage return or line feed.

The first reperforator was built in 1925. The production version came in 1928, and the typing reperforator arrived in 1940.

For simplicity, the company's name was changed from Morkrum - Kleinschmidt to Teletype Corp. in 1928. 15,500 Teletype instruments were made from 1918 to 1927, 12,700 were produced in 1928, and 25,200 were made in 1929.

Teletype Corp. was bought by the American Telephone and Telegraph Company in 1930 and was made a subsidiary of its Western Electric Company.

The Model 15 was developed and placed in volume production in 1930 at the request of the Bell System. It was quieter and less bulky than the Model 12, and, unlike the Model 12 in which the platen moved, in the Model 15 the platen was fixed and the type basket moved. The design of the Model 15 was patterned after the excellent Model 14.

The Bell System Teletypewriter Exchange Service - TWX- was introduced in 1931 using the Model 15. The Teletypesetter was introduced in 1932. It uses a six level code to permit upper and lower case letters; it is the forerunner of the ASCII code introduced in 1968. Teletypesetter perforators are still widely used to prepare tape for the latest electronic photocomposers.

VHF News

We have very little VHF RTTY news right now, so we will wait until next month when, hopefully, we will have a lot to report. Please keep the information coming.

73. ES CUL, RG.

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BACK ISSUES

New subscriptions and classified ads are cash in advance as we have no method for billing. New subscriptions will be started with the current issue and one back issue, if requested. Please do not ask us to start any further back than this. Back issues - if available - may be ordered at 30¢ each at time of subscription. The JOURNAL is mailed about the 20th of the month preceding the dated month. May and June are a combined issue and July-August is a combined issue.

The ONLY back issues available are listed below. 30¢ each.

1971-JUNE-JULY-SEPT.- [3]
1972-APRIL-MAY-SEPT.OCT.-NOV.-DEC.-[6]
1973- COMPLETE- [10]
1974-JAN.-FEB.-SEPT.-NOV.-DEC. [5]
1975-JAN.-

RTTY Binders are out of stock. Another supply will be available after January 1st but the price will be $4.00 each and $5.00 each to overseas subscribers.

RTTY JOURNAL
Box 837
Royal Oak, Mich. 48068
Editor & Publisher 'Dusty' Dunn, W8CQ

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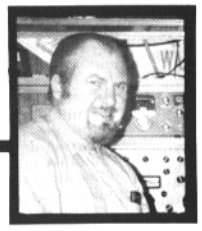
RTTY-DX



JOHN POSSEHL - W3KV
Box 73 Blue Bell, Pa., 19422

Hello there. . .

As we sit here on the last day of 1974 trying to get this column started we are inclined to think back over the events that took place during the year. Politically it was a year of change and turmoil and economically it was one of the worst in a couple of decades. Of course the views stated above would not be agreed to by everyone, it depends upon where you are and what you do. However, we do think that one statement we can make that all interested in this particular phase of our hobby will agree to is that 1974 was a great year for RTTY-DX. Hardly a month went by when someone did not show up from somewhere to cause feverish activity on the bands, and the old year departed in a blaze of glory, as we shall see.

In review, some of the stations that were responsible for one of the best years for RTTY-DX were: VP2MKH, JD1ACX (Bonin), JD1AGZ (Marcus), DM3ZOL, VP1MT, ZF1TV, HP1AH, XV5AC, XW8HJ, HZ1SH, 4U1ITU, XT2AE. SV1EC, DU1POL, 3A2GX, TU2DU, C3 1CA, VK9XW, YU3EM, TF3IRA, OX3XX, HC1DL, CO2HZ, FY7AO, PJ2CR, plus of course the dozens of countries that are normally active on RTTY.

first week we were alerted to activity from Dick, WA3JCT/ZP5, located in Asunsion. His signals were of excellent quality to all points from a Heath SB Line and Quad antenna. Dick also created some ~~king sized pili-~~ king sized pile-ups in the Volta Contest. Activity is planned for approximately two years from this rare DX location so all that are interested will have ample time for a contact. When Dick is not actually operating, his equipment monitors the Auto-Start channel continuously so it is possible to pass a message by getting precisely on 14075 khz. Dick is especially thankful to Bernie, W7AHW/4, and Irv, W6FFC, for their help in getting him going on RTTY. QSL to --

LTC. R.R. Manahan
USMILGP Paraguay
APO New York, N.Y. 09881

No sooner had the din abated from Dick's initial activity when everything broke loose again the following week with excellent signals from Carlo, 5U7BA. Rumors had been rampant for months that activity would start up from this rare country, well it is here now and with almost daily activity. Carlo uses an Olivetti machine, an ST-5 TU, and a homebrew TX. QSL cards go to --

P.O. Box 877
Niamey, Niger Republic

What follows is a short Odyssey on the most recent travels of Sid, VP2KH, and we are more convinced than ever that this fellow is some sort of "Superman." Sid arrived in New York in mid December and spent several pleasant days with Knobby, W2PLQ, and Bud, W2LFL, out on Long Island. Your scribe was also pleased to have had a chat with Sid via the "landline." We did not know at the time however that he was hobbling around on what appeared to be a wrenched foot which occurred during his last few days on St. Kitts. Sid left New York on a Saturday and we were amazed to hear signals from G4CTQ, his call in England, on Monday. Also, what was thought to be a very sore foot turned out to be a broken foot upon X-Ray examination in England and necessitated a cast from toe to knee. This would have incapacitated most people for at least a short recovery period, but Sid is made of sterner stuff. After a few days in Lincoln he packed all the RTTY and RF gear, his XYL, two children, and himself, (no small item) into one of those mini cars you are familiar with and headed North to Scotland where he was active from the town of Scorne until about the 2nd of January to give Knobby and all others that needed it a contact with the rare GM prefix. From St. Kitts, to New York, to Lincoln, having the leg set in plaster, and then up to Scotland all took place in about two weeks time. I'm quite exhausted just writing about it. Cards for G4CTQ, GM4CTQ/p go to -- Sid May 77 Chaucer Drive
Lincoln, England

When John, G3IGG, was located in England he was like most of us, hunting the DX on RTTY. However things have changed for John and with the call GW3IGG he is very much the hunted. He is the only active station from Wales at the moment that we know of and a rare catch indeed. John runs quite low power so you may have to dig under a few layers of QRM and his shift is about 450 hz, but he has been quite active at around 1430 and 1800 Gmt particularly on week ends. His new QTH is --

John P.G. Jones 40 Lower Quay Road
Hook, Haverfordwest
Pembrokeshire, Wales

The Volta Contest came off on schedule of course. Conditions were somewhat mixed with little or no openings on 10 and very short openings on 15. This set of conditions kept most everyone on 20 most of the time with the usual QRM only compounded. Hours of darkness shifted the load to 40 and 80 where you could pick up many multipliers if you could read them in the broadcast QRM. Some of the more rare activity was furnished by JD1ABH, HI8XRM, YU2CAL, OY1M, TF3IRA, PJ2CR, UK2GAX, ZS3B, ZS1FD, and WA3JCT/ZP5. Oceania seemed to be quite scarce but Eric, VK3KF, was booming in here around mid-day via the long path.

Now we may take a few moments and think about what may be in store for RTTY-DX in 1975. Last year we made a few predictions at about this same time and it seems to me that we were 50 percent wrong, or right, depending on how you look at it. Anyway, activity from ZD3M, and Nauru, C2 1 -- never did take place as far as we know. Some of the boys are planning a few things for the coming months however so keep those printers in good shape. Come March or April and probably to coincide with one of the Contests LX1JW, DL8VX, and HB9HK intend to DXpedition to Monaco for some 3A2 activity. Possibly around the same time or sooner there may be some bands emanating from the Caribbean area from some of the islands never previously on RTTY. If the info cannot make the column look for QST tapes.

We understand that OE2EM/YK went back to Austria, possibly for the holidays, and this accounts for the lack of activity from this area in recent weeks. However, Ernst is due to be back and perhaps already is so keep watching.

A very excellent RTTY Magazine is published jointly by the German and Swiss RTTY Groups. All in German of course but with excellent technical articles using Integrated Circuits and sections for VHF, RTTY-DX, FAX, and Contest information. DJ8BT, DL8VX, or HB9ATV can pass you the details on how to subscribe if you are interested.

Year end WAC certificates were issued to the following stations:

Nr. 234 Don Peters W9IIF
Nr. 235 Bruce Frahm WAØTAS

DX-RTTY February 1965

OE2WSL in Salzburg has been reported active. DL3IR reports TI2I0 getting ready to get on RTTY. G2HIO says there are at least four stations on 80 meters from North Ireland. WB2WUV is operating from the S.S. Hope anchored at Conakry, Republic of Guinea/7GI. Jean, FG7XT, plans FS7 activity very soon now. W4AIS and W7UKH are the latest to make WAC.

Thanks to -- 'W3DJZ, W4AIS, K6WZ, W7BCT, ON4BX, and many more for their valuable information.

73 de John

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"JIN", JA1ACB

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Reprints of UART Articles -

Through the generosity of "Clyde" K7WTQ we have received a supply of reprints on both UART articles from the April & May issues of the Journal which are now out of stock. If you need this reprint just send a stamped, addressed envelope and we will be happy to send a copy to you.

CLASSIFIED ADS- 30 words $2. Additional words- 4¢ ea.

Cash with copy, Deadline 1st of month.

MORE RTTY! ONLY HAM RADIO MAGAZINE consistently brings you more RTTY articles and better RTTY articles than any other general amateur magazine. You need RTTY Journal, but you need HAM RADIO also. $7.00 per year, $14.00 for 3 years. Ham Radio, Greenville, NH 03048.

OA-5 SOLID-STATE TU. See February and September issues of "RTTY Journal." Drilled and plated boards, $15.00; board with parts, $100.00; complete unit, ready for air, $210.00. FOB. WA8ETX, Ken Simpson, 3700 Mountview, Alliance, Ohio 44601.

HAL COMMUNICATIONS CORP.: HEADQUARTERS for MAINLINE Solid State RTTY Equipment. In demodulators, choose from the incomparable ST-6 or, for a low cost beginning in RTTY, the ST-5. Tailor either to your requirements by selecting the 425 Hz press discriminator, the AK-1 AFSK oscillator, and table or rack mount cabinets for the ST-6, or the AK-1 AFSK and the ST-5/AS autostart for the ST-5. Full details available in our current catalog. Charge your purchase to your BankAmericard or Master Charge account. HAL Communications Corp., Box 365RJ, Urbana, Illinois 61801. Phone 217-359-7373.

FOR SALE: MINT MODEL 32ASR with commercial paper winder, $350.00. Also ST-6, Hal Constructed with AKI. $250.00. Call W1ODI, (617)-944-0443.

WANTED: MODEL 33 & 35 EQUIPMENT. Complete or partial units, any quantity. Will pay shipping. Terminal Systems, Inc., 11300 Hartland St., North Hollywood, CA 91605 (213) 769-6772.

RTTY VIDEO DISPLAY UNIT: 1000 characters, plugs into loop or logic circuits. ASCII or BAUDOT available. Works with any TV set. Leland Associates, 18704 Glastonbury Rd., Detroit, MI 48219

NEWS-NEWS-NEWS - Amateur Radio's Newspaper, "Worldradio", Trial subscription-Two issues for one dollar. "Worldradio" 2509-F Donner Way, Sacramento, Calif. 95818.

WANTED: CV-483/URA-17 terminal units. Any condition. UGC-20, 25 or 43 Compact KSR. Mark III keyboard for 28KSR. Hank, W6SKC P.O. Box 338, South Pasadena, Ca. 91030

Update your RTTY station with Hale Electronics' new solid-state character generator, Model CG-256. Uses PROM to generate 32 character RTTY message (5-level, Baudot, 2-bit stop), or 256-bit cw message. Just the thing for WRU or CW ident. Directly compatible with ST-6. Slight modification required on ST-5. Loop compatible with external reed relay. May be remotely controlled. Available in kit form (with PROM programmed to your specs.), wired and tested model, or PC board only. QSL card or letter brings full descriptive info and prices. Inquire today. Hale Electronics, P.O. Box 682, Cape Girardeau, Mo. 63701.

HAL COMMUNICATIONS CORP. announces the DKB-2010 Dual Mode Keyboard. Provides flawless transmission of RTTY and Morse Code with standard 3 character buffer and optional 64 or 128 key buffer. Call letter identifier and "Quick Brown Fox" sequence standard. Write for detailed spec sheet. HAL Communications Corp., Box 365RJ, Urbana, ILL. 61801. Phone 217-359-7373.

SALE: MODEL 28 COPYHOLDER TYPE 164024, offset copyholder for a 28 Cabinet type LAC or LAAC etc. unused $5.25; Model 28 Electric paper winder type PW-201 BR 115 V 60 Cy Unused $65.00; Distortion Test Set with Scope Type Stelma TDA-2, 115 V 60 Cy good $38.00; Terminal Unit, Teletype Converter type TH-5 TG unused $49.95; Kleinschmidt allen wrench on 12" long handle for those hard to get at places, Unused $1.00; Distortion Test Set Type TS-2B/TG 115 V good $58.00; Tape, Perforator 11/16 oiled, Red with 2" center hole, Box of 10 Rolls, $3.60 or case of 40 Rolls $9.95; Model 28 LESU units in steel housing Unused $33.00; Model 15 Platen unused $4.50; To speed your order please enclose sufficient postage. ATLANTIC SURPLUS SALES CO. 1902 MERMAID AVE. BROOKLYN, NEW YORK 11224 Tel: 212-266-2629.

TECH MANUALS---$6.50 each: TT-63A/FGC, CV-591A/URR, TS-2/TG, CV-116; Following manuals $8.50 each: TT-47/48, R-388/URR, FR-114/U, USM-50, 51J4; following $10.00 each: R-390A/URR, SRR-11, 12, 13, USM-32, URR-35C; Model 14 TD manuals $2.50 each. Other manuals now available: (limited quantity) UGC-38, 40, 41 $13.50, TT-298A/B, TT-299A/B $15.00, WRR-2/FRR-59 $22.50, WRR-3A $18.50, UPM-70, 70A $20.00. Immediate delivery. Prices postpaid in USA only. Thousands more in stock. Send 50¢ (coin) for large list. W3IHD, 7218 Roanne Drive, Washington, DC 20021.

SELL: 230 ISSUES, 1952-1970 of Ham Radio, CQ, QST, 73, $27.50 PP. Want: Pre 1974 RTTY JOURNAL, Kleinschmidt ADS-321 or AN/FGC-140 circuit boards. TV-2 tube tester. Joe Ottinger, 106 Sheridan Ct. Leavenworth, KS. 66048, (913) 651-5832.

WANTED: MANUALS FOR TT-253/UG and Ras Rcvr. Looking for Navy type RBL receiver. D.R. Kelley, K7CE, 7307 S.E. Thompson Rd. Milwaukee, OR. 97222

NS-1 PLL Demodulator (Oct. '74 Journal) complete unit wired, tested $25.95 ppd. less switch, meter, powersupply. Board only undrilled $4.75. Nat Stinnette Electronics, Box 1043, Tavares, FL 32778

DAYTON HAMVENTION at HARA Arena April 25, 26, 27, 1975. RTTY Forum scheduled on 27th. Write for information if you have not attended the last two years to HAMVENTION, P.O. Box 44, Dayton, Ohio, 45401.

MODEL 19 "CRANKS". $1.00 ea. postpaid. Joe, W6RLL, 16808 W. Goodvale Rd. Saugus, CA. 91351

SALE: MODEL 28 TYPING REPERF, type 315/UG code LPR-35, or TT 317/UG code LPR-37, tape data 11/16" wide, Chadless or fully perforated; Good $25.00 each. Model 28 Transmitter-Distributor type TT 334/UG code LXB-9, Good $25.00 each. Tuning forks 96.19 VPS. or 120 VPS. Unused $2.00 each. Mite PD/82U 115VAC, 60 cy. Synchronous motor with connector Unused $18.00 each. Reader, High Speed Ferranti model Mark II or III Good $15.00. TT Socket wrench 5/16" with 12" long handle. 75¢. 60 WPM set gears for Model 14 TD 1800 RPM Unused $4.75. . . Model 14, 15, and 19 Machines available, Also LORENZ LO-15 ASR and KSR (IT'S A REAL BEAUTY). Send us a list of your needs. ATLANTIC SURPLUS SALES CO. 1902 Mermaid Ave. Brooklyn New York 11224 Tel. (212) 266-2629.

CLASSIFIED ADS-

SELL OR TRADE: (Make Offer) 15 cases - 32 rolls per case - 7/8 buff colored tape. Want: 3 speed shift and TD for 28KSR. W.R. Pratt, W9VBU, 9716 Wilcox Dr. Belvidere, IL. 61008

DESK TOP 28KSR MARK III, 3 speed $275.00. Essco TU-7 complete, 850/170 and extra parts, $85.00. Bell/Tel-Model 19 like new with spare parts, $75.00. All FOB. A. Roth 10 alta Vista, Ringwood, N.J. 07456

FOR SALE - DRAKE L4-B Amplifier, like new, mint condition, $575. FOB J.W. Vonderschmitt R.R. #3 Box 35 Washington, Indiana 47501 (812-254-1770)

HAL COMMUNICATIONS CORP. announces the new new RVD-1005 Visual Display Unit, with the features of the proven RVD-1002 and some new features to boot, such as: Automatic CR-LF on space after 36th character (prevents splitting of short words), and speed indicator circuitry which times the incoming signal and causes an LED to light to show which speed switch to select. Loop and low level inputs for compatibility with any TU. Combine the RVD-1005 with the DKB-2010 or the RKB-1 for the ultimate in noiseless, reliable, reception and transmission of Baudot coded TTY. Bank Americard and Master Charge accepted. HAL Communications Corp., Box 365RJ, Urbana, Illinois 61801. Phone 217-359-7373.

HAL COMMUNICATIONS CORP. will show THE line of electronic TTY equipment at Miami and Wheaton Hamfests in January. We'll look forward to visiting with our customers there.

CIRCUIT BOARDS: CW ID October Jrnl. $8, Frequency Standard February 1974 Ham Radio magazine $8, Digital Clock November 1974 QST $8, RTTY Memory January 1975 Ham Radio magazine $10 -- have obtained a supply of the HGSM Clare relays needed and will reserve one for each Memory circuit board available, add $2 for this relay if ordered with board, $2.50 if ordered later. Last call for counter boards April 1974 RTTY Jrnl, still $10 a set. Have no more AFSK or Digital Autostart boards. All boards high quality G-10 epoxy, plated, but undrilled. Sent postpaid First Class mail in US and Canada only. Bert Kelley, 2307 S. Clark Ave., Tampa, Florida. 33609

TELETYPE, KLEINSCHMIDT, MITE, Gears, manuals, machines, parts, tools, cranks, tuning forks, motors, keytops, pallets, toroids, re-inkers. SASE for list. Typetronics Box 8873, W4NYF, Ft. Lauderdale, Fl. 33310. Wanted: parts Manuals, late machines.

FREDERICK ELECTRONICS MODEL 1300 electronic storage units. New govt. surplus, requires an external time base. w/manual $175. Northern Radio regen repeater Model 349 35 to 9,600 baud solid state new w/manual $75; Frederick Electronics Model 1309 Universal line isolation relay unit. Solid state new w/manual $95.; ST-6 Factory wired in Aug. of 74 Has all options. Mint condition w/manual $275. Logic power supplies used good checked out, pos 24 neg 24 pos 48 and pos 5 volts Made for Control Data 19 inch rack mount 2 percent regulation. Shipping weight 25 pounds. $15. Control Data Vertipunch any level modern w/manual $55. Control Data Optimatic photo-electric reader any level w/manual $35. Special on reader and punch combination $75. Lou Carbaugh P.O. Box 398 New Cumberland, Pa. 17070

FOR SALE: MODEL 28 TELETYPE EQUIPMENT. Standard, deluxe and compact ASR; KSR; RO; R-T ROTR; Modification kits, parts available. Also model 15KSR and RO, 19, - 14 TD, 14ROTR. Model 28 machines and parts wanted. K8JOF, 2448 N. Wilson. Royal Oak, Mi. 48073

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CHICAGO AREA OPERATORS, EXPERT REPAIR work performed at reasonable prices. Cleaning and lubrication; printers $11.00, Keyboards $6.00, Reperfs, $8.00, Repair work, any model teletype apparatus, $17.00 plus parts. Phone (312) 392-2358. Contact Neil.

FOR SALE: BEST OFFER! Model 28KSR, Model 19 w/reperf, Model 15. Reason for selling, upgraded to 28ASR. Vacum variables-300 pfd and 700pfd. $25.00 prepaid. W7GRS, Box 381, Marsville, WA. 98270.

UT-2/UT-4 COMPONENTS. FIFO/UART/7422IN/NE555V. Fairchild 33512PC FIFO $13.00, 2/$25. Choice of TMS-6011NC plastic or GI 5-AY-1013 ceramic UART, $11.00. 7422IN $1.25, NE-555V $1.00. Kits of associated semi-conductors: UT2 - Three TTL IC's diodes, op-amp, NPN, $2.00; without 741 op-amp, $1.50. UT2/4 add-on conversion, Eight TTL IC's $7.00. Both kits, $8.50. Set of seven one-percent precision mini-size resistors for simple D/A converter, $1.75. Motorola D/A chip only on special order, $6.50. No plans for PCB's. Everything postpaid and prime material from franchised distributors; no surplus. Overseas airmail add 50¢. Peter Bertelli, W6KS, 5262 Yost Place, San Diego, CA. 92109. 714-274-7060.

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Modifications for Weather

CONTINUED FROM PAGE 16

and one-half inches long and approximately three-eighths inch wide.

This addition will now extend out past the front of the typing carriage.

The metal in this cut-out lever, I found to be extremely hard metal to drill for a bolt, so I ended up with soldering, which has given no trouble.

Before putting the carriage back on the base, you must now remove the multi-contact switch, which is directly behind the little drop door on the machine case cover. There were nine various colored wires on my machine. Tape the ends of each and tuck back out of the way.

Place type carriage on base-put cover on machine and your back in business.

Opening the little door, now exposes your new extended switch and with the switch pushed to the left, you will print the usual ham stuff and pushed to the right, your weather information will appear without becoming an unintelligible jumbled mess. ***

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