"RON" VK5RY

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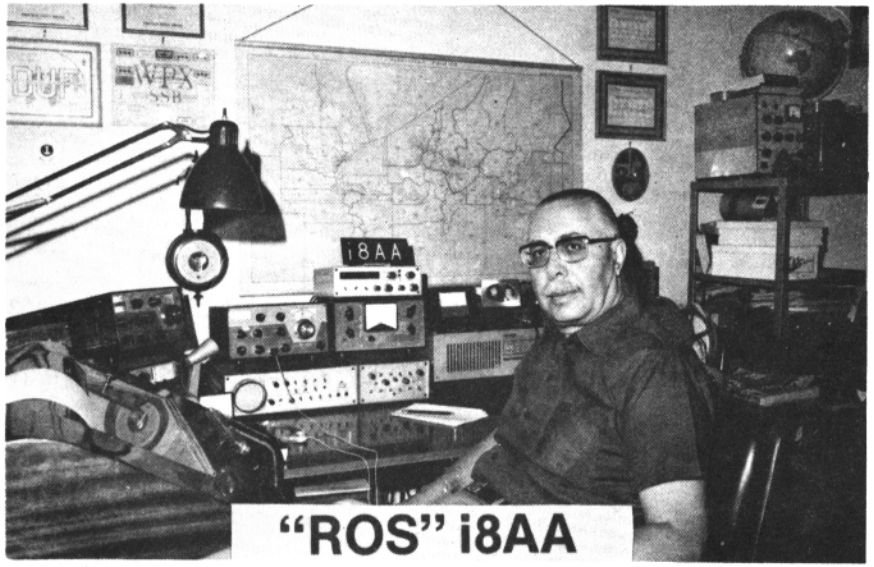

"ROS" i8AA

"Ros" is steady leader in DX contests and recent winner of DXCC.

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RESULTS — 1976
BARTG DX Contest.

SINGLE OPERATOR STATIONS

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3	K4GMH	192520
4	I5WT	177054
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6	PY2CYK	166680
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8	WA3JTC/ZP5	149400
9	W4CQX	133480
10	HB9AVK	131152
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SHORT WAVE LISTENER

1. H.Ballenberger DL-SWL 133632
2. Roberto Giarnello 13 13018 116480
3. Cech Lubos OK2 5350 105258
4. Paul Menadier USA 80276
5. Alberto Marchesini 14 14707 70928
6. Alfonso Zarone 18 58587 30544
7. Alberto Casuala 18 57963 29578
8. T. Musson BRS 27262 23688
9. Hajime Suzuki JA1 3477 20064
10. John Reins NL 4577 13872

MULTIPLE OPERATOR

NO.	CALL SIGN	POINTS
1	W1MX	156240
2	SM6FUG	140302
3	DL8VX	127296
4	OK1KSL	71526
5	G4ALE	60392
6	LZ1KDP	54000
7	TF3IRA	37250
8	OK1KVK	7320

*****

Using two Standard 28 LXDs on the ASR Double Transmitter Base.

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In recent years there have been many Model 28 ASR sets made available to hams that have been equipped with the double transmitter bases. These machines have come from various government services and from Western Union through the MARS program and via the surplus market. Most hams, when they modified these machines for RTTY use, found it necessary to replace the double base with the single transmitter type. Some purchased the single base and others actually cut off the double base so that it would accommodate only one transmitter.

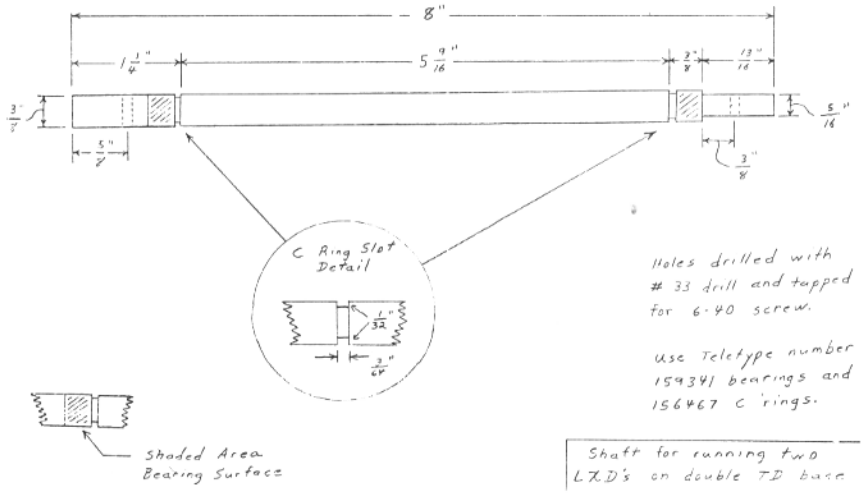
The LXD transmitter has serial output and is the most common type of TD used in the Model 28 series of Teletype equipment. All RTTY transmission is serial (series transmission - one bit at a time). If you use Model 28 equipment, this serial data would come from either your keyboard or an LXD unit. In many cases it would be handy to have the use of two transmitters in the shack. A net control station could use several short tapes during one transmission with no time delay in changing the tapes. Two transmitters could be used for editing while making a single long tape. A second transmitter could be used for off-line copy or tape preparation while the first TD is operating on the air.

Once you have the use of the second TD on an ASR set, you will wonder how you got along without it.

The double transmitter base as it comes from Teletype Corporation will not operate two standard LXD transmitters. It was designed to operate one LX (parallel output) and one LXD (serial output). To use two LXD's the base must be modified to correct the shaft speed and the direction of rotation. Modification is quite simple and involves little or no expense. The speed problem is corrected by changing the right angle drive gears at the rear of the base. The direction of rotation problem is corrected by the fabrication of a new shaft and the addition of one new gear and the elimination of two original gears. Connector rewiring will also be required for the second LXD connector.

Step by step instructions for this modification are as follows: Part number reference comes from Section 573-128-800 pages 8 and 9 of the Model 28 ASR parts manual.

1. Remove base and transmitters from the ASR cabinet.
2. Remove both transmitters from the base.
3. Remove and discard the right angle drive gear and pinion.
4. Remove the long right angle drive shaft 170294 from base.
5. Strip all hardware from the shaft; discard the shaft and the front gear. Retain

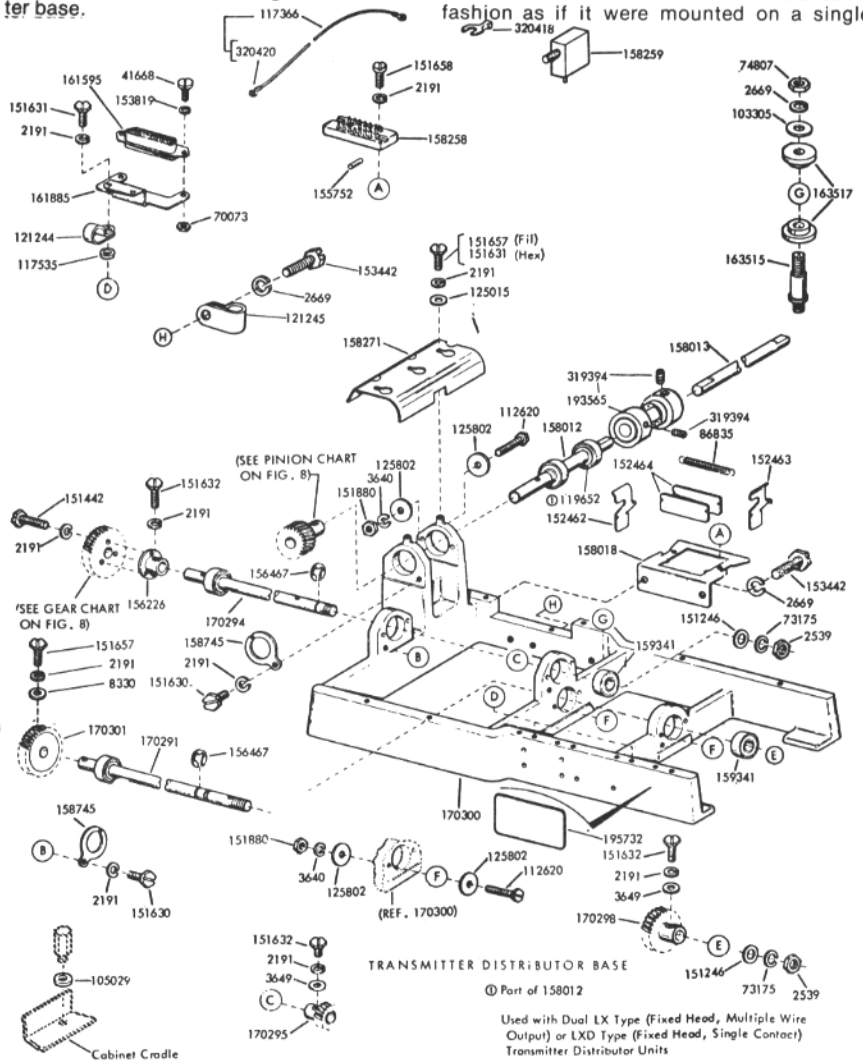


rear gear mounting plate 156226, bearings, and C rings as these will be used on the new shaft.

6. Remove and discard 170301 gear from the front transmitter drive shaft. 170301 gear is mounted on the rear end of the shaft behind bearing bracket. Leave this shaft and the remaining gears in place.
7. Fabricate new shaft according to specifications on drawing.
8. Reassemble new shaft with the same hardware and mount in the same position as the original shaft.
9. Attach 163003 gear on the small end of the new shaft. This is the same gear that is used on the standard single transmitter base.
10. Using gear and pinion chart for the single transmitter base, select gear and pinion for the speed you desire.
11. Rewire the old LX connector so that it matches the wiring for the LXD connector. Rewiring will also be required on the base side connector and on the ASR cabinet terminal blocks.
12. Mount the base in the ASR cabinet.
13. Mount the LXD's on the base and check for proper gear mesh with each. Check with manual rotation for proper operation before power is applied.

The principle of operation of the modified base is quite simple. The new shaft and gear will drive the rear mounted TD in the same fashion as if it were mounted on a single transmitter base. The original drive shaft, under the two transmitters, is driven by the mainshaft gear of the rear LXD; this shaft then drives the front mounted transmitter.

A five page copy of this modification specification with full size shaft drawing and the necessary pages from the ASR parts manual is available from the author. He will also be glad to assist if problems are encountered.



IMPROVING The ST-6 AUTOSTART

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In the six years since its introduction, the ST-6 demodulator still remains one of the top T.U.'s available to the amateur. One of the nicest features in the ST-6 is the smooth, reliable autostart system developed for this unit. However,one aspect of the motor control feature of the autostart system has always been somewhat of a problem for this author.

In the presence of a steady mark tone, the autostart remains in the receive position and the printer motor is kept running. While the steady mark condition is seldom encountered in amateur use, it is found quite frequently in the commercial bands. Often quite a period of time elapses between text transmissions and it became evident that a way to revert back to stand by with motor off while preserving the previously mentioned features of the ST-6 system would be desirable.

The easiest method found was to use a machine equipped with a mechanical or electrical time delayed motor off. Having several MITE teleprinters so equipped, this author found the combination of the ST-6 autostart and timed motor off a versatile combination. Upon using a model 28 without the timed motor off feature however, the combination was quickly missed. While there is a Teletype Corp. accessory incorporating a set of ratchets to mechanically tick away a preset time interval before shutting off the motor,a cheaper and easier to install way was found.

Figure 1 shows the circuit used by this station. It is built up on a small p.c. board and mounted directly onto the rear of the Autostart/Anti-space board of the HAL series ST-6. The board was secured by placing it perpendicular to the HAL board and soldering the ground busses of the two boards together. Only three connections are made to the Hal board,no foil need be cut and no components are removed. The circuit centers around the very handy 555 I.C. timer. Pin 3,the output,goes to the input of OA-5 in the ST-6. During reception of FSK, pin 3 is high and, being blocked by D1, has no effect on the input of OA-5. Q1 via Q7 in the ST-6 is used to detect the presence of a valid FSK signal and triggers the 555 to turn on via D2 and pin 2. Once triggered the I.C. timer begins to charge C1 through R1. However, as long as FSK is being received C1 is prevented from charging by D3 and the switching action of Q1. Now, if the station being printed stops transmitting and reverts to the steady mark condition, C1 begins to charge fully. After charging to about 63% of the supply voltage, C1 causes the I.C. to drop its output, pin 3, to low. This pulls the input of OA-5 in the St-6 low and effectively mimics a loss of signal condition. The ST-6 autostart now takes over and functions as usual to shut the motor remains off until valid RTTY is again received and the ST-6 turns on again in its normal manner.

Note that with the addition of this circuit nothing about the manner of operation of the ST-6 has been changed. In the event of a loss of signal, the conventional autostart circuit functions as before. This circuit only comes into play in the presence of a steady mark condition. A time delay of about 15 seconds has been found to be about right. Fig. 1 explains how to determine the length of time delay. One added benefit of the circuit is that the ST-6 autostart system is placed in standby and will not turn on the motor until valid RTTY is confirmed so that unlike the mechanical motor off systems which operated with the ST-6 in receive and were forever cycling on and off in noisy conditions,this system will remain quiet until something worth printing is available.

No ST-6 owner who does a lot of RTTY printing can afford to be without this inexpensive,simple to build and install circuit

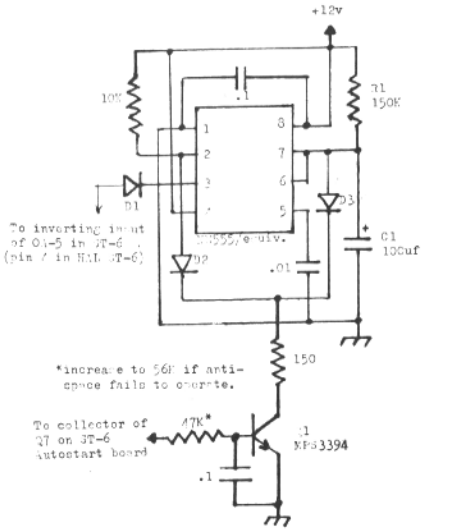

FIGURE 1- Time delay= 1.1 xR1 (ohms) x C1 (farads) in seconds.

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Laymans Guide to trouble shoot the UT-4

No. 1 in a series of Articles.

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Like all things, the UT-4 must have a brain, something to tell everything what to do. In the UT-4, this consists of various timing parts. In illustration number six, let's first take a closer look at Pins 18 and 19 of the UART. Pin 18 may be considered as the receive section strobing point although it is not technically correct. Don't get shook up or disturbed by the word strobe, nor confuse it with a clock. To explain it simply, a clock is an oscillator, and a strobe is a pulse that initiates a sequence of timed events.

Pin 19 of the UART is more or less a flag. This pin normally sits low and stays there until a character has been entered into the UART. At which time it goes high and signifies that a character has been received. Once this pin has gone high, the UART will not accept any further characters until it has been reset. Pin 18 is the reset for this and when pin 18 is strobed low, it resets the UART and pin 19 to now accept another character. Once reset, pin 19 goes low again until the next character has been received and once again goes high until it's reset again.

Since pin 19 goes high and at that time pin 18 needs a low to reset 19, we could have the UART reset itself by simply installing an inverter with the input of the inverter going to pin 19 and the output going to pin 18. With this type of configuration every time that pin 19 went high, the output of the inverter would go low which would reset the UART since this low went to pin 18. This type of circuit is indeed used in the UT-2, but a little more is required in the UT-4.

You will notice that in the UT-4, pin 19 goes to the input of one half of IC-II. IC-II is what is called a "multivibrator". A multivibrator is really nothing more than a pulse producing oscillator and this particular one is called a "one shot" for the simple reason that it will produce only one pulse at a time. Every time that pin 10 goes from low to high, it will produce a pulse on its' outputs.

The pulse duration will be determined by the timing components converted at pins 7 and 6, and in this particular case, the timing will be somewhere in the area of 3 microseconds in duration. So again this output pulse will be difficult to see. Once the multivibrator has been triggered, its output is independent of any further transition of the input and are now a function of the timing components.

The 74221 (IC-II) has **two** such independent multivibrators inside one package and so at the moment, we are only concerning ourselves with one half of the chip. The outputs of this one half are pins 12 and 5. These outputs ae called "Q" which is pin 5, and "Q" which is pin 12. The "Q" symbol means "not Q", and usually can be thought of being the opposite of whatever Q is, or in other terms, whatever the Q output is, the other output is "not" the same as "Q". For example, if Q were high, then "Q" (not Q) would be low.

So getting back to IC-II, or one half of it at least, pin 12 ("Q") is normally high, and for the moment, this is the only output we will concern ourselves with. Every time that pin 19 of the UART goes high with a new character, it triggers our one shot. Once triggered, pin 12 output is pulsed from high to low for 3 microseconds, returning to high again. This pulse, combined with another timing pulse we will cover shortly, is inverted by IC-4C, so it now becomes a low to high pulse. This low to high to low is inverted, once again, to a high to low to high by IC-4B and this is fed to pin 18. This high to low pulse is all that the UART needs to reset pin 19 and the UART so it is ready to accept another character. Isn't that neat? The UART more or less resets itself. So again, in summary, so you are sure you understand it, when a character is received, pin 19 of the UART goes high which triggers one half of IC-II. The output pulse is inverted by 4C, inverted again by 4B, and is fed to pin 18 of the UART, resetting the UART and pin 19 for reception of the next character.

We talked earlier of another timing pulse that is fed to IC-4C, but it is not really a timing pulse as such, but let's look at it some. Pin 12 of 4C is fed from pin 16 of the first FIFO, and this pin is normally high. When a character has been received by the first FIFO, this pin goes low and then returns to high again. This feature is nice as it allows you to see if the FIFO is accepting characters. However, this is not the primary purpose of this pin. Actually, this pin is the flag that indicates the FIFOS are full and can no longer accept any characters. When the FIFOS do get full, this high to low pulsing stops, and the pin goes low. It will remain there until the FIFOS can hold another character.

Since this pin (16) is fed to IC-4C, it provides a method of keeping the UART from sending characters that the FIFOS cannot handle. When pin 16 goes low, it prevents the UART reset pulses from reaching the UART, and so the UART will stop accepting characters. Once a character has been outputed, this pin returns to high and the UART will again be permitted to receive its reset pulses.

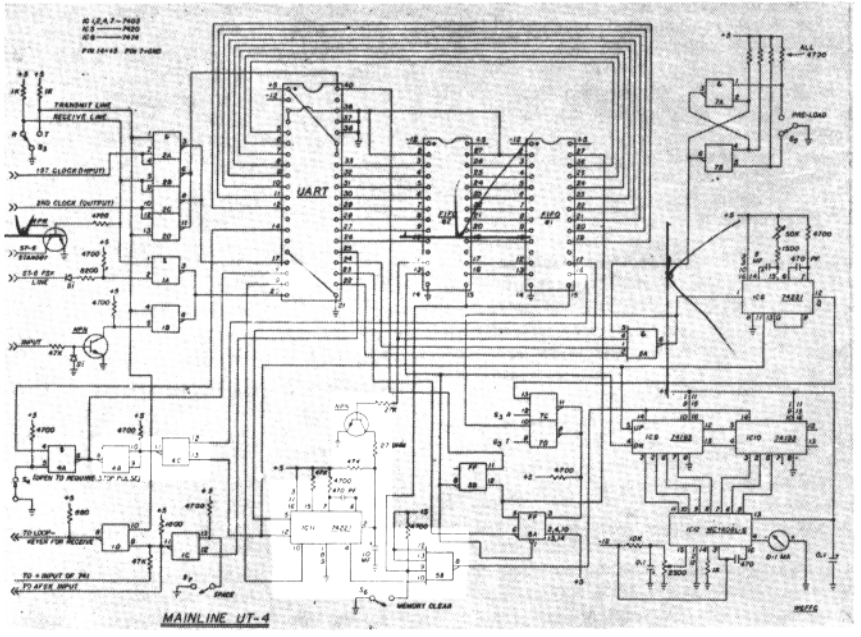
There is one more timing circuit I would like to cover here before proceeding and this one is a rather easy one. It involves the other half of IC-II and the transistor shown directly above it.

The base of this transistor goes to pin 12 of the second FIFO. We can ignore the 27K resistor as this just serves as a current limiter. Pin 12 is another pin that is used as a flag, but this one is just the opposite of the previous one. This pin is the flag that says the two FIFOS are completely empty. When the FIFOS are empty, this pin is low. When a character is fed into FIFO this pin goes high. It will stay high and will pulse low each time a character is outputed from the FIFO. So here again we have a nice pin to check to see if the FIFO is outputing. Once again when the FIFOS are empty, the high to low pulsing stops and stays low.

As long as this pin is high and pulsing, it causes the transistor to conduct and pulse also. The collector is tied to pin 2 of IC-II which is the trigger input. This multivibrator (½ of IC-II) is set up so that the voltage on pin 2 must reach a certain level before the trigger (pulse) will occur. You will notice on pin 2 of IC-II that there are three components: a 10mfd capacitor, a 47K to plus five volts, and a 27 ohm resistor in series with the collector of the transistor. As long as pin 12 is high indicating that there's something in the FIFO, this transistor will conduct something in the FIFO. This transistor will conduct and the 10mfo will stay discharged. As pin 12 pulses from high to low to high again, it will cause the transistor to be cut off during the low. The cap will try to charge via the 47K but this low is so brief that it doesn't have enough time to charge very much, and is discharged when pin 12 goes high and the transistor conducts again.

But, when the FIFOS become empty, pin 12 goes low staying there, cutting off the transistor. The cap again starts to charge and this time is allowed to do so. When the voltage at pin 2 reaches a certain level, it triggers the one-shot into producing a pulse. This pulse is extremely fast and short in duration and appears on the Q output line, pin 4, as a low to high to low pulse. The pulse is inverted to a high to low to high pulse by IC-5B previously discussed, and is used to reset the FIFO status character counters back to zero.

So now we have a very effective method of making the empty FIFOS reset the character counters and this will help ensure that the counter will start tracking correctly every time the FIFOS are empty.



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RTTY theory & applications-

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RTTY SIGNAL BANDWIDTH
Part 3 - FOURIER SERIES

In the first two parts of this series we established certain requirements for AC circuit calculations and some of the terminology and principles necessary for analysis of circuits containing non-sinusoidal signals. This month we are going to discuss the Fourier Series. (It is not necessary to fully understand what we are going to do in this installment - it is given for sake of completeness.)

The basic idea behind Fourier analysis is that any periodic signal can be "decomposed" into a series of harmonically-related pure sinusoids, and possibly a DC voltage. How to use the resulting series will be discussed next month.

Assume that a signal being applied to a circuit can be expressed analytically; i.e., it is possible to write a mathematical formula that expresses the voltage as a function of time. Call this function, v(t). If v(t) is periodic, it can ultimately be expressed in the form:

$v(t) = a0 + a1\cos(wt) + a2\cos(2wt) + a3\cos(3wt) + a4\cos(4wt) + \ldots + b1\sin(wt) + b2\sin(2wt) + b3\sin(3wt) + b4\sin(4wt) + \ldots$, where, $w = 2\pi/T$, and T = the period of repetition or the time to complete on cycle.

The coefficients, a0, an, and bn, can be determined as follows:

$$a0 = 1/2\pi \int_0^{2\pi} v(O)dO,$$

$$an = 1/\pi \int_0^{2\pi} v(O)\cos(nO)dO, \text{ and}$$

$$bn = 1/\pi \int_0^{2\pi} v(o)\sin(nO)dO.$$

The limits on the integrals are somewhat arbitrary, but, usually, are chosen in a manner that will give the simplest answers.

To illustrate the process, assume that it is desired to find the Fourier Series for the square wave of voltage shown in Fig. 1; this is a typical voltage wave that might be found in a non-inductive telegraph loop when "dots" are being sent from a test set such as the I-193-C. The loop is a 130-volt loop; the dots are at 45.45 Baud ("60-speed").

By inspection, it can be seen that the voltage or function repeats itself every 44 milliseconds; therefore, T = 44 ms, and the angular velocity, or "angular frequency", w = 142.7 radians/second.

Because the formulas given above are in terms of angles rather than time, it is necessary to convert the time scale of the voltage wave to an angle scale. This was done, as indicated on the lower horizontal scale in Fig. 1, in terms of radians. (We could have used degrees, but since degrees are meaningless units. we have used the mathematically-meaningful radians.) Because of certain peculiarities of Fourier Series, we can set the zero-angle point more-or-less at will; however, judicious placement of the zero radian point will result in a simpler answer. Therefore, we have chosen zero radians to correspond with zero time, pi radians (½ revolution or ½ cycle) to correspond with 22 ms, and 2pi radians (one cycle) to correspond with 44 ms.

We now have to obtain an analytic expression for v(t) or v(O). By inspection, it can be seen that v(O) = 130 over the interval O to 22 ms or O to pi radians; v(O) = O over the interval pi to 2pi radians or 22 to 44 milliseconds.

To obtain the aO coefficient, integrate by parts as follows:

$$aO = \tfrac{1}{2}\pi \int_0^{\pi} 130dO + \tfrac{1}{2}\pi \int_{\pi}^{2\pi} OdO;$$

therefore, aO = ½pi x 130 pi = 65 volts. It should be noted that aO is simply the average or DC value of the voltage wave given in Fig. 1.

To obtain a1, set n = 1, plug in v(O), and:

$$a1 = 1/\pi \int_0^{\pi} 130\cos O dO + 1/\pi \int_{\pi}^{2\pi} O\cos O dO.$$

Since the second integral equals zero (this was part of the judicious selection of the zero angle point), only the first integral has to be evaluated.

$$a1 = 1/\pi(130\sin O)\int_0^{\pi} = O\ !!!$$

This is a bit disappointing; all that work for zero! However, actually it is good, and, again, results from the proper selection of the zero angle point. When all other a_n are evaluated, it will be found that they are all zero.

The b_n terms are evaluated in much the same manner as were the a_n terms. The terms are found to be: b1 = 260/pi, b2 = ?, b3 = 260/3pi, b4 = Q, b5 = 260/5pi, b6 = O, b7 = 260/7pi, etc. The series is, therefore, a DC term equal to ½ the maximum value of the voltage wave, and a series of sine waves which include the fundamental and all odd harmonics. The odd harmonics decrease as the order of the harmonic; i.e., the third harmonic is ⅓ as large as the fundamental, the fifth harmonic is 1/5 as large as the fundamental, etc.

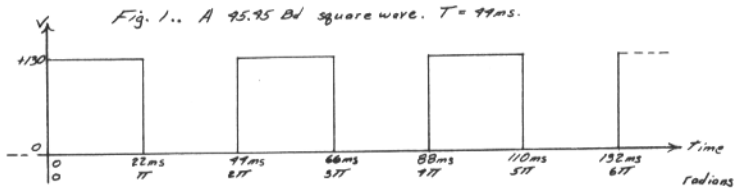

Fig. 1.. A 45.45 Bd square wave. T = 44ms.

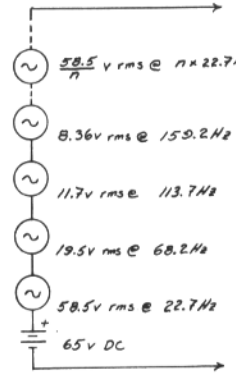

Fig. 2.. A group of generators that will produce a 130V, 45.45 Bd square wave as shown in Fig. 1.

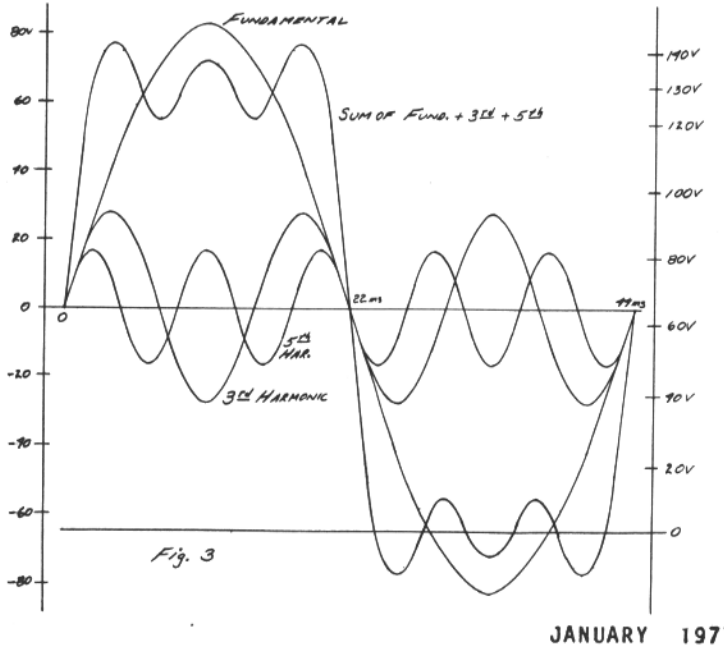

Fig. 3

The actual series is: v(t) = 65 + 83sin143t + 28sin428t + 17sin714t + 12sin1000t + 9sin1285t + ... The coefficients of the sine terms are peak values; because all the terms (except the first) are sinusoids, they can be converted to rms values by dividing by 1.414. The coefficients of t are "angular frequency" in radians per second; they can be converted to the frequency in Hz by dividing by 2pi.

Therefore, the series can be expressed as: v(t) = 65V DC + 58.5V rms at 22.7 Hz + 19.5V rms at 68.2 Hz + 11.7V rms at 113.7 Hz + 8.36V rms at 159.2 Hz + ..., all at zero relative phase. Another way to look at the results is that the sum of all these terms is a square wave of 130V amplitude and a period of 44 milliseconds! Just what we started with.

A graphic description of this result is shown in Fig. 2. If a group of audio oscillators were connected in series along with a DC power supply and the oscillator outputs were adjusted to the frequencies and voltages shown, the voltage appearing at the arrows would be that shown in Fig. 1. Don't collect a bunch of audio oscillators from friends and try this unless you can obtain good oscillators that are capable of being phase-locked because the oscillators must have the phase angles exactly right or the output will not be a square wave.

In Fig. 3 we have shown, graphically, that the sum is a square wave, or, at least, looks like it might approach a square wave. The fundamental, 3rd harmonic, and the 5th harmonics are drawn using the voltage scale on the left and the horizontal axis in the middle of the sheet. The curves are drawn as they would appear on an oscilloscope if each were obtained separately and then superimposed. The sum of the three can be obtained by adding all three curves (including sign) at various points along the time scale. We added them at 33 points.

The curve that forms the sum is indicated. Although it does not appear to closely resemble a square wave, it does have characteristics that are similar to one. If the seventh harmonic is added, the "ripples" will be partially filled in and the corners will "square-up". As more of the higher frequency harmonics are added, the result will more closely resemble that of a square wave. The interested reader should try adding at least the seventh harmonic to notice the effect it has upon the overall wave shape. (We have some large copies of this figure that we will be happy to supply upon request.)

The DC (aO) term can be added, simply, by shifting the horizontal axis downward by 65V. This has been done in Fig. 3 as indicated by the horizontal axis near the bottom of the figure; the voltage scale on the right is for use with this axis.

There are a large number of non-RTTY applications for Fourier Series. They encompass such things as clicks on CW signals, audio amplifier testing, and the difference in sound between such electronic musical instruments as the Allen and Hammond organs. The RTTY applications will be left for next month.

Next month we will begin to apply our results to RTTY.

Because of the length of this installment, we have not included any VHF RTTY News. We will have some for you next month.

73, ES CUL, RG.

The Case of the DISAPPEARING TD.

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403 Centerview Ave.
NEW CUMBERLAND, PA. 17070

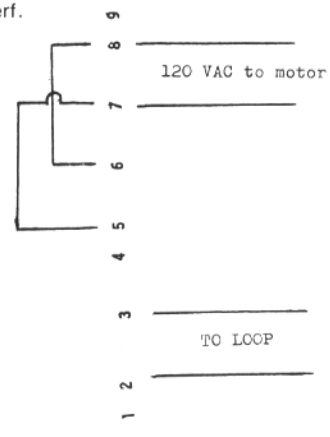
A few years ago I was fortunate enough to acquire a Model 28 KSR. This replaced my old faithful Model 19. I was not so fortunate with the tape gear. I was forced to continue using the Model 14 Reperf and TD. The loss of the Model 19 presented a problem. Where and how do I mount the TD? I thought about this for a while and realized the answer was in the shack all the time. I had the 14 reperf sitting on a Model 15 table.

You will notice on careful examination that there is a shelf in the 15 table. Mount a 20" x 12" x ¾" piece of pine or other wood to the shelf with four 10-32 flat head screws counter-sunk into the wood.

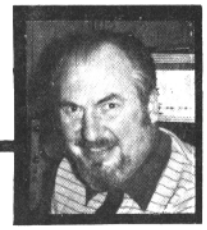
Remove the 14 TD mounting plate from the 19 table and re-mount it on the wood with four flat head wood screws.

The TD should be wired as shown. The motor on/off switch can be mounted on a simple sheet metal bracket or mini-box on the front of the shelf.

This simple modification can get the TD out of the way while keeping it close to the reperf.



RTTY-DX



John Possehl, W3KV, Editor
P.O. Box 73, Blue Bell, PA.19422

Hello there . . .

Our participation in the WAE RTTY Contest unfortunately was quite limited, so an "eye witness" account will be quite brief. Many of those who did contact indicated that band conditions were quite poor and in general we would agree. There were times on 15 meters when signals from Europe were S-9 but there seemed to be very little activity to take advantage of these brief openings. Much of the short skip activity did take place on 40 and 80 meters as there were bonus points for contacts on those bands. The operation by DJ4KW/4X caused pile-ups on all bands and his activity from Israel continued well into the week following the contest.

We did notice a good deal of chatter between stations about the interpretation of the Rules. To encourage more RTTY activity the Committee made some changes from the standard format as applied to the CW/SSB WAE Contest. Perhaps we can clarify some of the questions raised and also come up with a question of our own. Rule No. 9 says that QTC's can only be sent from a Non-European to a European station (which is always valid for the CW/SSB sections of the WAE Contest). Rule No. 13 amends this and says that for the RTTY Contest, exchange of QTC's ARE permitted between all countries except your OWN, i.e., a VE can exchange QTC's with a W etc. So far it all seems pretty clear. Now then, for Contest purposes, each call district in the several countries listed counts as a separate multiplier. This, in effect, makes them "pseudo-countries" for contest purposes and it would be logical then to assume, for example, that a W3 could exchange QTC's with a W6 or a W4 but not with a W3 (ones own "country"). So this is the ? that perhaps will be clarified by the next Contest period. Also, the 15 days allowed for sending in the logs may be a bit too brief, especially for those in remote areas that may send them by surface mail. Surface mail between continents now averages four weeks or more.

Activity from Monaco by 3A2FB has been most welcome and promises to be more sustained than the earlier brief flurries of RTTY activity from there. Ray puts out a real nice signal once the machine gets on speed. It seems that his machine has to run a while before it warms up and gets in sync. QSL's can go direct to --

Raymond de Vos
Chateau Perigord
Monaco

For you 80 meter DX'ers, PJ3AR and HR2AFK have been showing up at around 3620 khz at 2300z from time to time. Fred,

HONOR ROLL

DXCC CONFIRMED

ON4BX	155	W5EUN	131	W1GKJ	108
ON4CK	153	W2LFL	130	K6WZ	106
W3KV	152	G6JF	123	DL8VX	104
DK3CU	142	W8CQ	121	I8AA	102
WA3IKK	137	I1KG	120	W8JIN	101
W5QCH	136	I5WT	120	W4EGY	101
JA1ACB	135	I5ROL	114	W4YG	100
W3DJZ	133	W4CQI	109	K8YEK	100
				W3EKT	100

OVER 50 Confirmed

DJ8BT	95/88	K4VDM	72/68
OK1MP	90/87	SMØOY	70/68
K3SWZ	99/86	SM6AEN	70/67
F5JA	93/83	K4YZV	76/66
I6NO	105/80	K7BV	78/64
OZ4FF	88/77	SM7CLZ	65/61
KH6AG	88/76	WØMT	64/61
HB9AVK	92/74	WA3JCT/ZP5 -	70/60
F6ALL	90/73	JH1ISF	65/60
CE3EX	86/73	WØNP	63/58
OH2HN	77/70	W9RY	91/56
G8LT	73/69	WØHAH	68/56
ON5WG	85/68	HB9AKA	62/51
	W9CAT 54/50		

Less than 50 Confirmed.

HB9ACQ	61/48	PAØWDW	54/30
WA9WJE	57/46	SM6EZD	35/30
JA1DI	60/43	DK4ZF	61/29
HB9HK	56/42	DLØAK	49/28
UA9PP	67/40	WB4MAV	52/27
WAØTAS	54/41	K4GKW	53/25
WAØYDJ/4	59/40	W4ZCM	41/25
PY2CYK	45/39	K4JAF	36/24
VK6PG	53/38	PY6HL	33/23
ON4CZ	65/36	DK1NB	67/22
WA4TPU	56/35	W4ZLH	35/22
G3LDI	56/33	K7MJC	28/20
K1LPS	38/32	VE2QO	41/19
W1MX	46/31	WØLZT	33/41

*****

HR2AFK, now has the AFSK on 170 hz shift which should make for easier copy in the QRM.

Roland, FR7AB, had been quite active again during the latter part of November and let's hope that it continues. His signal is really strong Stateside when the band is open to that area. Brush up on your French as that is the only language Roland uses during the QSO.

Roland Natival
9 Champs Fleuri
St. Denis, Reunion Island
Indian Ocean

Some testing with RY's and QBF's was recently observed on 14 mhz by OD5ES. Signals were very strong with a shift of 850 hz and speed of 45 baud. Perhaps as the situation gradually improves over there we will soon again have RTTY activity from Lebanon.

We have received word that after the brief showing by Alex, 5Z4TV a few months back the machine he was using went bust which accounts for his present QRT. He still has an intense interest in the mode and is presently looking around for a suitable replacement to get back on the air. His complete QTH is. . .

Alex Quarmyne
P.O. Box 30592
Nairobi, Kenya

Alex was formerly 9G1TV in Accra.

The most recent issue of "HR Report" at this writing included an item of interest to RTTY'ers. A9XBD, on Bahrain, in the Persian Gulf is now QRV and transmitting with 170 hz shift. This the only station presently active from this area so watch for him. Perhaps the licensing for RTTY has changed now and Sid, A4XGB, on Oman may get going again also. Sid was back in Lincoln in early November for a few days and had hopes of getting the ban lifted upon his return, but have had no further word to date.

Contact was recently made with John, 9H1ET. He is presently using 50 baud and his activity would boost to three the activity from this small island. John is located at Msida, Malta.

From Hop, W3DJZ, we have some very interesting news to report. Most of you are aware of the excellent DXpedition to Palm Island, in the St. Vincent Group, made by Bob, WB8JEY/VP2S, early this year. Well, Bob will be making a repeat visit to the same place from 14 January to 15 March of 1977. This time he has high hopes of setting up his gear on some of the neighboring islands. Grenada, VP2G, in particular, is only five miles from Palm Island and can be easily seen. Of course, there is a political difference so licensing must be separately arranged. With the cooperation of John, VP2SV, a native of the area, Bob has hopes of obtaining the necessary license. It is quite possible that other islands will also be visited. In addition, Bob plans to leave the RTTY gear on Palm Island when he leaves. VP2SV was using Bob's gear on the previous visit and enjoyed the mode very much. This would then make a permanent station active from that area. So it looks like there are some interesting possibilities already in the works for early in the New Year.

In 1976 the following stations reached the highest plateau in RTTY-DX, DXCC, W1GKJ, W4CQI, DL8VX, K6WZ, W3EKT, W8JIN, and W4EGY. As the year fast draws to a close we welcome still another member to this quite exclusive club. It is a pleasure to award. . .

PLAQUE NO. 25 for 100 RTTY DXCC
TO
Dr. Rosario Pentimalli I8AA

It is quite difficult to participate in a RTTY contest and not contact Ros. Not only is his signal one of the strongest coming from Europe but his endurance is such that in the final minute of the contest he sounds just as fresh as at the opening bell. Ros was first licensed in 1961 and directed his energies to DXing on phone right at the start. DXCC in 1963. 5 Band DXCC No. 105 in 1971. DXCC Honor Roll in 1972 (314/325). CQ DX SSB and WPX SSB Honor Roll in 1972. Founding Member and Vice-President of DXOTC. IARTG/ARI Awards and DX Manager. RTTY activity commenced in July of 1974 and he enjoys this mode far better than SSB. His 100th country was worked (VU2KV) on May 26, 1976. Present total is 107 worked and 102 confirmed. Equipment consists of the Drake Line for receiver and exciter, homebrew linear amplifier, ST-6, UT-4, Hal DKB 2010, Technoten DVC 32 Video Display, several Ollivetti machines and one old TG7. Antennas are a Hy-Gain tri band Quad and a 14 AVQ plus inverted vee's for the lower bands. Congratulations Ros.

W A C ALL 14 MHZ

Nr. 31	Kozi Takashina	JA7 ML
Nr. 32	John Coulman	G3HJC

We congratulate the above amateurs for their excellence in RTTY-DX.

The Volta RTTY Contest had usually happened the first weekend of December for a great many years but this year we failed to receive any announcement of the event and also failed to find it listed on the contest calendar of the leading amateur magazines. So right now we know about as much as you do, but will attempt to get further details.

At the close of 1976 we extend Seasons Greetings to all readers of the column and above all my sincere appreciation to all the contributors who are the ones who have really made these writings possible.

73 de John

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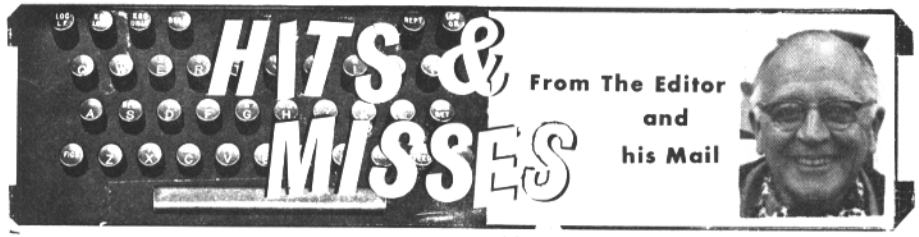

This issue starts our 11th year of publishing the JOURNAL. A decade is not too long a time, but the older you get, the faster it goes. We again want to thank our authors and subscribers who have supported us so generously. However, our very special thanks to John, W3KV and Ron, W8BBB who have been with us for every issue. Writing a column every month takes devotion as well as time and we would have been lost without them.

JOHN, RON and the writers wish everyone a Most Prosperous and Happy New Year.

***

Once or twice a month we get a puzzle back from the post office. It consists of a JOURNAL marked "no such number" or "undeliverable at this address". People move - and we goof once in a while on new subscriptions, but the puzzle is with those that have been delivered for several years with the same stencil and suddenly are returned as undeliverable. If your magazine suddenly stops write us and be sure to give the complete address. Although first class mail should get some attention over junk mail some offices seem to find it easier to return than deliver to the addressee.

***

In case you were wondering what happened to weather station WSY7O, Wm. Manke of Madison, Wisc. informs us that an inquiry to the National Weather service states: This service was discontinued because there no longer exists an international requirement for its continued operation. There is no possibility of its return to operation. Guess the weather buffs will have to get a 100WPM machine

***

Dayton is creeping up. April 29-30 and May 1st. All local motels are a sell-out long before the hamvention so make your reservations early. The JOURNAL hospitality room is at the Imperial House North, I75 and Needmore Rd., Dayton, Ohio. Phone (513) 278-5711.

***

Classified ads are read by a great number of our subscribers and this is fine. However, a great number of our subscribers are also inserting ads and this is creating a space problem. This month if the ads continue, will run a 20 page issue to bring the editorial content back to the usual amount.

***

BACK ISSUES

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Programmer For the Signetics 8223 Programmable Memories

In the October issue, courtesy of the CARTG RTTY NEWS and the author, we published a Serial Baudot to ASCHII - ASCHII to Baudot converter for 8 level machines. The following article describes a programming box for the 8223 as well as one program each for the four PROMS used in the code converter. Also courtesy of the RTTY NEWS and the author.

ERIC KIRCHNER, VE3CTP
Ontario Science Center
770 Don Mills Rd.
DON MILLS, Ont. CANADA

In connection with the Baudot to ASCII converters (and vice versa), some sort of memory is needed which remembers what ASCII character corresponds to a certain Baudot character. The input (address) of the memory is presented with the equivalent of a certain Baudot character and the output of the memory presents the corresponding ASCII character. Such a memory should retain this information even if the power supply is shut off.

So-called programmable memories, Prom for short, are employed for this purpose. There are presently three types of Prom available:

A) Straight Proms:
These are arranged in form of a matrix. In the case of the 8223, the matrix is a cross pattern of 8x32 cells. These cells are all intact and programming is accomplished by burning out some of the cells according to the desired memory pattern.

B) Erasable Prom. or Eprom:
These are similarly programmed, but the cells are not burned out but instead are charged by an electric pulse. The charge is stored indefinitely in the cells. The programmed pattern, however, can be erased by aiming an ultra violet light source at the quarts lid covering the matrix array.

C) Electrically erasable Prom, or EEProm:
Programming is similar to B) but the erasure is accomplished by applying a certain voltage to one of the pins of the chip.

Ideal of course is the EEPROM. However, prices for only one chip are high (45 dollars), and the programming procedure is rather critical. The same is true for the Eprom. Thus the 8223 remains as an economical choice. These are presently available for $2.95 from Polypaks. The main disadvantage is the danger of faulty programming. If only one of the 256 cells (8x32) is accidentally burned out at the wrong location the Prom becomes useless. Burned-out cells cannot be restored again.

The programmer shown in the circuit makes the programming procedure a cinch as the burn-out time is automatically determined by the 74121 one shot. It is fixed at 150 milliseconds. Do the programming carefully. When you are wide awake, or you are bound to make a mistake. The Plus 15 and Plus 5 volt leads must be connected to a **regulated** power supply (at least 1 amp.)

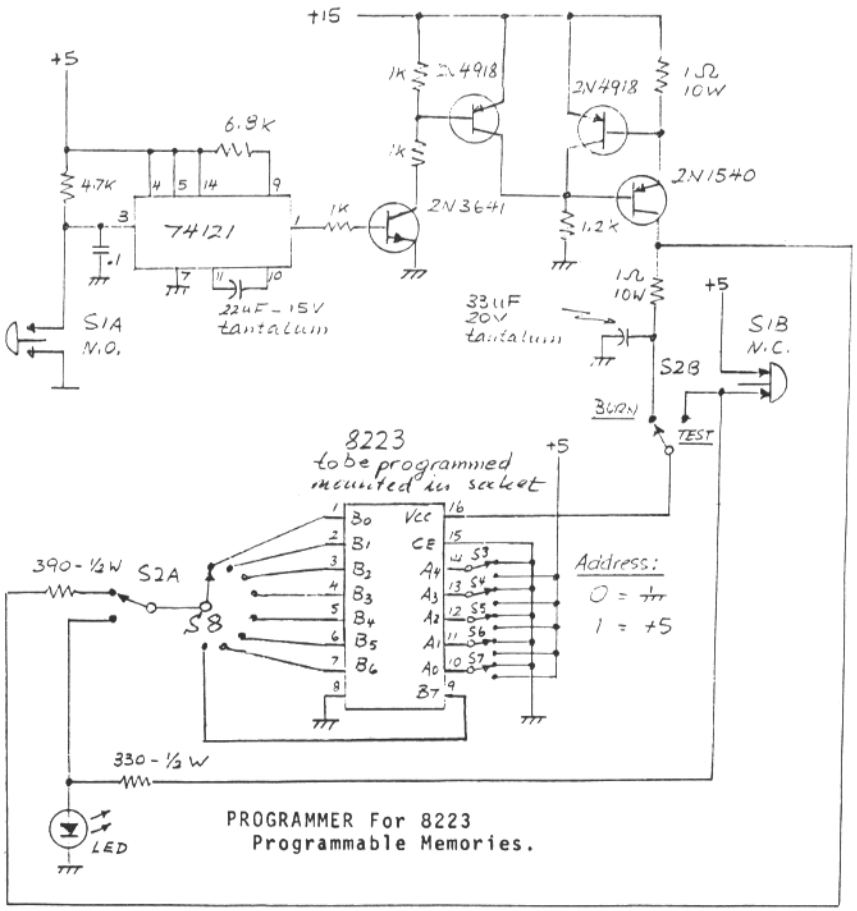
The procedure is as follows:

With the power supply shut off, insert the 8223 into the socket. Set S2 to "BURN". Set the Address switches S3 to S7, and the output switch S8 according to the programming pattern for the first bit. Switch on the supply and press push button switch S1. Now set S3 to S7, and S8 to the next bit and press S1. Continue bit by bit until the whole pattern is programmed into the chip. You can test successful programming by setting S2 to "TEST". Go through the whole pattern again by using S3 to S7 and S8. The L E D will light for a one, and will remain dark for a zero. If the test yields the desired pattern, your 8223 is ready to be used.

A minimum of four 8223 are necessary for the Baudot to ASCII (and vice versa) conversion.

For more information on the make-up of the programming pattern, refer to an article in "Popular Electronics, July 1975."

There is also an article describing a C.W. memory for automatic CW identification using an 8223 Prom in "Ham Radio", January, 1974.



PROGRAMMER For 8223 Programmable Memories.

On the following pages you will find one program each for the four PROMS used in the code converter.

The "A" Column determines the switch positions of the address lines to the PROM, while the "B" Column determines the switch positions of the output lines of the PROM.

Example: To program the letter "Y" into the PROM which translates BAUDOT letters to ASCII letters, proceed as follows:

1. Set switch S2A-B to "Test." Set the PROM output line selector switch to "BO."

2. Look up the letter "Y" on the Baudot to ASCII program. Set the address line switches according to the information in the table.

A4 = High, A3 = Low, A2 = High, A1 = Low, AO = High. (Low is ground, High is plus 5 volts.)

3. Set switch S2A-B to "Burn." Set the PROM output line selector switch according to the table for the letter "Y" to "BØ". Press switch S1A-B. Advance the output line selector switch according to the table to "B3". Press S1A-B again. Repeat at "B4" and "B6". Set switch S2A-B to "Test". With the PROM output selector switch on "BØ", "B3", "B4" and "B6" positions the test LED should light, while in the "B1", "B2", "B5" and "B7" position it should remain dark. Should one of the fuses of the PROM refuse to open at first, attempt, try burning it repeatedly.

Start programming from the top of the table down. When you have one PROM fully programmed, go through the check procedure with S2A-B in the TEST position to verify that the fuses opened according to the program. If the PROM checks out OK, mark it somehow so you can tell them apart later.

82S23 are presently offered on the U.S. surplus market at a reasonable price. These can also be used, but to program these the 390 Ohm ½ watt resistor at the top contact of S2A has to be changed to 4.7 ohm ½ watt, and the plus 15 volt supply has to be increased to 16 volts.

REMEMBER: Be wide awake when programming the PROMS. One wrong fuse open by mistake and your PROM is ready for the garbage.

PROGRAM FOR 8223 PROM BAUDOT TO ASCII, LETTERS

Word	A 43210	Symbol	B 01234567
0	00000	Blank	00000000
1	10000	T	00101010
2	01000	CR	10110000
3	11000	O	11110010
4	00100	Space	00000100
5	10100	H	00010010
6	01100	N	01110010
7	11100	M	10110010
8	00010	LF	01010000
9	10010	L	00110010
10	01010	R	01001010
11	11010	G	11100010
12	00110	I	10010010

13	10110	P	00001010
14	01110	C	11000010
15	11110	V	01101010
16	00001	E	10100010
17	10001	Z	01011010
18	01001	D	00100010
19	11001	B	01000010
20	00101	S	11001010
21	10101	Y	10011010
22	01101	F	01100010
23	11101	X	00011010
24	00011	A	10000010
25	10011	W	11101010
26	01011	J	01010010
27	11011	FIGS	00011000
28	00111	U	10101010
29	10111	Q	10001010
30	01111	K	11010010
31	11111	LTRS ((delete)	11111110

PROGRAM FOR 8223 PROM BAUDOT TO ASCII, FIGURES

Word	A 43210	Symbol	B 01234567
0	00000	Blank	00000000
1	10000	5	10101100
2	01000	CR	10110000
3	11000	9	10011100
4	00100	Space	00000100
5	01000	#	1100100
6	01100		00110100
7	11100		01110100
8	00010	LF	01010000
9	10010	)	10010100
10	01010	4	00101100
11	11010	&	01100100
12	00110	8	00011100
13	10110	0	00001100
14	01110	:	01011100
15	11110	;	11011100
16	00001	3	11001100
17	10001	"	01000100
18	01001	$	00100100
19	11001	?	11111100
20	00101	Bell	11100000
21	10101	6	01101100
22	01101	!	10000100
23	11101	/	11110100
24	00011	—	10110100
25	10011	2	01001100
26	01011	'	11100100
27	11011	Figs	00011000
28	00111	7	11101100
29	10111	1	10001100
30	01111	(	00010100
31	11111	Ltrs	11111110

PROGRAM FOR 8223 PROM ASCII to BAUDOT. LETTERS

Word	A 43210	Symbol	B 01234567
0	00000	Null	00000
1	00001	A	11000
2	00010	B	10011
3	00011	C	01110
4	00100	D	10010
5	00101	E	10000
6	00110	F	10110
7	00111	G	01011
8	01000	H	00101
9	01001	I	01100
10	01010	J	11010
11	01011	K	11110
12	01100	L	01001
13	01101	M	00111
14	01110	N	00110
15	01111	O	00011
16	10000	P	01101
17	10001	Q	11101
18	10010	R	01010
19	10011	S	10100
20	10100	T	00001
21	10101	U	11100
22	10110	V	01111
23	10111	W	11001
24	11000	X	10111
25	11001	Y	10101
26	11010	Z	10001
27	11011	Null	00000
28	11100	Null	00000
29	11101	CR	00010
30	11110	LF	01000
31	11111	Null	00000

Bit 5, 6 &7 all Zero.

PROGRAM FOR 8223 PROM ASCII TO BAUDOT, FIGURES

Word	A 43210	Symbol	B 01234567
0	00000	Space	00100
1	00001	!	10110
2	00010	"	10001
3	00011	#	00101
4	00100	$	10010
5	00101	Null	00000
6	00110	&	01011
7	00111	'	11010
8	01000	(	11110
9	01001	)	01001
10	01010	Null	00000
11	01011	Null	00000
12	01100	,	00110
13	01101	—	11000
14	01110	.	00111
15	01111	/	10111
16	10000	0	01101
17	10001	1	11101
18	10010	2	11001
19	10011	3	10000
20	10100	4	01010
21	10101	5	00001
22	10110	6	10101
23	10111	7	11100
24	11000	8	01100
25	11001	9	00011
26	11010	:	01110
27	11011	;	01111
28	11100	Null	00000
29	11101	Null	00000
30	11110	Null	00000
31	11111	?	10011

Bits 5, 6 & 7 all Zero.

*****

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DOVETRON MPC-1000R (E Series) REGENERATIVE RTTY TERMINAL UNIT retains all the features of the MPC-1000/MPC-1000C Terminal Units plus the benefits of the TSR-100 Teleprinter Speed Converter-Regenerator. Front panel controls permit signal speed selection (60, 67, 75, 100 WPM Baudot and 110 Baud ASCII), Memory Functions (Unload, Reset, Preload and Recirculate), and Character Rate Over-ride. Two front panel LEDs indicate the status of the Memory Section (Full or Empty) and the state of the TD inhibit line. The latter is controlled by a unique automatic memory unload circuit that prevents character over-runs even when pulling tape. The BLANK diddle character is generated by the tri-state mode of the UART regenerator and prevents a signal time-delay or first character error on the outputted signal. MPC-1000R: Commercial: $995.00. Amateur: $745.00. Shipping and Insurance: $9.50 Continental USA. Delivery: 30 days ARO. DOVETRON, 627 Fremont Avenue, South Pasadena, California, 91030. 213-682-3705.

MINI-MANUALS ON FOLLOWING EQUIPMENT, $2.95 each -- M15/19 Wiring Hints and Diagrams. CV-89/URA-8 FSK Converter. IDA-2 Stelma Teletype Distortion Analyzer. AN/SGC-1 FSK Converter. Teletype Gear Guide for all Teletype Corp. equipment. SASE for surplus list. Jim Cooper W2BVE. POB 73. Paramus. NJ 07652.

PRINTED CIRCUIT BOARDS: RTTY SELCAL with TTL logic, (73 Magazine, November 72) $12.00. ST-5A-W/PS (2 boards) $6.25. AK-1, $4.25; CW ID'er (Feb 73, 73 Magazine) $4.75. Logic probe (Dec. 74, 73 Magazine) $1.00. Autostart RTTY encoder and decoder (Jan. 67, 73 Magazine) $11.00. Synthesizer - 75-S Collins Rec. (Dec. 75, Ham Radio) 2 boards $12.50. Instructions and parts list included. S.J. Zalewski, 29307 Red Cedar Drive, Flat Rock, MI 48134. (313) 782-9316.

MODEL 28 ASR's — KSR's, Repurfs - Keyboards, TD's - Printers, Parts - All priced for Hams. All in excellent condition. A.D.M. Communications, Inc., 1322 Industrial Avenue, Escondido, Ca. 92025. (714) 747-0374

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

WAREHOUSE FULL OF MODEL 15's, 19's & 28's. Repers, TD's power supplies, tables, cabinets, and you name it. Can be inspected, purchased and picked up weekends. Phone first - (312) 432-3380. 2012 St. Johns, Highland Park, IL 60035.

DOVETRON TSR-200 TELEPRINTER SPEED CONVERTER-REGENERATOR is a 5" by 5" PC card designed to mount inside the MPC-1000/MPC-1000C and HAL ST-6 terminal units. It consists of a programmable UART Regenerator, a programmable Dual Xtal-Controlled Clock and a CMOS Bilateral Steering Section, which provides automatic data and clock switching when the TU is switched between REC and XMIT. Power requirements are +5/+20 at 20 mils and -12/-20 at 5 mils. Availability: Stock. Amateur list price: $99.50 Postpaid USA. DOVETRON, 627 Fremont Ave., South Pasadena, CA. 91030.

HAL COMMUNICATIONS CORP. announces the DS - 3000 and DS - 4000 series of KSR Video Display Terminals for Baudot and/or ASCII code. Offering error correction capability, multi-speed operation, and 16 lines of 72 characters per line, these terminals employ the 8080 microprocessor in what we believe is the first microprocessor based product offered to the amateur radio communications market. Request data sheet for full information. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, IL 61801. Phone 217-367-7373.

RTTY PICTURE PERF TAPES. Hundreds, including nudes, cartoons, animals, works of art, landscapes, all of the RTTY Art Contests entries. Chad type (fully punched, no lids) 11/16 inch standard Amateur 5-level paper tape. Guaranteed COMPLETELY error-free. Run times from 2 minutes to 10 hours. Listing and info free if request typed on 5-level printer, otherwise send 24 cents in STAMPS. For "Intro Pack" of ten picture tapes of the best, various subjects, various lengths (total run time - 2 hours 12 minutes), send $6.00, immediate delivery, POSTPAID, listing included. Due to popularity of above, "Intro Pack Deluxe" now offered, run time 12 hours 44 minutes, $30.00, shipped PRIORITY mail in USA, surface postpaid overseas. Joe Dickens, WA9UGE, 601 S. Dodson, Urbana, IL 61801.

HAL COMMUNICATIONS CORP. announces the MCEM-8080 microcomputer. The MCEM-8080 is a complete operating system on a single PC board, including serial I/O at RS-232C levels or 20-60 ma current loop, 3 parallel I/O ports, 1024 bytes of RAM, 1024 bytes of ROM containing the system monitor program, and switches and indicators to manually control all bus and control lines. The powerful 8080A CPU and its family of chips are used. The system monitor allows the use of either Baudot or ASCII terminals, and enables the user to load hex files, dump or display memory, insert data in memory and transfer program control to a specific location. Whether you are a RTTY operator turned computer hobbyist, or a computer hobbyist turning to RTTY for a communications link, the MCEM-8080 should be your choice. Write today for full details. HAL Communications Corp., Box 365RJ, Urbana, Ill. 61801. Phone 217-367-7373.

Additional Classified

See Next Page -

THE DOVETRON DCM-100 is a poly-phase Direct Conversion Modem employing BASEBAND techniques that completely eliminate the need for input bandpass filtering and channel filters, permitting the error rate to approach the theoretical minimum. A high degree of selectivity is not required in the companion receiver, since this technique also eliminates all the image windows. The Mark and Space channels are both continuously tuneable from 1200 to 3000 Hertz and a dual LED display on each channel permits fast and precise tuning. Full IN-BAND Diversity provides automatic single channel copy during deep selective fades. Auto Markhold, anti-space and anti-CW are standard. FSK and MARK Autostart is offered, and the MARK Autostart is adjustable for Fast or Slow response. The high level loop supply is strappable for either 60 or 20 mil operation. The phase-continuous AFSK tone keyer may be preset with two different Mark-Space-Shift tone combinations, which are operator selectable from the front panel. Rear panel connectors permit plug-in interfacing of the speed-changing regenerators (including the Dovetron Microprocessor and the UT-4). The TSR-200 and TID-100 may be mounted internally. Twenty of the 25 integrated circuits are identical and all are socket mounted. All digital circuits are high noise-immunity CMOS. Availability: January 1977. Amateur list price: $295.00. FOB. DOVETRON, 627 Fremont Ave., South Pasadena, Ca. 91030.

SELL: TELETYPE LOCAL LOOP POWER SUPPLY, mounts on the LESU $4.50 each. Have six Atlantic Research Distortion Measuring Set DMS-3 w/built in power supply, $30. Have two available. ANUGM 8V Teletype test-set with manual, needs minor repairs $50. Help! I need a manual and some circuit cards for the following Digitech Teledata system, consisting of the following: Teledata power timing unit DT-251A, need PC card #210. Teledata generator, DT-150A. Teledata display, DT-750, need PC card #234. Teledata analyzer, DT-650A. Also need manual for a Sanders display terminal Model 708. Any help will be appreciated. .Lou Carbaugh, WA30JF, P.O. Box 398, New Cumberland, PA 17070.

FOR SALE OR TRADE: MODEL 28 ASR's excellent condition with perf or reperf. Will deliver in New England. Trade or $450.00. George H. Rancourt, K1ANX, White Loaf Rd., Southampton, MA 01073. 413/527-4304.

AUTOMATIC CW ID UNITS. Programs up to 32 dots, dashes, or spaces, easily programmed. All on one board. Less 5V suppiy kit, $13.95, wired and tested $21.95 (your call must be supplied). Interface for above for ST5 or ST6, AFSK or FSK kit $4.50, wired and tested $5.75. Automatic 10 minute resetable timer for ID unit, kit $8.95, wired and tested $13.95. 5V 1A fully regulated short proof TTL supply with transformer and plug in or hard wired board. kit $11.95, wired and tested $18.95. SAVE on all four units, package of above reg. $39.35, kits sale price $35.99. Reg. wired and tested price $60.60, sale price $54.00. Cabinet for above, unpunched (Dozy E box) $7.75 each. Add 75 cents shipping. NuData Electronics, 104 N. Emerson St., Mt. Prospect, IL 60056

TECH MANUALS - $6.50 each: TT-63A/FGC, CV-591A/URR, TS-2/TG; following manuals - $8.50 each: R-388/URR, TH-5/TG, USM-50; other manuals - TGC-14/14A, $12.50; TT-298A/B, TT-299A/B, UGC-38, 40, 41 - $15.00. Model 14 TD manuals, $3.00 each. All manuals mostly new, unused. Thousands more in stock. Send 50 cents (coin) for large 22-page listing. W3IHD, 7218 Roanne Drive, Washington, D.C. 20021.

ST-5's WITH AUTO—START, AK-1 and manuals. HAL kits, ready-to-run in lettered cabinet. $185 or $25, balance UPS COD. David Tancig, 618 W. White St., Champaign, IL 61820

HAL COMMUNICATIONS CORP: Headquarters for electronic 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 XTK-100 or AK-1 AFSK oscillators and the ST-5AS autostart for the ST-5. Full details available in our current catalog. Compare before you buy. Bank Americard and Master Charge plans available. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, Illinois 61801. Phone 217-367-7373.

UT-4 COMPONENTS. Still available, on-board components for K7WTQ boards. Prices prior ads. TIP-30A, lower-cost substitute for MJE-370, 75 cents each. Peter Bertelli, W6KS, 5262 Yost Place, San Diego, CA 92109. 714-274-7060.

DOVETRON TELEPRINTER IDENTIFIER TID-100. Mounts inside of all Dovetron MPC Series (and ST-6) terminal units. CMOS circuitry requires less than 1 mil standby and 8 mils functioning. May be programmed for CW, Baudot or ASCII. 128 bit capacity. Two LEDS indicate CLOCK RUNNING and CODED OUTPUT for easy visual verification of programmed code. All four CMOS chips are socket-mounted and programming instructions are etched right on the circuit board. Includes 50 programming diodes: $34.95 postpaid. Factory programmed with DE and your call: $39.95 postpaid. DOVETRON, 627 Fremont Avenue, South Pasadena, California, 91030 213-682-3705.

RTTY CLOSEOUT - NS-1A PLL TU while they last. Wired/tested $24.95. Board $3.00. All postpaid. SASE for info. Nat Stinnette Electronics, Tavares, FL 32778.

MODEL 28 MACHINES AND PARTS for sale. I would prefer not to ship. Conrad Jahries WB7DHJ, 5681 S. Calann Drive, Salt Lake City, Utah 84121. Phone 278-7057.

500 LABELS ON GOLD PAPER. (4 lines) $1.00 pp. D.M.T. Printing - RJ, 390 Lincoln Ave., Newark, N.J. 07104.

FOR SALE: MODEL 28 TAPE DISTRIBUTOR LXD, sync motor $100.00 Model 28 compact tape distributor. LXDB-4, sync motor $125.00. George H. Rancourt, K1ANX White Loaf Rd., Southampton, MA 01073. 413/527-4304.

COMPUTERS AT A DISCOUNT. IMSAI 17½% off list; Tarbell - 17½%; Polymorphics - 12½%. Factory assembled or kits - same deal. Bill Gulledge, K5UAR, Route 1, Box 264-A, Downsville, LA 71234 (318) 982-5610 8AM-8PM.

EXPERT REPAIR WORK. Any Teletype Corp. model. Repair work $15.00 plus parts no matter how long it takes. Rebuilding by estimate. Write K9WRL or phone (312) 392-2358, ask for Neil.

COMPLETE SET OF COPIES OF THE RTTY JOURNAL. These are all single sheet copies that are not perfect as far as pictures are concerned, but are all readable. My cost was $125.00, will sell for $45.00 and ship. R. H. Wilson, 4011 Clearview Dr., Cedar Falls, IA 50613.

MODEL 28 ASR - MK III, automatic CR LF, 60 wpm, oiled & adjusted. Excellent condition - mint cabinet. Includes extra paper, winder, loop supply, manuals and schematics. Will deliver within 100 miles. $675 or best offer. M. J. Frue, 34063 Ann Arbor Trail, Livonia, Michigan 48150. 1-313-525-9225.

HAL COMMUNICATIONS CORP. announces the ST-6000 RTTY Demodulator/Keyer. The ST-6000 is ideally suited for amateur or commercial service offering fixed 850, 425, and 170 Hz shifts for ease of tuning. Standard low and high tone frequency pairs are available, and active filter design allows the use of any set of tone pairs between 1200-3000 Hz. Crystal controlled tone keyer for stability. Self-contained loop supply RS-232C, and MIL-188-C levels for I/O. Scope or meter tuning. Keyboard operated switch. Selectable ATC, and new DTH (decision threshold hysteresis) circuitry allows optimum performance under the most demanding conditions. Complete flexibility in the interconnection of the demodulator and tone keyer allows separate, half duplex, or full duplex operation. Usable at all data rates up to 110 baud ASCII in standard form. The ST-6000 carries the usual HAL one-year warranty, and is an ideal companion to our new DS-3000 KSR microprocessor based communications terminal. Write today for full details. HAL Communications Corp., Box 365RJ, Urbana, Ill. 61801. Phone 217-367-7373.

MODEL 28ASR FRICTION COMPLETE with TD and Keyboard perforator $400.00 Model 28KSR friction complete $200; with gear shift 60-75-100, $275. Model 28 stand alone typing reperf chadless complete with gear shift 60-75-100 receive only, $125; same with keyboard $225; with keyboard no gear shift, $175. Model 28LBXD stand alone TD complete $100. All above overhauled rewired and ready to plug in. Bill Parker, 984 Amelia Ave., Akron, Ohio 44302.

DOVETRON TSR-100 TELEPRINTER SPEED CONVERTER-REGENERATOR is a 6" by 7" PC card designed to mount inside of any MPC Series Terminal Unit and is intended to provide signal regeneration and UP-DOWN speed conversion. The 18 socket-mounted CMOS devices include a Uart, two FIFO Ripple Memories (80 characters), a programmable crystal-controlled Dual-Clock, and a bilateral steering section that permits solid-state switching between Transmit and Receive. All Uart functions including Parity are switch-selectable. Both sections of the Dual-Clock are programmable for 60, 67, 75, 100 WPM Baudot and 110 Baud ASCII codes. All 8 parallel data lines are available at the output of the Memory section. The TSR-100 also offers Variable Character Rate, BLANK Diddle and memory functions of Preload, Recirculate and Reset. The BLANK Diddle is Uart-generated (Tri-state mode) and does not contribute time delay or first character errors. A unique Memory Unload circuit prevents character over-runs and provides a TD Inhibit. A pair of LEDs indicate Memory status. All signal input and output ports are fully buffered for easy interface to other terminal units. Power requirements: +5/+15 volts at 85 mils and -12/-15 volts at 10 mils. TSR-100: $195.00. POSTPAID Continental USA. Delivery: 30 days or less. DOVETRON, 627 Fremont Avenue, South Pasadena, California, 91030. 213-682-3705.

COMPLETE HAL VIDEO RTTY SETUP. RUD 1005 video display and DKB 2010 dual mode keyboard. Both recent purchases and better than new. $600 WB9VEM, Rt. 3, Box 109, River Falls, WI 54022.

TELETYPE - WANTED: MODEL 28, 29, 35 or other 100 wpm 5 or 8 level machine, with or without TD and Reperf, Write VE 2BTT, Box 185, Fox River, P. Que., GOE 2AO or Phone 418-269-3256.

PUNCHED AND LETTERED 3½ x 6 x 10" Bud box cabinets for HAL ST-5 kits. All holes punched for ST-5, auto-start and AK-1. $15. Don't sweat over hole alignment and punching. Solder your HAL boards and bolt them into my box..David Tancig, 618 W. White St., Champaign, Ill 61820.

DOVETRON MPC-1000 (E Series) MULTIPATH-DIVERSITY RTTY TERMINAL UNIT. The new E Series represents the sixth generation and adds Automatic CRT Intensity Control, Keyboard Actuated Autostart, Automatic Threshold Control for unattended operation, Fast-Slow Autostart, and Autostart Delayed-Timeout to the MPC's MULTIPATH CORRECTOR, IN-BAND DIVERSITY MODES, and the continuously variable Mark and Space channels. All IC's, transistors and Cmos logic elements are mounted in low-profile sockets for ease of servicing and maintenance. Interfacing to the TSR-100 or UT-4 speed converter/regenerator is accomplished by removing two jumpers at the rear panel. Your QSL brings full specifications. MPC-1000 (Amateur) $495.00. MPC-1000C (Commercial) $795.00. Shipping and Insurance: $7.50 Continental USA. Delivery: 30 days or less. DOVETRON, 627 Fremont Avenue, South Pasadena, California, 91030. 213-682-3705.

MODEL 32KSR WITH PEDESTAL, 60-66-100 wpm gears, auto CR and LF, manual. $175 will ship. Neal, K3RVC, 2254 W. Mkt., Pottsville, PA 17901 - 717-622-8617 after 6 P.M.

WANTED: COMMUNICATIONS TYPEBOX and a set of manuals for the Model 28 machine. Glenn Wiebe VE4GN, 43 Staghorn, Thompson, Manitoba, Canada R8N 1G4.

MINI-MANUALS, $3.95 each postpaid - M15/19 Wiring Hints, Diagrams and schematics. CV89/URA8 FSK Converter data. TDA2 Stelma Distortion Analyzer, AN/SGC-1 AFSK Converter, conversion details, etc. Teletype Gear Guide. Schematic for CV57 FSK TU - $1.20 postpaid. Technical Manuals, Teletype Equipment and Parts, Surplus Electronics. SASE for lists. Jim Cooper, W2BVE, POB 73, Paramus, NJ 07652.

TELETYPE EQUIPMENT AND SUPPLIES. Fresh roll paper, $17.50 per case (4-1/2 dia.); $21 per case (5 dia.) plus shipping. Fresh TTY Corp. ribbons, $1.20 pp. Specializing in Model 28 machines, assemblies, parts and service. ASR and KSR cabinets and motors available as well as most machines and assemblies. 28 typing unit - repairable or for parts, $25. SASE for new list. P. Anderson, 115 Boyken Rd., Rochester, MI 48063. 313/652-3060.

COLLINS R 388/URR RECEIVER. $300 or best offer -excellent with product detector. Viditype visual display for VTR or ANY TV set. Mint. $385.00. Claude Sweger W5SHC, Box 1842 Ft. Stockton, TX 79735.

NEW COMPUTER GRADE CAPACITORS, 71,000 MF at 25V $3.00 ea. Edge connectors 12, 15 & 22 pin gold plated $1.00 ea. Orders include 75 cents for shipping. Stamp brings free catalog. NuData Electronics, 104 N. Emerson St., Mt. Prospect, IL 60056

FREQUENCY LISTS - We have over 20 lists covering Voice & RTTY frequencies on HF-Shortwave and VHF-UHF. Lists cover Military, U.S. Government, International Police, Aviation, Marine Stations and More. SASE for catalog. Dept Y Handler Enterprises, P.O. Box CC, Northfield, IL 60093.

FOR SALE: 28ASR. Used 2 hours, $2,000. R. Koistinen, 1513 Excelsior Ave., Oakland, CA 94603. 415-530-7961.

COLLINS 75S3C - BRAND NEW first of October 1976 - Have to sell because of unanticipated medical expenses - New price from Collins distributors now $2300 - Will sell for $1295 - Absolutely brand new. Call K7BV (602) 297-0434 or write 4091 West Red Wing Street, Tucson, Arizona 85704.

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