UT-4 COMPONENTS. Nearly all for K7WTQ boards by return first class mail. FIFO's $14.- AY-5-1013 UART $7. New MC3408L D/A chip $4.50.- UT-4 kit (12) plus diodes, NPN's, opamp, $8.50. XB-6 dual clock TTL kit (12) with 14 iK resistors $8.50. JAN XB-6 crystal $3.50. Four edge connectors $6.50. MJE 340, MJE-370 $1.25 each. Full set (29) IC sockets $8.00.- Also other items in limited supply. All postpaid. Peter Bertelli, W6KS, 5262 Yost Place, San Diego, CA., 92109. 714-274-7060.

TELETYPE EQUIPMENT and SUPPLIES. Model 28 RO $120 up, 28ASR $500 up, 28 Skintite ASR $475, 28 Table $25, 28 TD $125, DXD $100. Other equipment available - SASE for list. Parts and Service. P. Andersen, 2448 N. Wilson, Royal Oak, Mi. 48073. 313/398-5922.

MITE FOR SALE - MODEL TT-298 RO, 60-100 WPM. Standard size or Compact case (see page 5, February 1971 **RTTY Journal**). SASE for details. $250.00, need Model 33. WA5EVH, Box 2746, Lafayette, LA. 70502.

FOR SALE: NEW MOTOR for 32, 33, 35, etc. Teletype part #310140. $15.00 pick-up or $20.00. I pack and pay shipping. (U.S.) Wanted: Bird 43 Watt meter elements. L.W. Alves, WB4JQQ, 2231 Hunter Mill Rd., Vienna, VA. 22180.

TWO MODEL 28ASR's - $650 EACH - Complete excellent condition with keyboard reperforator, dual transmitters, answerback, auxiliary perforator. Also Model 19 - $75 Complete. Excellent condition. Will ship. Box 218, Middletown, Virginia 22645.

SALE: HAL DKB 2010 KEYBOARD - Mint condition; 64 character Buffer. Price $300.00. A.G. Shafer, W4SD. Phone (305) 395-5633.

****

Traffic - Anyone? --

We are searching for Hams interested in handling traffic via RTTY on the Navy MARS circuits. At the present time we are especially in need of people who are equipped with 60 and 100 WPM capability and are available during the daytime to meet traffic schedules. The states which I have jurisdiction over are MI., MN., IA., IL., IN., MO., ND., SD., KE., KS., Co. and WY. Anyone who would be interested in handling traffic via RTTY would be most welcome and may contact me directly. Hugh Dowell, W9WNH, Assistant to the Director, Ninth-Navy-Marine Corps MARS District, 136 E. Troy Ave., Indianapolis, IN 46225.

***

HAL XTK-100 AFSK Unit.

For those who have tried to use the HAL Communications XTK-100 AFSK unit with the UT-4 and found that all you could get was a space tone and no keying, I offer the following fix. Remove R4, a 22K resistor, from the XTK-100 and replace it with a 100K resistor. This will still allow a degree of protection for the 4002 chip and allow good keying of the XTK-100.

Hal Beebe, W9OEQ
20035 Burr Oak Lane
Mokena, Illinois 60448

RTTY JOURNAL
P.O. Box 837
Royal Oak, MI. 48068

FIRST CLASS MAIL

RTTY JOURNAL

July-August 1976

EXCLUSIVELY AMATEUR RADIO TELETYPE

Volume 24 No. 6 35 Cents

"Dick", WA3JTC/ZP5, overseas winner of the Dovetron in the W.A.S. Bicentennial RTTY Contest, shown at the keyboard with Eduardo, CP1BE. Dick spent a week in Bolivia getting Eduardo on RT-TY---this included soldering together an ST-5 kit in his hotel one evening. Eduardo is now active on the band with a very good signal. After a stop in Uruguay to visit Fred, CX7BZ, Dick is again active from Paraguay.

CONTENTS

SARTG RTTY CONTEST - August 21-22.

6th S.A.R.T.G. World-Wide Contest 1976

We have the great pleasure to invite you to join the 6th WW RTTY Contest run by the Scandinavian Amateur Radio Teletype Group. The only change this year is that each VK District counts as a multiplier.

Rules:

1. Test Periods: 1: 0000-0800 GMT Sat. Aug. 21
2: 1600-2400 GMT Sat. Aug. 21
3: 0800-1600 GMT Sat. Aug. 22

2. Bands: Use all bands 3, 5, 7, 14, 21, 28 MHz.

3. Classes: a) Single operator up to 100 w input.
b) Single operator over 100 w input.
c) Multi operator single transmitter (any power).
d) SWL's.

4. Exchange: rst and qso nr.

5. Points: qso with own country five (5) points. Other country in same continent ten (10) points. Other continent fifteen (15) points. In USA, Canada and Australia each call-district will be considered as a separate country. The same station may be worked once on each band for qso and multiplier credits. Only 2-way rtty qso's will count.

6. Multiplier: Use the DXCC List and each district in W/K VE/VO and VK.

7. Scoring: Sum of qso points x sum of multipliers.

8. SWL's: Use the same rules for scoring, but based on stations and messages copied.

9. Logs: Mailing deadline is Sept. 18th, 1976. The logs to contain: band, date time GMT, call-signs, exchanges sent and received, points and multipliers. Use a separate sheet for each band and enclose a summary sheet showing the scoring, classification, your call-name and address. Comments will be very much appreciated. Send your log to: S.A.R.T.G. Contest & Award Manager
OZ2CJ C.J. Jensen
Meisnersgade 5
8900 Randers Denmark.

10. Awards: To the top stations in each class, country, W/K VE/VO and VK call district.

*****

Results - Giant "Flash" RTTY Contest.

1.	I1PYS	13,379,542	18.	K6VZ	681,328	36.	OK2BFS	40,020
2.	K4GMH	8,528,384	19.	VA2OQO	365,040	37.	LA2IJ	39,600
3.	W3EKT	8,933,145	20.	W7KS	314,424	38.	K8UFW	37,800
4.	DLØTD	5,128,512	21.	SM6ADS	258,336	39.	YU2RWR	28,776
5.	VA2JVB	3,879,288	22.	SM5BKA	229,770	40.	K4GJW	21,546
6.	G3VXO	3,665,900	23.	G3RDG	197,418	41.	F6BIQ	19,188
			24.	UK4FAD	167,958	42.	DJ6IR	17,248
7.	I6NO	2,898,135	25.	HB9GS	148,320	43.	VK3KF	13,904
8.	VAØYDJ/4	2,502,162	26.	ON6HF	141,600	44.	VE3BPM	12,090
9.	SMØOS	2,086,080	27.	LA6AJ	123,786	45.	SM6EBM	10,030
10.	K7BV	1,986,944	28.	HA5KFZ	111,456	46.	HA1FFX	9,072
11.	HB9AVK	1,686,443	29.	OK2BJT	108,900	47.	DM2BRM	8,740
12.	DL8VX	1,172, 320	30.	GW3IGG	83,232	48.	OZ8GA	7,344
13.	HA5KEM	1,026,270	31.	YU2RHW	80,500	49.	HA6KNB	2,232
14.	DJ6JC	983,664	32.	OK3KFF	72,930	50.	OHØNI	448
15.	VAØPFP	[illegible]	33.	OK1MP	69,020			
16.	K5QBO	828,072	34.	VE2QO	67,184			
17.	IØZAN	743,256	35.	W7BCT	48,146			

*****

Last of the BIG Spenders ---

The bands are relatively quiet again after the terrific action on the Bicentennial RTTY W.A.S. contest. The Dovetrons have been awarded, the plaques have been shipped and the Certificates will be sent later when we get an idea of how many will be needed.

The contest created action but it also brought up the gray area of how large a prize could be without the winner receiving compensation for use of amateur equipment. The rule has never been defined and past contests offered a wide variety of awards of various value. To settle the question we asked for a ruling from the FCC.

Their definition of an award or prize is a - Medal - Plaque or similar item of sentimental value but very little resale value. As the FCC is anxious to let the amateurs govern themselves we will certainly do nothing further to cause any concern. Any future contests will stay within their definition of prizes and we hope that all other contests will use the same criteria for awards.

***

Mainline XK-2 Crystal AFSK.

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

INTRODUCTION:

A number of excellent AFSK units are presently available for amateur use. Most of these use some form of R/C oscillator that has separate adjustments for mark and space tones. Even if accurately set with a digital counter, they can drift some from cold to warm, or from one day to the next.

Crystal AFSK units require no adjustment at any time. They are now competitive in price to other types of AFSK units, due to the introduction of low cost digital logic.

THE MAINLINE XK-2:

This crystal AFSK uses a low-cost 3 MHz crystal and six IC's. At current prices the IC's cost typically $2.95 and the crystal typically $3-$4. A programmable synthesizer consisting of two 74193 dividers plus control gates offers 170 shift, 850 shift and a special shift for C.W. ident. Special features include a mark-space balance pot, output level adjustment to match your transmitter and zero-crossover keying to eliminate keying transients. The square waves are converted to sine waves by a highly effective – yet simple and inexpensive – low pass filter with virtually no harmonic content. This feature is highly desirable if planning to use AFSK with a SSB transmitter on HF.

OTHER AFSK UNITS:

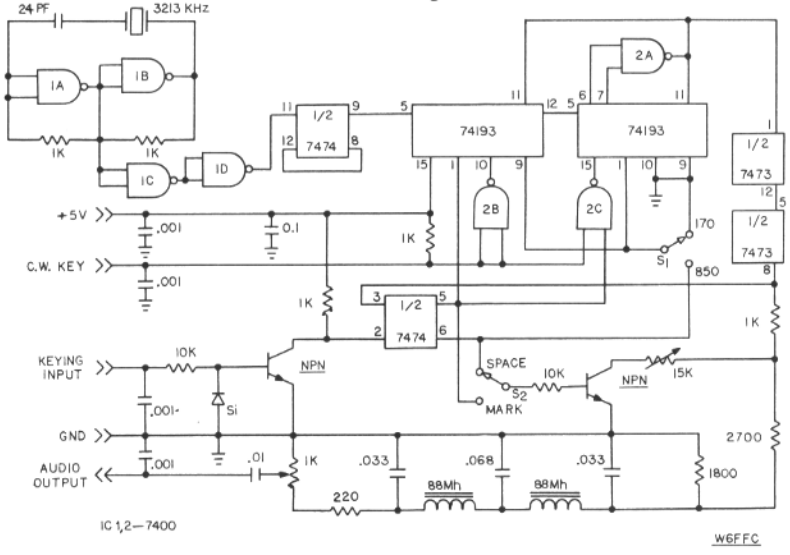
If you have need for tones other than 2125, 2295 and 2975 that the XK-2 offers, you may prefer a unit that allows you far wider latitude – where you would use 4 separate crystals and select one for mark, one for space for the main shift, a third crystal for space for the second shift and a fourth crystal for the C.W. ident shift. Such a unit offers very great versatility, but of course four crystals cost considerably more than just the one. At the same time, a more sophisticated and complex digital-to-sine wave converter would be needed, adding somewhat to the cost. An active filter would still be needed to smoothe the ripple from the D/Sine converter.

MARK-SPACE BALANCE:

Switch S2 allows either mark or space output tone to be independently varied via the 15 K pot to meet the needs of your particular transmitter. The control is so effective it could actually be used for "make-and-break" sending. In most cases there would be no need for an external switch, perhaps a jumper on the board itself would suffice, or even a switch on the rear of the unit that was accessible but rarely used. The chances are excellent you would not change its position once you found which suited your equipment.

ACTIVE LOW-PASS FILTER:

An active low-pass filter was tried with good results. It took substantially more



MAINLINE XK-2 CRYSTAL AFSK

components than the simple filter shown which uses inexpensive 88 Mh. toroids, yet was less effective on roll-off. There is some question these days as to how to define various filters with regard to their prospective performance, but this filter gives equivalent results to a 10-pole active filter. One modest problem with most active filters is the additional plus and minus 12-15 volts normally required.

DISADVANTAGES:

Having a crystal AFSK can have some modest disadvantages for certain applications. If you wish to operate transceive, for instance, many so-called transceivers really do not exactly transceive. For instance the Collins S-line even in transceive continues to use separate BFO crystals in the two units. In my own equipment, they are 36 Hz. apart. That may be close enough for many readers, but with equipment of that type a variable AFSK that may be adjusted easily to compensate for the equipment being used has inherent advantages. (Actually the Collins S-Line can be made to exactly transceive by controlling the transmitter BFO from that of the receiver with a simple mod.)

Few single unit transceivers really transceive, often pulling slightly off frequency in transmit due to lowering the line voltage with the extra power consumption. If your single-unit transceiver has "offset tuning", "RIT", "Clarifier control" or some similar means of intentionally resetting the receiver frequency slightly without affecting that of the transmitter, you then could easily use crystal AFSK. In any event crystal AFSK is a natural for repeater use on 2M, or surely for any RTTY activity on 2M.

CONCLUSION:

The MAINLINE XK-2 AFSK offers 170 and 850 shift both as well as a special shift for compulsory C.W. ident. There is nothing to adjust except the mark-space balance and output level. Most comments relative to the AK-2-AFSK (Jan. 76 RTTY JOURNAL) apply to the XK-2 as well, their main difference being the type of oscillator used.

(Note: Boards are available only through EDI in Salem, Oregon. See ad in this issue.)

*****

WHAT'S A WRU?

WERNER FEHLAUER ,WB2BRB
7000 Fitspatrick Dr.
LAUREL , MD. 20810

Frequently a newcomer to RTTY asks the question "What's a WRU?" To say that it is an automatic answer back system probably doesn't answer the question very well. To begin with, the letters W-R-U are generally accepted to be an old abbreviation for "Who are you?" but to the modern green key enthusiast it means a lot more.

What is a WRU? It is an automatic message generator that can be activated by received off-the-air signals. Either electronically or via a mechanical stunt box, a precise sequence of received characters can be decoded to close a momentary switch which then starts the message sequence. This message can be a tape loop on a tape distributor, a mechanical drum accessory, or an electronic generator that will send out a short, unique message. This message will let the originator of the WRU request know that he did in fact reach the intended receiver.

The call up sequence for a WRU was, for many years, Ltrs-call sign (last 3 characters) - Figs-Blank-H, or seven unique sequential characters that had a ridiculously small probability of occurring in random, normal text. This unique pattern was used to insure that only those WRU call ups that were intended occurred, and were not caused by garble or interference conditions. Recently, another convention has appeared, that of Ltrs-call sign-Ltrs-Blank-W. One reason for this change was that the W would print on the page copy, and was easily recognized as a WRU request; conversely, the upper case H was not a printing character on some machines, and on others was printed as an #. More subtly, the use of a Ltrs-Blank sequence appears to be an advantage in decoding for computer interfacing with RTTY, over the earlier Figs-Blank pair.

A WRU is best used on Autostart frequencies, where it can be used to check propagation conditions, check your own equipment, and to determine if the station you want to communicate with is on frequency and receiving. A WRU can be mis-used, and people who do so are very poor Hams indeed. A WRU should always be protected by at least a double backup turn off scheme. This is to prevent illegal, frequency blocking carriers in case the end-of-message transmitter turn off fails to function. In my station, I have a turn off sequence (figs-blank-H) included in the short WRU message followed by an electronic signal that the message has ended. This is then protected by a ten second time out circuit; the transmitter itself has a ten minute time out control. This amounts to 4 levels of protection, and is not unreasonable in order to maintain good relations with other stations.

In summary, let's go over how to call up a WRU. After listening to make sure the frequency is not in use, turn on your transmitter and send, at or close to "machine" speed, about 20 Ltrs characters (to make sure the receiving end turns on and is in machine synchronism) followed by the sequence (for calling **my** WRU) Ltrs-B-R-B-Figs-Blank-H. **Immediately** turn off your transmitter and go into a receive mode. If you have reached my station, it will respond with a short Ltrs WB2BRB#. For those who prefer the newer convention such as Ltrs-B-R-B-Ltrs-Blank-W, I have coded my model 28 stunt box to respond to this as well. Remember, a WRU is a useful tool to a green keys operator, and like all good things, should not be abused.

***

A RTTY Message Generator with BCD Input.

ROBERT C. CLARK,WA4VYL
930 Chestwood Ave.
Tallahassee, FL. 32303

Introduction

The device described here generates a fixed message format in Baudot (five level teleprinter code) at any desired speed, with the feature that any of the characters generated may be entered from an external device in the BCD (binary coded decimal) code. The BCD format is used extensively in digital frequency counters, multimeters, thermometers, and clocks; and this unit may be used wherever a printed record of such measurements is desired. One of the features of this message generator is that fixed characters may be intermixed with the variable BCD characters. Thus, machine functions (carriage return, line feed, figures shift, letters shift, space, etc.) and other fixed printing characters may be used with the characters from the measurement device. For instance, the format of the unit described here (although it may be modified to suit the builder) is:

Figs XX/XX Space Figs XXXX Ltrs Z CarRet Line Feed.

The X's represent characters generated by a digital clock calendar. On March 13 at 1457 GMT the printout would appear as follows: (Figs) 03/13 (Space) (Figs) 1457 (Ltrs) Z (Car Ret) (Line Feed).

The dilemma as to which block represents the month and which the day is solved by arranging the data in order of significance (this suggestion by Cole Elsworth, W6OXP). The first two digits are the most significant (month), followed by the next most significant (date), followed by the time (with the least significant figure, minutes, in the last position). If the format suggested here is too restrictive, the sequence may easily be expanded to 32 characters rather than the 16 used here.

Several obvious uses of this device present themselves. A permanent record of multimeter or frequency counter measurements over a long period of time may be desired. At this location, it is desired to record the time of incoming autostart teletype messages and have a printed verification of the time of each identification (the beginning and end of each transmission). Another example of the use of this device would be to record both the frequency of an oscillator and the ambient temperature (from a digital thermometer) for systematic temperature compensation of the oscillator.

Circuit Description

The basic circuit is presented in figure one. A low on the "Start" input latches U7a, U7b in the "Run" state, enabling the clock U1, the 7493 dividers U2 and U3, the 74151 multiplexer, U4, and locking the BCD data present in the latches (figure two). The data on pins 4, 3, 2, 1, 15, 14, 13, and 12 of U4 are transferred, one at a time in the order indicated, to the output (pin 5) and the inverted output (pin 6) as the binary data on pins 9, 10, and 11 progresses from 000 to 111. The format selected is a one bit start pulse, from 000 to 111. The format selected is a one bit start pulse, five data pulses, and a two bit stop. The two bit stop pulse will cause a slightly slower rate of data transmission than the usual 7.42 teleprinter code (1.42 bit stop pulse), but each character is sent at the desired speed (only the time between characters is longer). No advantage is seen in trying to generate a 7.42 code, and the associated circuitry would be considered a definite disadvantage. Pin 4 of U4 has been grounded so that the first bit (start) will always be a low (space) and pins 12 and 13 have been tied to the five volt supply to provide the required stop bits (mark). The other five data pins are controlled by the output of an 8223 Field Programmable Read Only Memory (FPROM). The code for the characters to be sent (Baudot in this case) is contained in parallel within the 8223 memory. The particular character present at the output of the 8223 is selected by an address code on pins 10, 11, 12, 13, and 14 of U5. The 8223 may be programmed by the user by "burning" internal fuses to program a "one" output (a "low" is the state if not programmed) using a programmer such as the one suggested in figure six (an adaptation of one described by Signetics), or the unit may be purchased programmed to user specifications at little more than the price of the chip. The characters (figure two) are programmed so that if a BCD "3" (0011) is to be encoded, its negation (1100) is presented to U5 on pins 10, 11, 12, and 13; selecting the Baudot "3" (01000011). A little more than one-half of the 8223 memory (17 characters) has been coded with the Baudot equivalents of the negated BCD code and seven additional characters.

Fifteen characters remain in the second half of the memory. Thus, all 32 Baudot characters could be programmed as long as the positions corresponding to the BCD data remain in the same positions.

After each eight counts of the eight bit binary divider (U2, U3) a new pin on the 74154 (4:16 demultiplexer) goes to a low state, starting with pin 1 and progressing to pin 17. The output lines of U6 are used to select the character (actually the negated BCD code for the character) to be presented to the address lines of U5. In figure one, 16 characters are, in succession, presented to the 8223, converted to Baudot code, presented to the 74151 (U4) and scanned (converted to serial form). As shown in figure three, another 74154 may be added (and selected by the Chip Enable - pin 19) to extend the sequence of characters to 32.

Figure two indicates the character gates which select the characters to be sent. The low on one of the output lines of U6 is inverted by one section of a 7404 (hex inverter) and the resulting high is used to enable a 7401 (or 7403

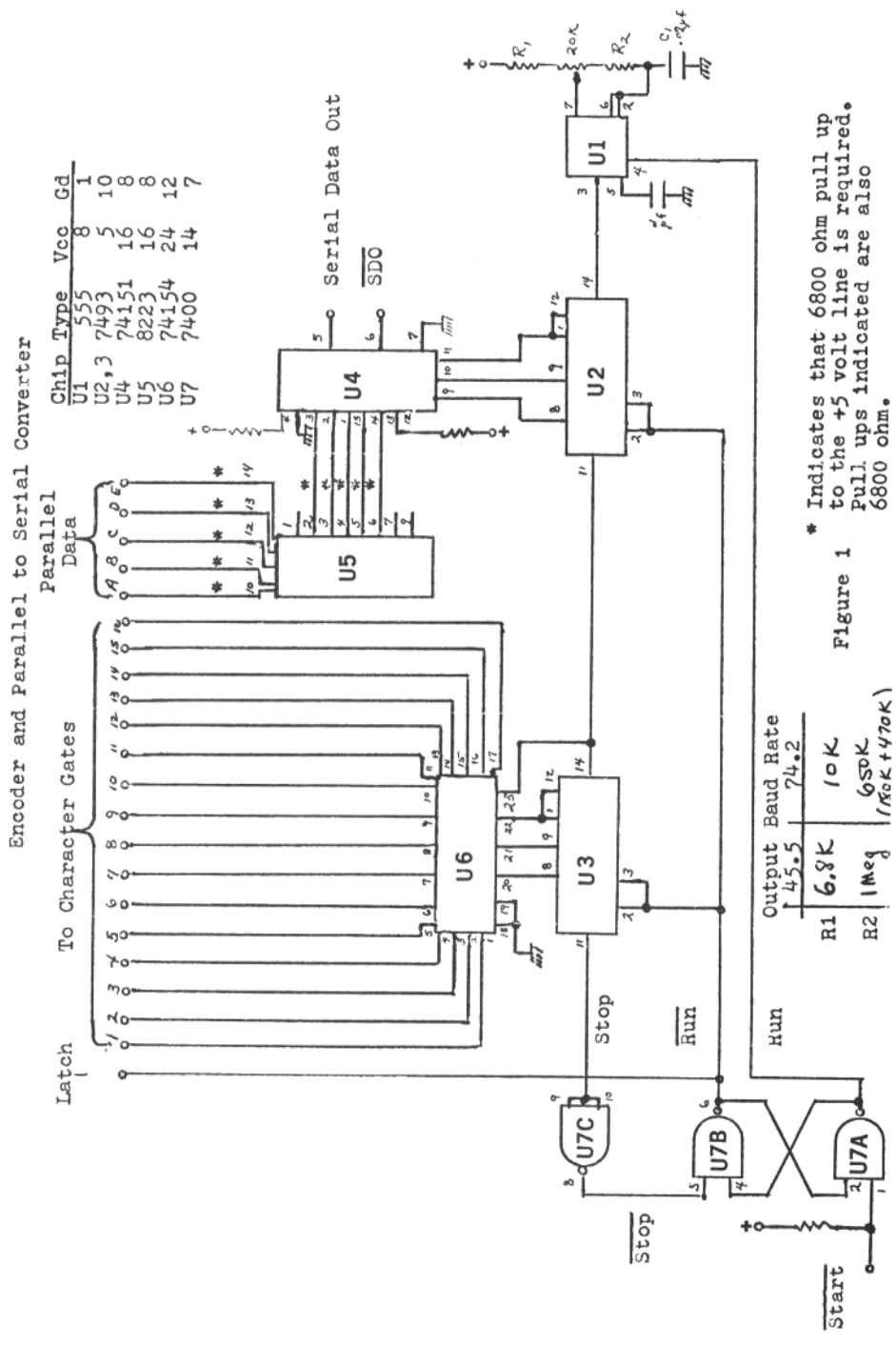


Figure 1

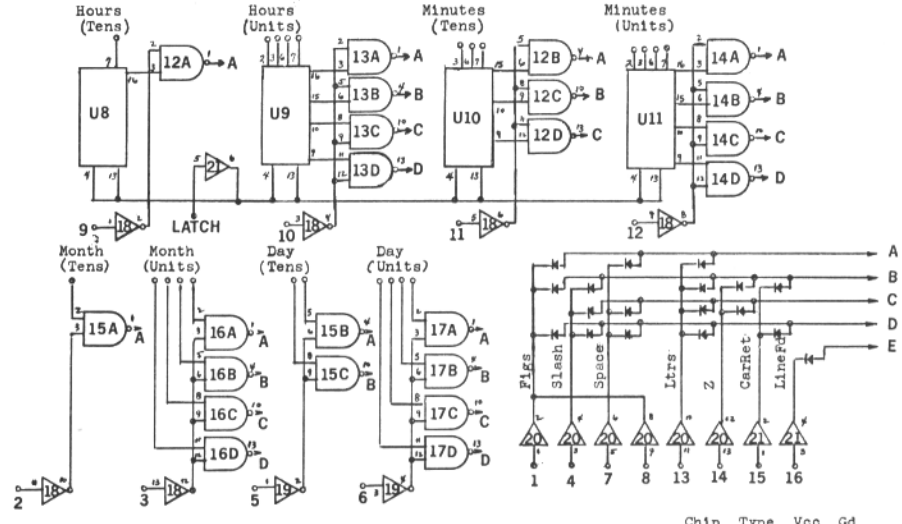


Figure 2
Character Gates

Chip	Type	Vcc	Gd
U8-U11	7475	5	12
U12-U17	7401	14	7
U18, 19	7404	14	7
U20, 21	7407	14	7

with appropriate pin changes) N and gate to pass the BCD data (now inverted by the 7401) from a single digit of the measurement device to the 8223 address lines. In the case of a fixed character, a 7407 section (buffer) is used with diode or "gages" to pull down the necessary address lines. With germanimum diodes, the address lines are pulled down to about .5 volts, sufficiently low to be considered a "zero".

The gates and buffers controlling the U5 address lines are all open collector types to allow "ortying" the outputs. One pull up resistor is required for each of the address lines as the open collector gates and buffers do not provide the internal pull up that is found in many TTL devices. Likewise, the 8223 outputs are open collector, and the data lines between U4 and U5 require pull up resistors.

Four 7475 data latches have been indicated in figure two. When the clock lines of the 7475's are high, data present at the input is transferred to the output. Whatever data is present at the time the clock line changes from high to low is "latched in". The use of the latches eliminates the possibility of the data changing during the print cycle and the associated possibility of an undefined state being presented to the encoder. Only four of the quad latches are used by the author (to latch the four digit time display) as it was considered very unlikely that the data for the day or month would change during the print cycle. The 7475 latches are shown arranged for a situation where the BCD data are all presented simultaneously to the message generator. If the measurement device uses a multiplexed BCD format, it will be necessary to lock each data latch at a time when the appropriate data is present.

Several techniques may be used to reset the "Run" latch at the end of the sequence of characters. The one chosen in figure one is to use the last bit of the eight bit binary divider to reset the latch. Following the transmission of the last (sixteenth) character U3 pin 11 goes high for the first time and is inverted with the resulting low applied to the rest input of the "run" latch, disabling the clock, the 74151 multiplexer (and thus holding the output in the mark state when idle), and resetting the 7493 dividers to the zero state. A most undesirable technique that has been seen in several publications (and used by this author until discovered as the source of problems) is similar to that used in figure one, but capacitive coupling is used from the last counter to the reset. This system is quite susceptible to noise. When the author used this system on another unit, it started and stopped quite at random.

The output waveform of the 555 (U1) clock is not symmetric, and hence is not used to address U4, but the output of the first binary divider (U2 pin 12) is symmetric. The output of the clock is set to the baud rate desired for the output data (i.e. 45.45 hz for 60 words per minute and 74.18 hz for 100 words per minute). If an accurate frequency counter is not available, the frequency of the clock may be varied until correct print is received by the teleprinter. Then, shift the teleprinter range finder to the lower end of its usable "range" and adjust again. Check the print with the range finder set at the upper usable limit. Continue the process until the message generator produces perfect print over the known usable range of the printer. The 555 clock has proven more than adequate with reasonable supply voltage and temperature variations. It does not work well with wide temperature variations as when exposed to outside temperatures.

Components

The integrated circuits are all available

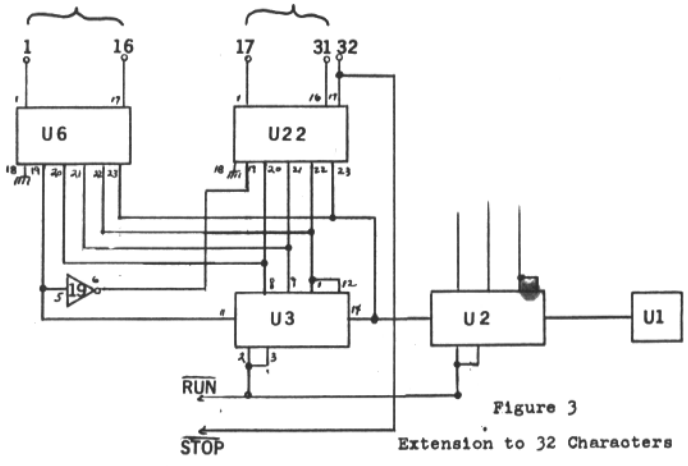


Figure 3

Extension to 32 Characters

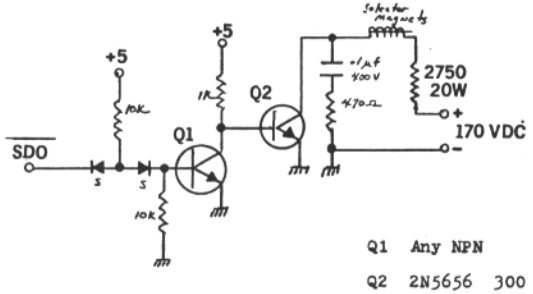


Figure 4

High Voltage Keyer

Q1 Any NPN

Q2 2N5656 300 V keyer

Diodes 100 PRV Silicon

Resistors ¼ watt unless marked otherwise.

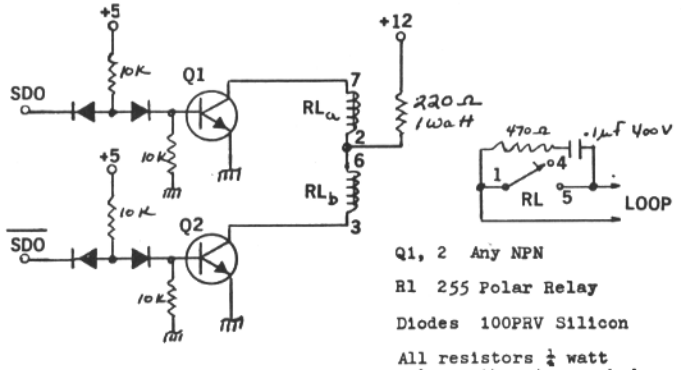


Figure 5

Relay Keyer

Q1, 2 Any NPN

R1 255 Polar Relay

Diodes 100PRV Silicon

All resistors ¼ watt unless otherwise marked.

12 volt supply need not be regulated.

S1-S5 SPDT Slide Switch

S6 One pole six position

S7 Three pole three position

S8 Momentary push button

Q1 Any NPN

Diodes 100 PRV Silicon

I_1 Lamp or LED

R_1 Select to limit current through I_1

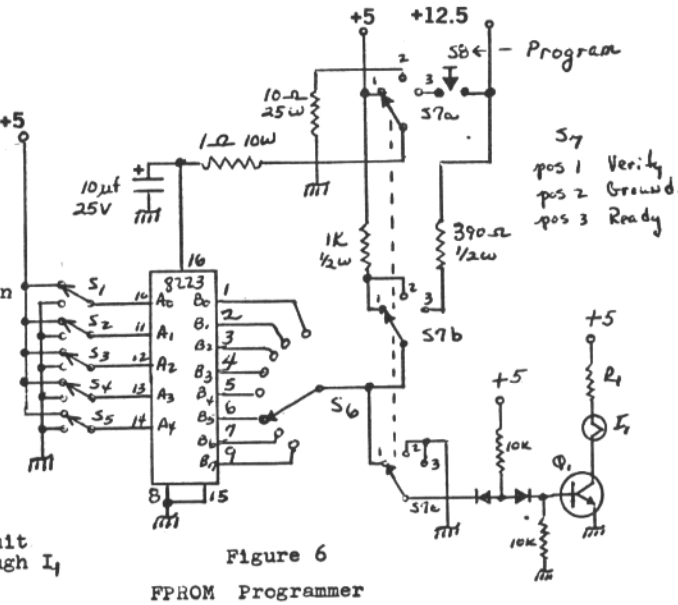


Figure 6

FPROM Programmer

	Address					Output								Char.
Pin	10	11	12	13	14	1	2	3	4	5	6	7	9	
	1	1	1	1	1	0	0	1	1	0	1	0	0	Ø/P
	0	1	1	1	1	0	1	1	1	0	1	0	0	1/Q
	1	0	1	1	1	0	1	1	0	0	1	0	0	2/W
	0	0	1	1	1	0	1	0	0	0	0	0	0	3/E
	1	1	0	1	1	0	0	1	0	1	0	0	0	4/R
	0	1	0	1	1	0	0	0	0	0	1	0	0	5/T
	1	0	0	1	1	0	1	0	1	0	1	0	0	6/Y
	0	0	0	1	1	0	1	1	1	0	0	0	0	7/U
	1	1	1	0	1	0	0	1	1	0	0	0	0	8/I
	0	1	1	0	1	0	0	0	0	1	1	0	0	9/O
	0	0	1	0	1	0	1	1	0	1	1	0	0	Figs
	0	1	0	0	1	0	0	0	1	0	0	0	0	Space
	1	0	0	0	1	0	1	0	1	1	1	0	0	/ X
	0	0	0	0	1	0	1	1	1	1	1	0	0	Letters
	1	1	0	0	1	0	1	0	0	0	1	0	0	"/Z
	1	0	1	0	1	0	0	0	1	0	0	0	0	CarRet
	1	1	1	1	0	0	0	1	0	0	0	0	0	LineFd

Note: Fifteen characters remain for additional characters that may be desired.

Figure 7

Programming Chart

from a number of sources. Current prices on the logic indicated in figures one and two is about $15. Suppliers of the 8223 will, in most cases, provide either an instruction sheet for user programming of the chip or supply a chip programmed to customer specifications for a slight extra charge. Dodd Digital Design (234 Waples Park - Fairfax, Va. 22030) has advertised programmed chips for $6.95; other references have appeared in publications of individuals or businesses willing to provide programmed chips. All resistors are one-quarter watt. The timing capacitor C1 should be polystyrene for best stability, but high quality mica or mylar capacitors will do.

Connections to External Equipment

Figure four shows a high voltage loop driver for direct connection of the message generator to a teleprinter. Figure five indicates a relay driver for keying a loop, where it is not convenient to ground the loop at the keying point as they would be required in figure five. Several circuits for keyers using Opto-Isolators, which allow the freedom to key the loop at any point using transistors rather than a relay, have been published. Of course, the direct output from pin 5 or 6 of U4 may be used if the device to be keyed is TTL compatible (lead length should not exceed twelve inches for TTL devices).

Programming the FPROM

A simple programmer, a modification of one described by Signetics, is shown in figure six. A programmer is a worthwhile piece of equipment if you plan to use a number of 8223 devices. If only a single chip is to be used, it would be worthwhile to find someone with a programmer to do the work. Short leads are important in the programmer, particularly those which will handle the 12.15 volt supply. The author had some difficulty in making the 8223 program until the 12.5 volt and ground return cables were decreased in length. Due to the internal structure of the 8223, a voltage drop of any significance on the 12.5 volt line will prevent the chip from programming. The 8223 is arranged as 32 eight bit characters (or "words"). The particular word to appear at the output (BO-B7) is selected by the address lines (A0 - A4). For any given address (32 possible addresses - one for each word) one eight bit word appears on the output lines. Switches S1 through S5 select the particular word to be programmed or verified. Switch S6, a single pole eight position rotary switch, selects one bit of the eight bit output word for programming or verification. S7 is a three pole three position rotary switch. The three positions are: Verify Program, Ground, and Ready to Program. In the "Verify" position lamp I1 indicates the program state of the selected bit, either zero (lamp off) or one (lamp on). The programming procedure is as follows:

1. Insert Chip in programmer and apply voltages (5.00 + - .25 volts and 12.5 + - .5 volts)
2. With S7 in the "Verify" position, select the address of the word to be programmed with switches S1 through S5.
3. Select the particular bit of the word to be programmed with S6.
4. Move S7 to the "Ground" position and then to the "Ready to Program" position (pin 16 must go to ground before 12.5 volt line is applied).
5. Quickly press and release S8 (momentary push button) to program the bit as a one. (If S8 is held closed, the chip will begin to over heat)
6. Return S7 to the "Verify" position and verify that a one has indeed been programmed.
7. Select the next bit of the same word to be programmed with S6 and repeat steps one through six until the entire word is programmed.
8. Address the next word to be programmed with switches S1 through S5. Continue to address new words and repeat steps one through seven until the entire chip is programmed.
9. Disconnect voltages and remove chip.

The specifications for the 8223 call for, at most, one second with the "Program" switch closed. Thereafter a 25% duty cycle must be imposed. If the steps outlined above are followed, and not rushed, the 25% duty cycle requirements will be satisfied. The 8223 is a hearty chip and as long as the chip is not allowed to overheat, it is unlikely that it will be damaged. If a particular bit fails to program on the first try, the procedure may be repeated. To date, the author has programmed six of the 8223 chips without a single failure. Be sure to use regulated voltages and keep the leads from the power supply to the programmer short. The program for the chip used in the message generator is listed in figure 7.

Extensions

Several articles have appeared using the 8223 to generate a fixed message format for either RTTY or CW. The observant reader will notice that figure one includes all the logic necessary for one of these units by adding a second 8223 for the fixed message format. The address lines of the second 8223 (pins 10 through 14) will be addressed directly by the 7493 binary dividers. The output lines of the two 8223's may be paralleled, but only one chip may be enabled (pin fifteen grounded) at a time. The message generator in use by the author consists of four 8223's for fixed format and another used as the clock/calendar encoder described in this article. Another section has been added which selects the particular chip to be enabled (also using 8223's) at a given time in the message. This allows portions of the different programs to be mixed to produce a number of different messages. The unit in use provides five different messages, each containing the clock/calendar program, up to 128 characters long and containing both the RTTY message and the required CW identification.

Credits

The author wishes to thank Cole Ellsworth, W6OXP, for his suggestions on time/date printout format. Paul Satterlee, WA5IAT, read the original draft and made several helpful suggestions that have now been incorporated.

***

VHF RTTY NEWS

Ron Guentzler, W8BBB, Editor
212 Grandview Blvd.
Ada, OH.45810

This "month" we have several items of news. It seems that there is a lot of activity across the U.S., but very few people want to write about it. Our thanks go to everyone who has sent us information.

Jim Labo, KØOST, Littleton, CO has news about the Denver area: "The primary FM-RTTY system is the Denver Amateur Radio Teletype Society (DARTS) repeater located on Squaw Mountain with the call WRØACX. Squaw Mountain is about 30 miles west of Denver and about 6000 feet above Denver. Needless to say, the coverage from that high a location is fantastic, like most of NE Colorado from Cheyenne on the north, to Sterling on the east, to Colorado Springs on the south. The system is carrier access on the Colorado standard pair, 444.20 MHz input and 449.20 MHz out. The RTTY standards are narrow shift with 2125/2295 Hz tones.

The last listing showed 15 users in the last six months, including WBØGAI, WØHFX, WAØHTR, WØMT, WAØRLQ, KØYDO, WA2YUN, and WØZLO. All of the above are using autostart. Like all FM systems, it has its peaks and lows, but someone can be found on every night.

"On two meters there is a different story. Operation on 146.700 MHz is intermittent at best. WOLRN, WAOYIH, and WAORLQ are known to have "70" capability. My 146.700 MHz transmit crystal was back ordered five weeks ago, which tends to be discouraging. I am presently writing some articles on FM-RTTY for the local FM repeater club paper to try to encourage more RTTYers to get on "70" and 450 MHz.

"Several different individuals have expressed interest in a 10/70 RTTY repeater, however, nothing firm has developed yet. I will be putting on a temporary 450 MHz to 146.700 MHz repeater to test some ideas. It should be on by the time this gets in print."

From John Anderson, W8ADE, in Marion, OH: "WB8MNS in New Washington, OH., and I run RTTY on 146.700 MHz every Friday at 8 P.M. on 850 shift. We can't seem to get many people on here. We also like to run picture tapes. We also think there is a need for a RTTY repeater in Lima, OH. It is possible for us to work Lima if they get a repeater. The rig here is the Genave GTX-200 and the antenna is a simple Ringo Ranger. If we get more people on the air we will get a 2 meter beam. My autostart is on from 7 to 10 P.M."

RTTY activity in the Harrisburg, PA. region is presented by Ronald Boltz, K3TZJ: "As of this writing, our repeater, WR3ACO, will soon be on the air. It will be RTTY only and will not accept voice or non-standard shift. It will be 147.975 MHz In and 147.375 MHz Out, 850 Hz shift only. The repeater will have anti-space and will reprocess all input tones for retransmission and will require a 2125 Hz Mark tone for access. The repeater will be on the air and fully operational by the end of May and will cover much of the eastern PA area from its site on the local channel 33 TV tower on the top of the Blue Mountain, North of Harrisburg.

"Most of the repeater construction and design work is being done by WA3AVX, W3JJU, K3KJS, and several others. The antenna work will be done by WA3WXP and myself, K3TZJ.

"At present, there are about 35 stations in the area with RTTY equipment that will be using the repeater. We are now operating on 146.700 MHz simplex and about 10 stations are on 24-hour autostart."

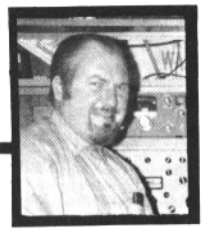
And, finally, from the east coast we have from Dick Peters, WA1PracticallyWorldFamous,Norfold, MA.: "I'm pleased to announce the formation of a VHF RTTY net in the southeastern Massachusetts area. Our congenial group meets Wednesday evenings at 8 P.M. on the WR1ABN repeater; 147.69/147.09 MHz. Transmissions are at 60 speed, 850 Hz shift, and may be up to ten minutes long before the repeater times out. During the rest of the week, the repeater is used for brief autostart messages. For "rag-chewing", we QSY to 147.48 MHz simplex. Reaction to our operation has been favorable, and we hope that through your column we can spread the word to other RTTY operators in the area who are looking for some VHF activity.

We have one technical note that came to mind while this column was being put together. As you all probably know, when using an SSB rig and an AFSK unit to generate an FSK signal (on HF, VHF, or UHF), it is necessary to greatly reduce the drive because an SSB TX puts out full power only very briefly during voice peaks, but will put out full power constantly during AFSK operation and will simply burn up. However, when running AFSK into an FM transmitters, there should be no worry at all about the constant operating obtaining with RTTY. The reason is simple: An FM TX puts out full power independent of the modulation. Another way to say the same thing is this: With SSB, the output power is directly proporational to the modulation - no audio, no output - lots of audio, lots of output. With FM, the output power is constant.

Thanks again for the information. We have been receiving comments indicating that the information being given here is used. 73, have a nice summer, and CUL. RG.

***

RTTY-DX



John Possehl, W3KV, Editor

P.O. Box 73, Blue Bell, PA.19422

Hello There . . .

1974 World RTTY Champion . . . Numerous awards as winner or among top scorers in all the available RTTY Contests . . . Ed, W3EKT, now adds still another to his long list of accomplishments in RTTY with . . .

Plaque Nr. 22 for 100 RTTY DXCC

to

Edward L. Bruns W3EKT

Ed was first licensed as K8ZSZ in 1961 when living in Toledo, Ohio. The RTTY bug bit in late 1964 and a model 15 machine was acquired at about that time. With all the bits and pieces finally assembled, the first QSO was in 1965 with activity mainly on the VHF bands, Six Meters in particular. Twenty-one States were confirmed on that band which is quite commendable considering the scarcity of teletype at that time on any of the bands, much less VHF. A move to Maryland in 1967 brought the present call, W3EKT. RTTY activity was mainly on Air Force MARS frequencies until 1972 when he participated in his first Contest, the perennial Sweepstakes sponsored by the CARTG. Ed has scarcely missed a Contest since and it started him off toward the DXCC. Equipment consists of the Drake R4C, T4XC, homebrew linear and four element Yagi beams for 15 and 20, dipoles for the other bands. The marks and spaces come from a Model 28 KSR and 28 ASR which in turn are activated by a TT/L2 converter. In addition to his Contest and DX activities, Ed has been doing a terrific job in helping amateurs in many parts of the world to get started on RTTY and many of the new countries coming on the band from time to time are made possible through his efforts. World RTTY Champion. Tops in the RTTY Contests. DXCC RTTY. What next Ed?

W A C ALL 14 Mhz.

Nr. 30 - Jeff Morris - G3YDR

While Jeff made this WAC from his home QTH you will no doubt see another listing before long for his Malta activities as 9H1EL.

In the time lapse since our last meeting here, there has been some fantastic RTTY activity, much of which comes from countries that have never been on the mode previously. This coupled with generally excellent band conditions, permitted many to increase their DX totals by at least a half dozen or more new countries.

In mid April, Dick, WA3JTC/ZP5, made his promised trip to Bolivia. The activity had been planned to come from CP1HD but a sudden business trip took this chap out of the country just as Dick arrived with his gear. All was not lost however, as the XYL of CP1HD got Dick together with Eduardo, CP1BE, and of course you know the rest. Bolivia was very QRV for several days and by happy circumstance Bill, KZ5BH also happened to be in La Paz at that time and got the Kleinschmidt machine all lined up to factory new condition. QSL's can go via Dick or direct to . . .

Eduardo Arroyo M.
Casilla 1324
La Paz Bolivia.

Look for some more interesting activity by Dick and Fred, CX7BZ later in the Summer from down the Falkland Island area.

Roberto TG9AD and Gerry TG9GI have been keeping Guatemala on the active list. They are presently signing with the TD76 prefix, a commemorative call for the Guatemalian Amateur Radio Society. Cards for Gerry can go via . . .

P.O. Box 762

Guatemala City and for Bob via Box 514.

We also had a fleeting printout from TG9VN on the page one day, but no additional information available on this station at this time.

HI8DAF makes the third active station from the Dominican Republic and QSL's for Domingo can go to . . . P.O. Box 951, Santo Domingo D.R.

There were some excellent signals coming from HP2XNW in early April but nothing heard since then. If you did manage a QSO he is listed as . . . Richard McClung, Nuevo Cristobal, Calle Margarita 339, Colon Rep. of Panama.

Trinidad has been put back on the active list by Cyril, 9Y4VT, who puts out a booming signal to all points. QTH is Cyril Balwah, 18 Joga Grant St. Vista Bella, San Fernando, Trinidad.

It was certainly a surprise to copy Fred, HR2AFK, again after his QRT of several years. He is putting out an excellent signal on 45 baud but with 850 hz shift for the time being until he obtains a narrow tone plug-in for his AFSK. Fred is still at P.O. Box 254, San Pedro Suia, Rep. of Honduras.

Roy, PJ3AR, left for PJ7/FS7 as planned on 29 May, but unfortunately the arrangements he was making for a lightweight machine fell through at the last moment. He did take along his ST-5 and hopes to somehow find a machine there and get it going to give many of you two new countries. He will be there for at least six weeks, so it would be well to point the beams in that direction from time to time and no doubt Ivan, PJ3SF, will be able to keep us informed if anything develops.

8P6AY, 8P6HE, and 8P6GC, are all active from Barbados and Jim, VP2AB, and Mickey, VP2AR, are a good bet for a QSO with Antigua.

A QST QST to all these stations in Central America and the Caribbean. The boys in Japan are looking for you daily at around 1200-1300 GMT. If you can swing your beams in that direction at those times, they will certainly appreciate it.

In the dim past, Ascension Island was a cable termination in the middle of the South Atlantic with one active amateur who was hardly ever active. The coming of the space age however, made it an extremely important link in the tracking of the satellites and manned space missions, and in recent years, amateur activity increased tremendously. On CW and SSB, that is. Mid May brought the first RTTY activity from this rare location. Richard, ZD8RD and Peter, ZD8PL have been quite busy trying to give as many as possible a contact from there. The equipment in use belongs to Richard and consists of a Creed 7B, ST-6, FT 101, and linear and the boys put out a beautiful RTTY signal. You are apt to find either one at the keyboard now but Peter is due to return to the UK very soon so the operating will be handled by Richard, who expects to be there for another year or so. QSL's can go via BBC, Ascension Island, South Atlantic Ocean or a much faster way is via Ascension Island Amateur Radio Club, ZD8AR. P.O. Box 4308, Patrick Air Force Base, Florida 32925.

A short hop over to the mainland of Africa comes up with a few pleasant surprises. First time RTTY activity from Kenya by Alex, 5Z4TV, took everyone by surprise. He was fighting off a bout with Malaria but should again be active when you read this. P.O. Box 30592, Nairobi, Kenya.

On the East coast of Africa another first on RTTY is FL8KW by Jacques, using 50 baud and narrow shift. His home call is F6CFU but QSL's can go to Box 573, Djibouti, French Somaliland.

Finally, from just about the geographical center of Africa, and extremely rare in any mode, is 9X5AN. Alain is also operating 50 baud and his QTH is P.O. Box 449, Kigali, Rwanda.

Wait a moment, we almost left one out. With your beam in the same direction, you may also snag Karl, DK5EC/ET3. It is best to QSL to his home QTH in Germany. Word is around that Karl may soon be in Egypt and hopes to operate /SU.

It hardly seems possible that there can be anything else new to report . . . but there is. Toward the end of May, the RTTY community was astounded to print signals from JY4JW. While his signals were extremely strong, Wassim was having difficulty with the machine keyboard and none of us could print his copy although his tape reader was putting out perfect copy. In a few days and with the assistance of several of the boys in Europe, Wassim was getting out excellent copy. As soon as he receives the proper gearing, he will be on 45 baud altho the 50 baud he is presently using is no problem for the DX'er. Wassim has indicated that the near future may bring RTTY activity by HRH Al - Hussein ibn TALAL, King of Jordan (JY1), whom as you may know, is quite active on SSB. QSL's can go to P.O. Box 3236, Amman, Jordan.

A DXpedition was scheduled to go to Andorra from 27 thru 29 May by a group of Swiss ARTG headed by HB9APJ. The call was C31JA but at this writing, we are not sure if it came to pass or not as they were not printed on this side of the pond at the times indicated.

Events coming up. SARTG RTTY Contest 21-22 August. Rules probably on other pages of this issue. Paul, HB9AVK, will make another trip to Liechtenstein (HBO) for this contest. Mark your calendar now for 2-4 October for CARTG "Olympics 21 SS".

Best wishes for a pleasant Summer or Winter, as the case may be.

73 de John

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HONOR ROLL

DXCC CONFIRMED

ON4BX	152	I5WT	120
ON4CK	149	JA1ACB	118
W3KV	145	W8CQ	118
W5QCH	136	I5ROL	114
WA3IKK	132	W1GKJ	106
DK3CU	128	W4CQI	104
W5EUN	128	K6WZ	102
W3DJZ	127	W4YG	100
W2LFL	125	K8YEK	100
G6JF	123	DL8VX	100
I5KG	120	W3EKT	100

OVER 50 COUNTRIES CONFIRMED

1. W8JIN	106/97	17. K4VDM	72/68
2. W4EGY	105/97	18. SMØOY	70/68
3. I8AA	99/90	19. EI5BH	77/67
4. OK1MP	90/87	20. SM6AEN	70/67
5. DJ8BT	91/85	21. K4YZV	76/66
6. F5JA	93/83	22. SM7CLZ	65/61
7. K3SWZ	87/81	23. WØMT	64/61
8. OZ4FF	88/77	24. WA3JTC/ZP5	70/60
9. HB0AVK	92/74	25. ZL2ALW	63/58
11. F6ALL	90/73	26. W9OEQ	91/56
12. CE3EX	86/73	27. WØHAH	68/56
13. OH2HN	77/70	28. I5CLC	80/54
14. KH6AG	86/69	29. WØMP	58/53
15. G8LT	73/69	30. JH1ISF	61/52
16. ON5WG	85/68	31. HB9AKA	62/51
		32. ½9CAT	54/50

LESS THAN 50 COUNTRIES CONFIRMED

1. HB9ACQ	61/48	14. DK4ZF	61/29
2. WA9WJE	57/46	15. DLØAK	49/28
3. JA1DI	60/43	16. WAØTAS	42/28
4. HB9HK	56/42	17. WAOYDJ/4	55/27
5. UA9PP	67/40	18. WB4MAV	52/27
6. PY2CYK	45/39	19. K4GKW	53/25
7. VK6PG	53/38	20. W4ZCM	41/25
8. WA4TPU	56/35	21. PY6HL	33/23
9. G3LDI	56/33	22. DK1NB	67/22
10. ON4CZ	60/31	23. W4ZLH	35/22
12. W1MX	46/31	24. K7MIC	28/20
12. PAØWDW	54/30	25. VE2QO	41/19
13. SM6EZD	35/30	26. WOLZT	33/14

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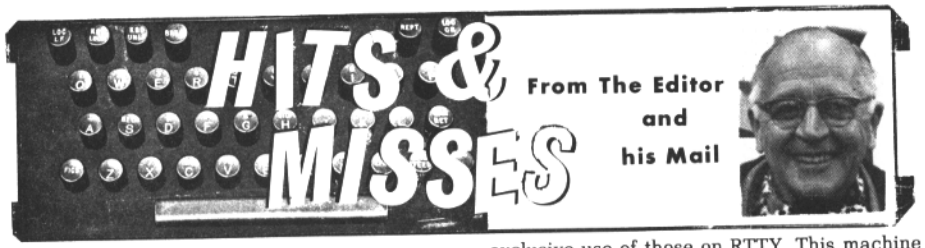

A recent proposal of the FCC would limit band width of any type emission in certain portions of the band. The RTTY sections are set at 350 Hz. This would ban wide shift operation but would permit any baud, speed or system within this range of frequencies. The proposal also limits the width frequency deviation in other parts of the bands. This is another idea of the FCC to further deregulate and simplify amateur operations. Comments are being received on the proposal.

***

Dear Dusty:

After many years, NCARTS, has ceased its activities. NCARTS mission was to further RTTY activities and assist in the distribution of information and machines to the novice teletyper. Our function is no longer required since it is now covered by so many qualified organizations. For this reason, it was felt impractical to continue NCARTS as an operating organization.

At a recent meeting of the Directors, we resolved to transfer our treasury to another non-profit corp. On the 2nd of April, 1976, I presented a check for the remainder of our funds to Chuck Towns and Bill Eitel - two old NCARTS members themselves - for deposit in the account of PROJECT OSCAR INC. I am sure all members will agree that we could find no better place where our funds could continue to support RTTY activity and the amateur program in general. At a time when we are getting ready to fight for our frequencies on an international basis, the OSCAR Satellite is something that ALL nations are aware of. This could well be a major factor in our favor.

Sincerely,
F.R. Heward, K6EER, Pres.
No. Calif. Amateur Radio Teletype Society

***

Interested amateurs in the Southern California area have formed a group to promulgate the useage of RTTY on both HF and VHF bands. The ultimate goal of this formally organized group is to stimulate interest in this mode of communications, to assist each other in the location and procurement of available surplus equipment, and to use the expertise of those knowledgeable members of the group in assisting those who might wish to become indoctrinated in this intensely spellbinding mode of hamming.

There is at present an active two meter repeater, which has been set aside for the exclusive use of those on RTTY. This machine has excellent coverage extending from Ventura to San Diego and under marginal conditions to the east almost as far as the desert areas. Additional equipment and constant upgrading is being performed to extend the coverage even further. This repeater is open to all who wish to take advantage of its capabilities.

Interested persons may establish contact with Mr. Steve Phillips, WA6TVA. His address is 272 Villanova Road, Costa Mesa, California 92626. Or Frank Iversen, WA6 ZCQ. Frank's address is 1312 Micheltorena Street, Los Angeles, Calif. 90026. For those who wish to call by phone, Frank's number is 213 663-1581, after six in the evenings.

***

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 35 cents 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.

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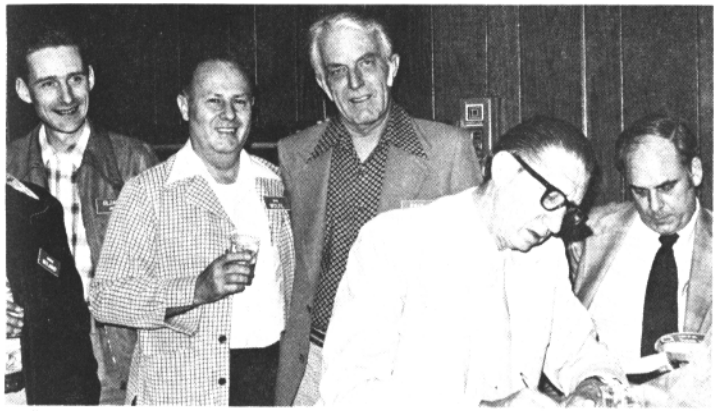


"Joe" DL2AK "Bud" W2LFL "Paul" KH6AG "Paco" XE1WU "Hank" W6SKC

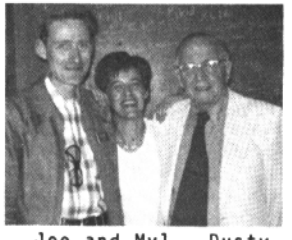
Irv W6FFC

Art XE1LL

Jean F6BEX Dusty W8CQ Mac JH1ISF Joe DL2AK

John W3KV

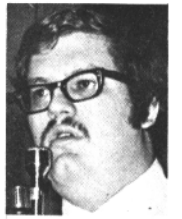
Ron W8BBB



Joe and Myl DL2AK Dusty W8CQ

RTTY FORUM

Keith W8SDZ
Moderator



Tom WB9RWQ

John WA5NYY

Mike WA9WJP

PHOTOS COURTESY of W8MBB and W3KV

It was the same old story – Bigger and Better than ever: the 25th Silver Anniversary Hamvention with over 12,500 registered, 128 exhibitors and literally acres of Flea Market! The RTTY Journal hospitality suite was crowded, including visitors from Hawaii, France, Mexico, and Japan. Plan now for next year – the dates will be April 29, 30 and May 1.

RTTY FORUM RECORDING NOW AVAILABLE

The recording of the 1976 Dayton Hamvention RTTY forum is now ready. The tape is available ONLY in standard half-track mono at 3-¾ inches per second. This can be played back on any standard half-track or quarter-track reel-to-reel machine. The recording is about two hours forty five minutes in length Anyone who would like a copy should send one roll of "Time and a half" (1800 ft.) ¼ inch recording tape on a standard seven inch reel. Send it in a reusable container or mailing bag. Enclose stamps in sufficient amount to cover the original weight plus one additional ounce of return postage. The extra weight is a set of printed copies of the visual materials associated with each of the talks. Send NO money. There is no charge for this service. Send your tape to: Keith B. Petersen, W8SDZ, 1418 Genesee Ave., Royal Oak, Mich. 48073.

***

Automatic 10 Minute ID Timer.

NEIL PETLOCK,K9WRL
104 N. Emerson St.
MT. PROSPECT, IL. 60056

When conversing on the air, we found that we would constantly be forgetting to ID at 10 minute intervals. The 10 minute automatic timer eliminates this problem. When sending pictures where the ID is preferred at a certain spot, a switch may be put on the output.

HOW IT WORKS: The NE555 should set for .6 seconds from leading edge to leading edge. This is accomplished by changing the value of R2. The first 7490 divides by 10 to give 6 seconds, the second gives 60 seconds, and the third 600 seconds. Three 7490's were used to allow the NE555 to operate at a more repeatable frequency and eliminate the need for large valued timing capacitors. The 74121 gives a one-shot on the lagging edge which occurs every 600 seconds. This pulse is about 3.5 mili seconds long.

CONSTRUCTION: The unit mounts on a single PC board 2¾" by 2 1/8". The only external connections are 5V, ground, and outputs Q or Q. Either Q or Q may be used depending on if you need an active high or low to trip your ID unit. We ran the output to a switch to inhibit the output when an automatic ID may not be wanted.

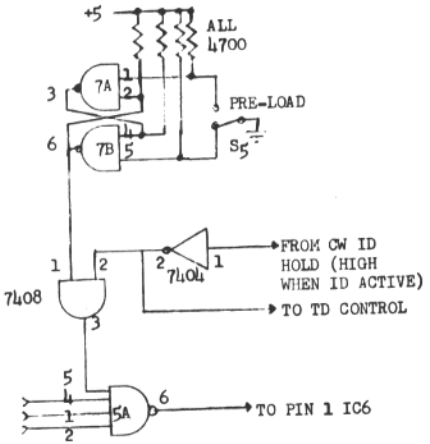
Many thanks to Tom Steinke, K9WYG for his help in designing the circuit.

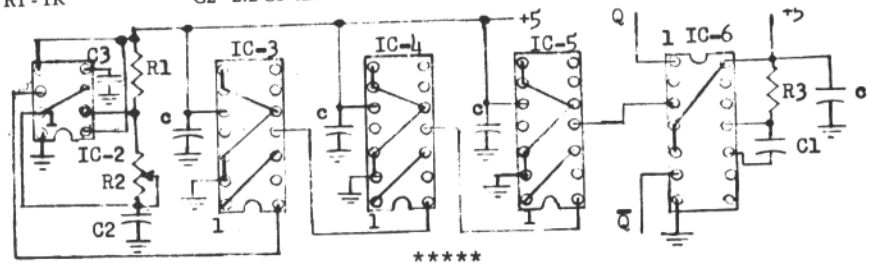
Parts list for 10 Minute Timer:

No ICI in unit
IC2 - NE555
IC3, 4, 5 - 7490
IC 6- 74121
R1 - 1K
R2 - 25K pot
R3 - 4.7K
C - .1 disc (4)
C1 - 47 UF tantalum 6.3V
C2 - 2.2 UF tantalum 25V
C3 - .01 Mylar

Board and parts are available for $8.95 from NuData Electronics, 104 N. Emerson St., Mt. Prospect, IL. 60056.

The below circuit may be added to the UT-4 for memory load and output stop while a CW ID goes out. The hold in our case was a high during the ID cycle and a low when the ID was not in use. The inverter may be dropped if your system is inverted to mine.





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Source for Cheap Crystal.

A note that may be of interest to some: I needed an 850 shift crystal for my K4EEU AFSK generator; so, I experimented and found that the 3.58 color crystal from a discarded color TV would work just great. Simply parallel two capacitors (across the crystal), one 150 mmfd, and a 0-100 trimmer (mica compression type) and the desired frequency is easily reached. Substituting the 150 mmfd with a 220 enabled the use of the same 3.58 crystal for the mark frequency, 2125 Hz. This same combination will allow 425 Hz shift, tuning easily to 2550 Hz. In checking by trial and error, I reached frequencies as low as 1400 Hz and of course clear up to 3580 Hz. This arrangement worked for two weeks without turn-off and did not drift even one cycle!

I hope that this information may be of use to others. Incidentally, I just wrapped the wires around the pins of the crystal (wires to the trimmer and leads from the disc capacitor, that is) and inserted the crystal in the socket that was on the original K4EEU board.

Harold E. Jeffrey, WA9SLL
418 N. Jefferson
Knightstown, Ind.

***

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ST-6 CW IDENTIFIER designed for HAL ST-6 terminal unit. Plug in circuit board measures 2.75" x 5". Will work with most other keyers. Easiest to program 127 bit diode matrix, adjustable speed, sidetone speaker output. Can be programmed for RTTY-ID. Complete kit for HAL ST-6 includes 50 programming diodes: $26.50. Wired and programmed: 36.50. Flesher Corp. P.O. Box 902, Topeka, Kansas 66601. BankAmericard, Master Charge, phone orders accepted (913 234-0198). No COD.

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MINI-MANUALS ON FOLLOWING EQUIPMENT, $2.95 each -- M15/19 Wiring Hints and Diagrams. CV-89/URA-8 FSK Converter. TDA-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.

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Additional Classified
See Next Page -

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OA-5 SOLID STATE TU includes autostart and AFSK oscillator. See February and September 1974 issues of "RTTY JOURNAL". Drilled and plated boards, $15.00; board with parts, $110.00; completed unit, $225.00 FOB. Ken Simpson, WA8ETX, 3700 Mountview, Alliance, Ohio 44601.

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