

**..CLASSIFIED ADS**

**PLL TERMINAL UNIT.** Complete with PLL, loop supply, FSK output, meter and cabinet. Kit \$66.95. ASSEMBLED \$79.95. 12 pin plug in PC boards alone (2) \$5.75. Edge connectors for boards \$1.10 each. NuData Electronics, 104 N. Emerson St., Mt. Prospect, IL 60056.

**HAL COMMUNICATIONS CORP.** announces the new RVD-1005 Visual Display Unit, with the features of the proven RVD-1002 and some new features to boot, such as: Automatic CR-LF on space after 34th character (prevents splitting of short words), and speed indicator circuitry which times the incoming signal and causes an LED to light to show which speed switch to select. Loop and low level inputs for compatibility with any TU. Combine the RVD-1005 with the DKB-2010 or the RKB-1 for the ultimate in noiseless, reliable, reception and transmission of Baudot coded TTY. BankAmericard and Master Charge accepted. HAL Communications Corp., Box 365RJ, Urbana, Illinois 61801. Phone 217-367-7373.

**LOADS OF MODEL 15KSR TELETYPES** only \$25.00. Also quantity of model 19s with tables, power supplies, TDs, Reperfs, character counters, etc. Only \$65.00. C.B. Goodman Co. 5454 South Shore Dr. Chicago, IL. 60615. Phone anytime - (312) 752-1000, extension 516.

**HAL COMMUNICATIONS CORP.** has moved to bigger facilities to serve you better. Our address is the same, but please make note of our new phone number 217-367-7373.

**UART REGENERATIVE REPEATER KIT \$21.99** with buffer driver for parallel output add \$2.35. XB-6 clock for rec. speed control kit. \$28.95. Plus 5, minus 12 volt reg. supply for above \$29.95 kit. Any one 12 pin plug on PC board for above \$2.75. Edge connector for board \$1.10 each. NuData Electronics, 104 N. Emerson St., Mt. Prospect, IL 60056

**SELL TWO 28's, ONE FLOOR MODEL** with three speed shift, and other one is table model at 60 WPM all with non overline and auto car ret. also 2 CV-483/URA-17 solid state tu's (dual diversity operation, also 2 R-390-A Receivers perfect cond. and one Central Electronics 200-V Transmitter. Make offer. Purchaser topick-up. All equipment good condition. W4AIS, 306 Thornwood Dr., Tavlors, S.C. 29687.

**RESISTORS 1/4 watt 5% ANY COMMON VALUE** 1-99 4¢ each. 100-499 3¢ each. 500-1000 2.5¢ each. Min. order \$2.00. NuData Electronics, 104 N. Emerson St., Mt. Prospect, IL 60056

**CIRCUIT BOARDS: RAM Message Generator,** Jan. 1975 Ham Radio. Solid state substitute for both tape distributor and reperf interconnects with your ST-5 or ST-6. Has accurate character counter and auto and manual controls. Main board message capacity 146 characters and aux. board now available uses five more RAMS for a total of 329 characters. Main board \$10, Aux. board \$4 -- \$5 if ordered separately. Includes parts list, picture, and info on cheap solid state keying relay substitute. Bert Kelley, 2307 S. Clark Avenue, Tampa, Fla. 33609

**NS-1 PLL DEMODULATOR** (Oct. '74 Journal) complete unit wired, tested \$25.95 ppd. less switch, meter power supply. Board only undrilled \$4.75. Nat Stinnett Electronics, Box 1043, Tavares, FL 32778.

\*\*\*\*\*

**FIRST CLASS MAIL**

Cole Elsworth, W6, Dec 723  
 Box 2059  
 Huntington Beach, CA 92647

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



# RTTY

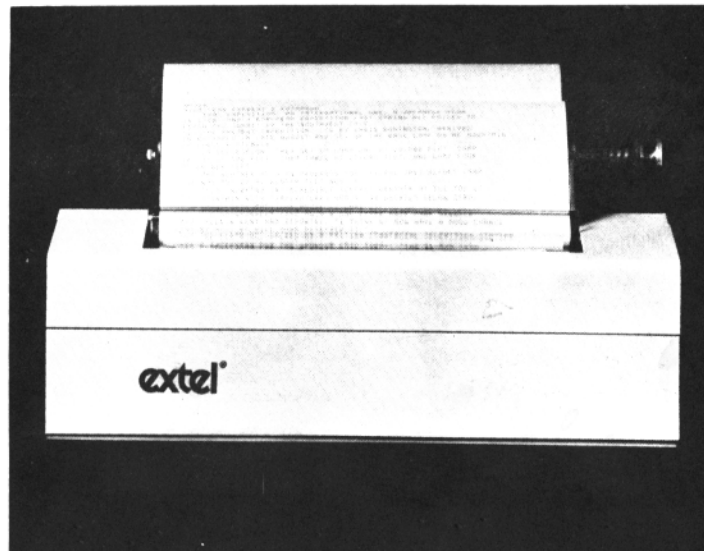
July Aug 1975

## JOURNAL

**EXCLUSIVELY AMATEUR RADIO TELETYPE**

**VOLUME 23 No. 6**

**30 Cents**



**Series AF Teleprinters:**

The Series AF teleprinters employ a 69-74 character-per-line format and print on 8½ inch paper. Optionally, this Series may use an 80 character-per-line format. The AF Series is also available with ribbon, for use with standard teleprinter paper.

All EXTEL teleprinters of the A-Series print by means of a 5 x 7 dot matrix on pressure-sensitive paper or with a ribbon on regular paper. Three copies can be conveniently printed. All teleprinters are fully compatible with standard teleprinter signals and equipment.

\*\*\*\*\*

**CONTENTS**

NEW PRODUCTS - - - - -	2
B.A.R.T.G. DX CONTEST - - - - -	3
RATT LINE RM-200 UART-FIFO PROCESSOR - - - - -	3
SIMPLE AFSK KEYING CIRCUIT-- - - - -	7
RESULTS-GIANT FLASH DX CONTEST - - - - -	7
TG-1 AFSK GENERATOR - - - - -	8
A TTY DIGITAL CLOCK ( PART 2)- - - - -	9
VHF NEWS - - - - -	12
COLOR BURST XTAL UART CLOCK- - - - -	13
DX NEWS AND HONOR ROLL - - - - -	14
DAYTON HAMVENTION-PICTURES - - - - -	17

## New Dovetron Demodulator

The DOVETRON MPC-1000 MULTIPATH-DIVERSITY RTTY Terminal Unit is the amateur-commercial version of a high performance signal data converter designed to meet the U.S. Navy's requirement for error free copy thru the various anomalies of HF multipath propagation.

The new design is basically two solid-state receivers, one tuneable to the audio mark and the other tuneable to the audio space tone. Each channel has its own calibrated front panel control (1500 to 3200 Hz.), which permits the use of any mark or space tone combination within this range and any shift between zero and 1700 Hz.

All channel and low pass filters are accomplished with active integrated circuits and no toroids are required.

A proprietary MULTIPATH CORRECTOR provides automatic synchronous regeneration at any baud rate from zero to 50,000 Baud without internal or external clocks. This MPC provides normal copy even with up to 90% pulse stretching in both channels simultaneously.

In-Band Diversity (mark-only or space-only) operation is automatic during deep selective fades and error free copy is provided even with a continuous interfering tone in either channel.

In addition to the automatic mark-hold, anti-space, anti-cw and anti-fade circuits, the MPC-1000 also incorporates a noise correlator for suppression of impulse noise, a signal loss indicator, a RY generator and a phase-continuous, sine-wave AFSK tone generator.

The dual autostart circuit is front panel selectable to actuate on receipt of a Mark signal, or upon receipt of a RTTY signal with mark-space transitions. Time out in Mark is 20 seconds. In FSK, time out is 60 seconds. The latter is useful where the commercial press stations often "mark" for hours at a time.

The internal 2" CRT provides a "pencil thin" cross display and readily displays selective fades, pulse stretching, channel QRM, and intermods, as well as transmitter problems, such as faulty keying, inadequate power supplies, etc. In the absence of a signal, a dot deflection circuit deflects the dot to the bottom of the CRT's screen to prevent a CRT screen burn. The CRT is also used to measure and adjust the internal 180 volt loop supply to 60 Ma. by pressing a front panel test button.

Two buffered FSK outputs are provided: EIA Standard RS-232c ( 12 volts, M/S) and Mil Std-188C ( 6 volts, S/M). Since these FSK outputs are inverted in respect to each other, the operator has the choice of right side up or inverted outputs.

Four front panel LEDs monitor the condition of the loop keyer, the mark and space channel filters, and the signal loss circuit. In the transmit mode, the loop keyer LED also indicates that the keyboard is actually keying the AFSK and FSK outputs. The signal loss LED indicates when the TU has gone to automatic mark-hold without a marking signal, i.e., the signal circuit has failed. It also provides a visual indication of optimum mark hold threshold under noisy conditions.

The RY generator functions as a built-in self test for the TU, permits easy adjustment of the AFSK tones to the desired frequencies using the CRT and the calibrated front panel channel VFOs, permits a string of RYs to be sent on the signal circuit for circuit adjustment, and as well, for local machine maintenance, re-linking, etc.

Rear panel connectors are provided for an external scope, an external regenerator, remote control of the transmitter and receiver, remote control of the TU by external switching circuits, CW ID of the AFSK and FSK outputs, and dual diversity operation of two or more MPC-1000 terminal units.

The external regenerator connectors may be used

for crypto, code conversion, regeneration or speed changing peripherals. The popular Uart and FIFO combinations interface without modification of their input or output circuits.

Field testing indicates an error rate improvement of 10 to 1 over the FM discriminator type TU under normal conditions and up to 3000 to 1 under conditions of multipath distortion, aurora and weak signals at the noise threshold.

Normally supplied for 110 volt, 50 to 400 Hz. operation. 220 volt operation is provided by changing an internal strap. Package size is 17" wide, 3.5" high and 9" deep. Rack mounting adapters are available for standard 19" racks. Price and delivery: \$495.00, FOB South Pasadena, Ca., and 30 days ARO or sooner, depending upon stock.

\*\*\*

## S.A.R.T.G. DX CONTEST

### 1. Test periods:

- I: 0000-0800 GMT Saturday, August 16.
- II: 1600-2400 GMT Saturday, August 16.
- III: 0800-1600 GMT Sunday, August 17.

### 2. Bands:

Use all bands 3.5-28 Mhz. The same station may be worked once on each band for QSO and multiplier credits. Only 2-way RTTY QSO's will count.

### 3. Classes:

- A) Single operator, up to 100W input.
- B) Single operator, over 100W input.
- C) Multi operator, Single transmitter (any power).
- D) SWLS

### 4. Exchange:

RST and QSO number.

### 5. Points:

QSO with own country, five (5) points. Other country in same continent, ten (10) points. Other continent, fifteen (15) points. In USA and Canada each call-district will be considered as a separate country.

### 6. Multiplier:

Each country and each district in W/K and VE/VO. Use the DXCC list only.

### 7. Scoring:

Sum of QSO-points x sum of multipliers.

### 8. SWLS:

Use the same rules for scoring, but based on stations and messages copied.

### 9. Logs:

Mailing deadline is September 18th, 1975. 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 especially regarding Oscar Traffic in future tests. Send logs to: SARTG Contest Manager  
OZZCJ C.J. Jensen  
Meisnersgade 5  
DK-8900 Randers Denmark

### 10. Awards:

To the top stations in each class, in each country, W/K and VE/VO call-district. In areas with sufficient participation also 2nd and 3rd place certificates, to stations showing a reasonable score.

P.S. Remember the SARTG activity contest the last Wednesday in each month (after the Scandinavian RTTY bulletin), at 18.15 GMT. 3.59 Mhz until 19.30 GMT. Exchange RST and name and QTH. Each QSO gives 1 (one) point. QSO with Bulletin Station gives 2 (two) points. Logs to SARTG Contest Manager OZZCJ.

\*\*\*

## The RATTLine RM-200 UART/FIFO Communications Processor-

HOWARD L. NURSE, W6LLO  
665 Maybell Avenue  
PALO ALTO, CALIFORNIA 94306

The RM-200 Communications Processor is a versatile interface system to be used between Teletype terminals and modems. The RM-200:

- Improves the quality of incoming and outgoing RTTY data streams.
- Facilitates the interface of RTTY systems which have different Baud rates, and RTTY components which have different interconnect requirements.
- Adds significantly to operating conveniences.
- Reduces operator fatigue and anxiety.
- Joins the new generation of UART/FIFO processors which is shaping the future of amateur RTTY communications.

The RM-200, shown in the photograph, is the result of more than two years of developmental effort. While many of its functions are similar to those of the UT-2 and UT-4 (1,2), there are many features which have not been included in the UART/FIFO systems which have been presented to date. Since much has been written about specific UART/FIFO circuitry in recent issues,

I have decided to describe the RM-200 from a functional, rather than a detailed design, point-of-view. If there is sufficient interest, I shall follow this article with one discussing the details of the circuitry, much of which is compatible with systems that have already been described.

A Universal Asynchronous Receiver-Transmitter (UART) is at the heart of the RM-200 Communications Processor. To review, a UART is a programmable MOS/LSI device containing a receiver section and a transmitter section used for interfacing an asynchronous serial data channel from a terminal or modem with the parallel data channels from a computer or processor. The receiver section converts a serial word having start, data, and stop bits into parallel data. The transmitter section accepts the parallel data, adds the necessary start and stop bits, and sends the data out as a serial data word.

Once the data has been converted to a parallel format by the UART receiver, a variety of data processing functions is made possible. The data words can be re-timed, stored, decoded, or routed to external equipment for further processing. The RM-200 uses a 3341 First-In-First-Out (FIFO) memory to store the parallel data words presented



by the UART receiver section. Once stored, the Bytes (parallel data words) can be taken from the FIFO asynchronously (at will), which means that data arriving at the input of the UART's receiver section at one rate can be sent to the UART's transmitter section at a different rate. This capability allows the RM-200 to smooth erratic data, such as that coming from those of us who are not precision typists.

A block diagram of one typical RTTY system using the RM-200 is shown in figure 1. Note that the RM-200 is designed to work equally as well with solid state terminal equipment as with mechanical teleprinters. The RM-200 will integrate into either system with no modification to existing equipment. The RM-200 receives data directly from any terminal unit loop output, and provides internal loop supplies to operate Teletype or video terminals.

The following paragraphs describe the features of the RM-200 Communications Processor in detail. The first section describes the functions which the processor will perform, while the second section outlines the various displays which are intended to aid the operator when the system is in use.

#### RM-200 OPERATIONAL MODE

**1. Regeneration:** (NOTE -- the first four modes are common to both the RM-200 and the UT-4). The RM-200 automatically regenerates all incoming and outgoing data streams. The UART continues to decode correctly input data which has bias distortion up to 43 percent. The UART reconstructs the distorted data and sends it back out with insignificant bias distortion. When the RM-200 is in the transmit (XMIT) mode, imperfections in data due to a faulty keyboard will be corrected. When in the receive mode, the RM-200's UART will eliminate bias distortion due to faulty equipment at the transmitting end, se-

lective fading, or slicer distortion due to inaccurate tuning.

**2. Baud Rate Conversion:** Radio amateurs may transmit RTTY using any one of four Baud rates, with 45.45 Baud the most popular. Unless gear boxes or electronic speed converters are used, most amateurs are limited to using one speed. The RM-200, with its crystal controlled Baud rate generator (3), allows a local machine which is limited to one speed to communicate with machines running at different speeds. The local machine could be geared for 74.2 Baud if operation at all of the allowed Baud rates were desired. There is no reason, however, why the local machine cannot be operated at 45.45 Baud and copy transmissions made at higher Baud rates, so long as the average typing rate does not exceed 60 WPM. I have found that most manually typed transmissions can be copied quite readily in this way, even if the other station is using 74.2 Baud. Just watch that FIFO fill up on a tape transmission, however.

In addition to the obvious advantages of electronic speed conversion, there are other advantages which may not be apparent at first. One problem when typing on any electro-mechanical machine is keyboard lockout if you try to type a new character while the previous character is being sent. Lockout, which fights your normal typing rhythm is less annoying with an electronic keyboard, but is still present. As the machine speed is increased, the problem is less severe, since the machine clears more rapidly. The RM-200 FIFO memory and speed converter allow the machine to be operated at a higher rate than the Baud rate being used on the communications channel, and thereby improve typing response while retaining a low Baud rate.

A second advantage afforded by running the local machine at a higher Baud

rate than that being used on the channel is that incoming traffic can be smoothed, which in turn makes machine noise much more tolerable.

**3. SLO SPEED:** The SLO SPEED mode of the RM-200 can be used in the receive and transmit modes, at the option of the operator, to regulate the output rate of the regenerated data. When transmitting, the SLO SPEED control can be adjusted to a rate slightly below the average typing rate of the operator. The FIFO memory is used to smooth the output data rate to synthesize perfect typing rhythm. The same mode can be used when receiving to smooth other operators' typing to make listening much less tiring. A meter (MEMORY UTILIZATION) and indicator lights on the RM-200's front panel allows you to adjust the SLO SPEED control to the correct rate to keep the memory partially filled. This control allows the apparent typing rate to be adjusted from approximately one character per second to full machine speed. As the SLO SPEED control is advanced, machine speed will automatically be achieved, and further advancement of the control will have no effect. If the outgoing Baud rate is increased, the SLO SPEED control range is automatically increased to allow a faster typing rate. The SLO SPEED mode can be completely disabled in either transmit or receive modes by front panel switches.

**4. DIDDLE:** The DIDDLE (DDL) mode, patterned after the one in use at W6FFC for several years, is an optional function that can be selected in the receive or transmit mode by front panel switches. The DIDDLE mode automatically inserts LTRS or FIGS characters into the data stream when the FIFO memory is empty. Insertion of a dummy character is necessary if you wish to keep the output data rate constant even though there is a pause in your typing, or if you wish to synthesize true "machine-speed" typing.

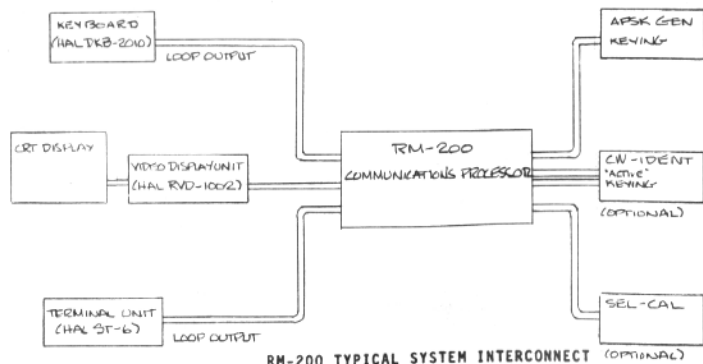
The RM-200 remembers the last occurrence of a LTRS or FIGS character, and continues sending that character until a new Byte is detected in the FIFO. If the SLO SPEED function is disabled, selection of the DIDDLE mode will allow continuous machine speed data to be sent. One advantage of this mode is ATC/DTC action enhancement in the receiving station's TU. ATC/DTC depends on MARK/SPACE reversals for establishing thresholds. With a higher rate of transitions, the machine speed DIDDLE mode will provide better copy. It has been found in on-the-air tests

that automatic DIDDLE insertion at machine speed can be annoying to the operator at the other end if excessive LTRS or FIGS characters are transmitted. ANTI-DIDDLE, described in the next section, is included in the RM-200 to remove excessive non-information characters while receiving. However, if the other station does not have this capability, it is usually best to leave the DIDDLE mode reserved for use when the SLO SPEED is employed, as a kind of reserve tank.

**5. ANTI-DIDDLE:** Most operators habitually fill gaps in their typing with LTRS or FIGS characters. The only time these characters are used by the receiving station is when going from one case to the other. The only other time a LTRS or FIGS character is useful is when the printer is sent to the wrong case by noise on the communications channel. Downshift-on-space can be used in the receiving station's printer to significantly reduce hits due to incorrect case, but not all machines are equipped with this function. In addition to aiding the ATC/DTC action, DIDDLE can also contribute to lessening inadvertent case reversals. Since there is no reason to send these extra LTRS or FIGS characters to the printer, the ANTI-DIDDLE mode can be used to remove all but the significant case reversals. A further advantage to ANTI-DIDDLE is more efficient usage of the FIFO memory, since there is no reason to store redundant characters.

**6. HOLD:** When the HOLD mode is enabled, all output functions of the RM-200 are inhibited. This mode can be used to store data in the FIFO memory for later transmission or decoding. It allows you to pretype a message, or to start typing before keying the transmitter. The HOLD mode can be enabled electronically during CW identification to allow you to continue typing just as if your transmission had not been interrupted. If the local machine is geared for a faster speed than is being used on the communications channel, and the RM-200 is placed in the HOLD mode when in receive, it will empty at machine speed when the HOLD is released. This feature, which allows the RM-200 to "catch-up" with on-going traffic, would be useful in an advanced autostart processor where several valid characters were decoded before allowing the machine to print. If the signal turned out to be nonexistent, the RM-200 memory could be dumped automatically.

**7. DUMP:** The contents of the FIFO memory can be erased either electronically or by the operator when the DUMP



RM-200 TYPICAL SYSTEM INTERCONNECT



mode is enabled. The DUMP mode clears the memories, resets all status indicators, and clears the UART. The DUMP mode is automatically initiated when power is first applied to the system, or if power is momentarily interrupted.

8. **INTERRUPT:** The INTERRUPT mode allows data from another source to be entered into the data stream. INTERRUPT data may come from a WRU, a time/date generator, or even a microprocessor. The completely automatic INTERRUPT mode receives its instructions and data through a rear panel connector on the RM-200. When the RM-200 is in the INTERRUPT mode, normal typing can continue as in the HOLD mode. The FIFO memory will temporarily store local data, and begin to release it once the INTERRUPT has ended.

9. **LOOP:** A message stored in the FIFO memory when in the HOLD mode can be looped back on itself and played back continuously. This mode is useful when calling CQ, sending RY's, or chasing foxes.

10. **5/8 BIT SELECT:** The RM-200 logic is compatible with either 5- (modified Baudot) or 8- (ASCII) level codes. The RM-200 will not be outdated by regulation changes which may allow the ASCII code to be used on the amateur bands someday in the future. 110 Baud is incorporated in the RM-200 Baud rate generator, and can be selected by a front panel switch. When 110 Baud is selected, the system is switched to 8-level code automatically. If you should ever wish to use 8-level code at a lower Baud rate, a switch on the rear panel can be used to place the system in the 8-level mode.

11. **INTERFACE PROGRAMMING:** It is possible to use the RM-200 in a variety of systems, all of which potentially employ different interconnect standards. A patch panel is located in the RM-200 to facilitate changing to different equipment. Four constant-current loop supplies (two 20 ma and two 60 ma) are available through the patch panel to connect to TU, keyboards, or terminals. If a high voltage loop is required, a high voltage keying transistor is located in the RM-200 so that the loop supply form the TU can be used. Use of the TU high voltage loop supply requires no modification to the TU itself, but may require that a special cable be used between the two units. Once the patch panel is wired for a particular system, it can be left alone. RS-232 and open-collector outputs are available on the rear panel of the RM-200 for operating AFSK or FSK generators.

## RM-200 DISPLAYS

1. **MEMORY UTILIZATION:** By glancing at the MEMORY UTILIZATION meter, you can instantly tell approximately how much information is stored in the FIFO memory. The meter, which is calibrated from 0 to 100 percent, is adaptable to any depth FIFO, from the present 64 Bytes up to 256 Bytes.

2. **MEMORY EMPTY:** The MEMORY EMPTY indicator light provides an absolute indication of when the FIFO memory is empty. This indication is increasingly useful when the depth of the FIFO is increased to the point where a change of one Byte will cause insignificant meter movement.

3. **MEMORY FULL:** The MEMORY FULL indicator warns the operator that no more information may be entered into the FIFO memory. The RM-200 also allows the printer keyboard to be split from the typing unit. When the FIFO memory fills, the output from the keyboard is inhibited. If you are typing too fast, and fill the memory, the last character on the page or screen is the last character entered into the memory. Because of the keyboard inhibit, it is less important for the operator to constantly monitor the MEMORY UTILIZATION meter while transmitting.

4. **IN/OUT BAUD:** A three digit seven-segment LED display tells the operator what Baud rates has been selected. If the RM-200 is located some distance from the printer, the IN/OUT BAUD indicator makes it much easier to determine the complete status of the system.

5. **INPUT BYTE AND OUTPUT BYTE:** By knowing how to interpret what is being displayed on the two rows of BYTE lights, the operator can determine exactly what is happening inside the RM-200. If the system is repeating exactly what is being sent to it at the same time, both rows of eight LED lights show identical characters. When an LED is off, that particular bit is a MARK, while when the light is on, the bit is a SPACE. If you know the code by heart it is possible to copy what is being sent just by watching the lights. If there is a delay between the RM-200 input and output, the two rows of lights will be different. With five-level code, the last three lights in each row will normally be off. If DIDDLE characters are being injected into the output stream, the last three bit indicators will be off until a non-DIDDLE character is sent. When eight-level code is being used, all eight lights in each row respond to the input and output characters.

6. **REMOTE INDICATORS:** Provisions have been made through the rear panel connector on the RM-200 for the MEMORY UTILIZATION and FULL/EMPTY indicators to be located next to the printer/keyboard. A small head containing the LED indicators and a one milliamp meter movement can be attached adjacent to the keyboard so that the respective functions are easier to monitor.

## CONCLUSION

## AFSK KEYING CIRCUIT

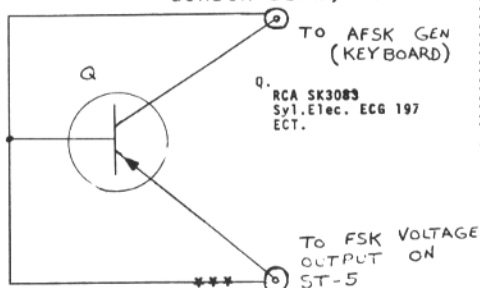
Some readers may be interested in a very simply AFSK keying circuit which has proven successful here at my shack.

I was in need for some way of keying my AFSK generator in connection with my ST-5 TU, and my efforts to use a reed relay was fruitless.

As you see I take the plus-minus voltage available the TU and feed into a switching type of transistor. Works fine.

The type shown RCA SK 3083 was in my junk box but I am certain any similar type would also work.

GORDON BEAN, K8MRS



I have presented a functional overview of the RM-200 Communications Processor in this article. It is hoped that some of the features I have described will serve as inspiration for further work with similar systems in the future -- your imagination is the only limit.

## FOOTNOTES

- 1,3 Hoff, February 1975 RTTY Journal  
2 Hoff, March 1975 RTTY Journal

\*\*\*\*\*

## Results-Flash DX Contest.

1) W3EKT	17,753.976	28) VK3KF	315.510
2) K4GMH	14,798.152	29) SM6ASD	279.888
3) WA3JTC/ZP5	6,348.028	30) W4JNY	270.900
4) I8AA	6,299.930	31) SM5FUG	264.132
5) I1YTL	5,343.458	32) HB9HK	253.440
6) W3CRG	4,798.080	33) PA0RZ	176.400
7) I6NO	4,480.820	34) VE3BMP	170.880
8) DL0TD	2,990.563	35) WA0PFP	135.040
9) I5WT	2,906.171	36) SM0OS	125.664
10) K6WZ	2,408.470	37) I1PXC	106.400
11) HA5KBM	2,307.600	38) EU VEF	99.900
12) CE3MA	2,189.274	39) LA21I	85.680
13) DL1VR	2,052.772	40) W2DUS	72.956
14) K4GJW	1,659.456	41) DL8QP	59.514
15) K7BV	1,589.625	42) PY2DCB	55.080
16) G3ZWW	1,224.128	43) ON6HF	48.048
17) F6ALL	1,141.140	44) GW3IGG	31.668
18) XE1AFU	1,080.660	45) CE3EX	31.296
19) IV0ZAN	732.540	46) PY2CYK	29.835
20) HB9AVK	667.950	47) I2MHH	28.980
21) W0HAH	535.809	48) VK3RY	17.280
22) OK3QB/JT	425.115	49) K1YGF	10.080
23) SL5AR	416.826	50) DK2XV	9.240
24) OK3QBFS	412.177	51) SM6EZD	8.364
25) OK3QMP	403.515	52) W8CAT	7.920
26) SM5BKA	363.324	53) W6AEE	7.176
27) W7BCT	354.240	54) VO1EE	6.720

## S W L SCORE

1) PAUL MENADIER	4,944.960
2) JOHN WHYMARK BRS35211	2,513.178
3) HORST BALLENGERGER	2,453.724
4) ROBERTO GIARNELLO I3-13018	1,947.445
5) WOLFGANG GELLER DL-SWL	1,531.309
6) TOSOLINI MARIO I3-14258	1,287.230
7) ALBERTO MARCHESINI I4-14707	974.944

\*\*\*

## New! Beginners RTTY Handbook.

In publishing the RTTY JOURNAL for a number of years we feel we have a good idea of what should be in a beginners handbook. We have tried to put as much of it as possible in this handbook.

A complete section of 18 parts on theory and application of RTTY with emphasis on the application. Simple wiring for the 15-19 teletype machines. Modern AFSK oscillator. PLL Demodulator, ST-5 Demodulator. Auto-start for the ST-5. Improved scope display for demodulators. 3 band xtal controlled transmitter and receiver for \$100. Operating procedures on RTTY. How to make your own picture tapes on RTTY. Awards for RTTY operations. Sources of supply.

Much of the material has been published in the Journal but has been edited to bring it up to date and is all in one place.

If you are new to RTTY, want a good reference on some of the fundamentals or an excellent book to give a friend just starting. We think you will like it. In fact if you are not completely satisfied, we will gladly refund your money. \$2.50 PP.

# AFSK Generator

MARTIN GEISLER, WA6TIC  
11300 Hartland St.  
NORTH HOLLYWOOD, CA. 91605

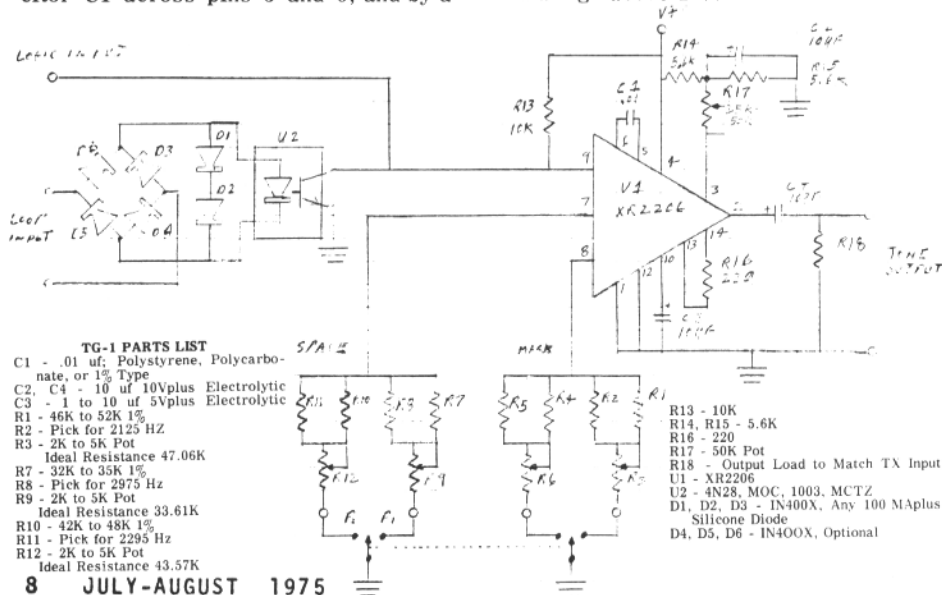
**FEATURES:**  
NO XTALS, WITH THE STABILITY OF ONE.  
VERY LOW SINEWAVE DISTORTION. LESS THAN 1%.  
EXCELLENT TEMPERATURE STABILITY (20PPM/C).  
INSENSITIVE TO SUPPLY VOLTAGE CHANGE. NO NEED FOR REGULATION (12 to 20 Volts 1 Hz Change)  
INDEPENDENT MARK AND SPACE ADJUSTMENTS:  
HIGH OUTPUT LEVEL. 3 VOLTS INTO 600 OHMS.  
SIMPLE ADJUSTMENTS.  
INVERTED AND UPRIGHT OPERATION POSSIBLE.

The one IC that will do all this is made by EXAR (XR-2206) and was designed with FSK generation in mind. It has an Internal Current Switch that transfers the oscillator current to any one of the two external timing resistors to produce two discreet frequencies. The AFSK generator circuit shown in Fig. 1, is layed out so it is possible to operate with two totally independent tone frequency pairs, by the use of an external switch. The frequency of oscillation is determined by the external timing capacitor C1 across pins 5 and 6, and by a

timing resistor connected to either pin 7 or pin 8 to ground. The frequency is given as  $F$  equals  $1/RC$  Hz. The range of the resistor should be between 4k and 200K Ohms. It will operate with a supply voltage of 10 to 26 volts. The output amplitude is inversely proportional to the resistance of R17, the Output Gain Control. Thus, for example, R17 equals 50K Ohms would produce approximately plus 3 V sinusoidal output amplitude, and 25K pot would have a maximum of plus 1.5 Volt output. C1 is the timing capacitor and should be the best quality capacitor you can obtain. The frequency stability of the oscillator, with respect to temperature, is dependent on the stability of the capacitor and resistors.

The resistors R1, R4, R7, R10 should be a 1% type and to solve the problem of obtaining a large selection of resistors to choose from, a 5% to 10% carbon resistor (R2, R4, R8, R11) may be paralleled to trim the frequency so it will reach the range of the adjustment pot. The true resistance shown in the parts list is based on an exact .01 uf capacitor.

The loop input through the use of a bridge and opto-isolator will accommodate a series loop of any polarity that is between 20 and 100 MA. The logic input can be driven by most logic families that have a low less than 1.2 V and a high above 2 V.



# A TTY DIGITAL CLOCK

## PART 2

GEORGES J.M. WERTS, ON5WG  
87, rue P. Lemarchand  
B-4801 STEMBERT, BELGIUM

### 4. CONSTRUCTION

This being a prototype, the clock has been wired on an universal P.C. board to easily permit the modifications during the final tune up. Two another small universal P.C. boards are used for the diode matrix and for the display. All the clock with its power supplies is housed in a 260x85x200 mm box. The display's power supply is connected before the plus 5 volts regulator (point D) to prevent too much consumption on the plus 5 volts line. The voltage at this point D is approximately 9.5 volts (in load) so the 560 ohms resistors give a current of 17 mA per segment. L1 and L2 are 6v. 200mA lamps located in the PRINT and CLEAR push-buttons, they permit a quick discharge of the 22,000uF when we are turning off the clock. The 12 volts transformer must have a screen-winding and this winding must be grounded. Without this precaution, the MM5311 gives minutes which are equal to about 40 seconds when the 200w. transmitter is on the air. All parts of this design are easily available everywhere. For the European readers, the MM5311 is not often available in Europe and its price is much more expensive than in the U.S.A. Personally, I bought mine directly from Poly Paks. Don't buy the popular MM5314, it doesn't work for this application because it hasn't BCD outputs. Don't forget to put two 0.15 uF ceramic capacitors on the plus 5 volts regulator (see Ref. 7).

### 5. FUTURE POSSIBILITIES

Without going up to the full automatic RTTY station (see Ref. 8), this clock is the first step to the ELECTRONIC RTTY CONTEST MESSAGE GENERATOR. It is now in gestation and many possibilities are offered to achieve it. I am looking for the most attractive solution and hope to describe it in a few months.

### 6. ACKNOWLEDGEMENTS

I would like to acknowledge the help,

encouragement and interest shown by my friends SWL Claude Bertoni and Jacques Debarge ON6HF during the development of this clock. Many thanks also to Claude for the loan of his ASAHI PENTAX camera.

### SCHEMATIC ON NEXT PAGE

### 7. BIBLIOGRAPHY

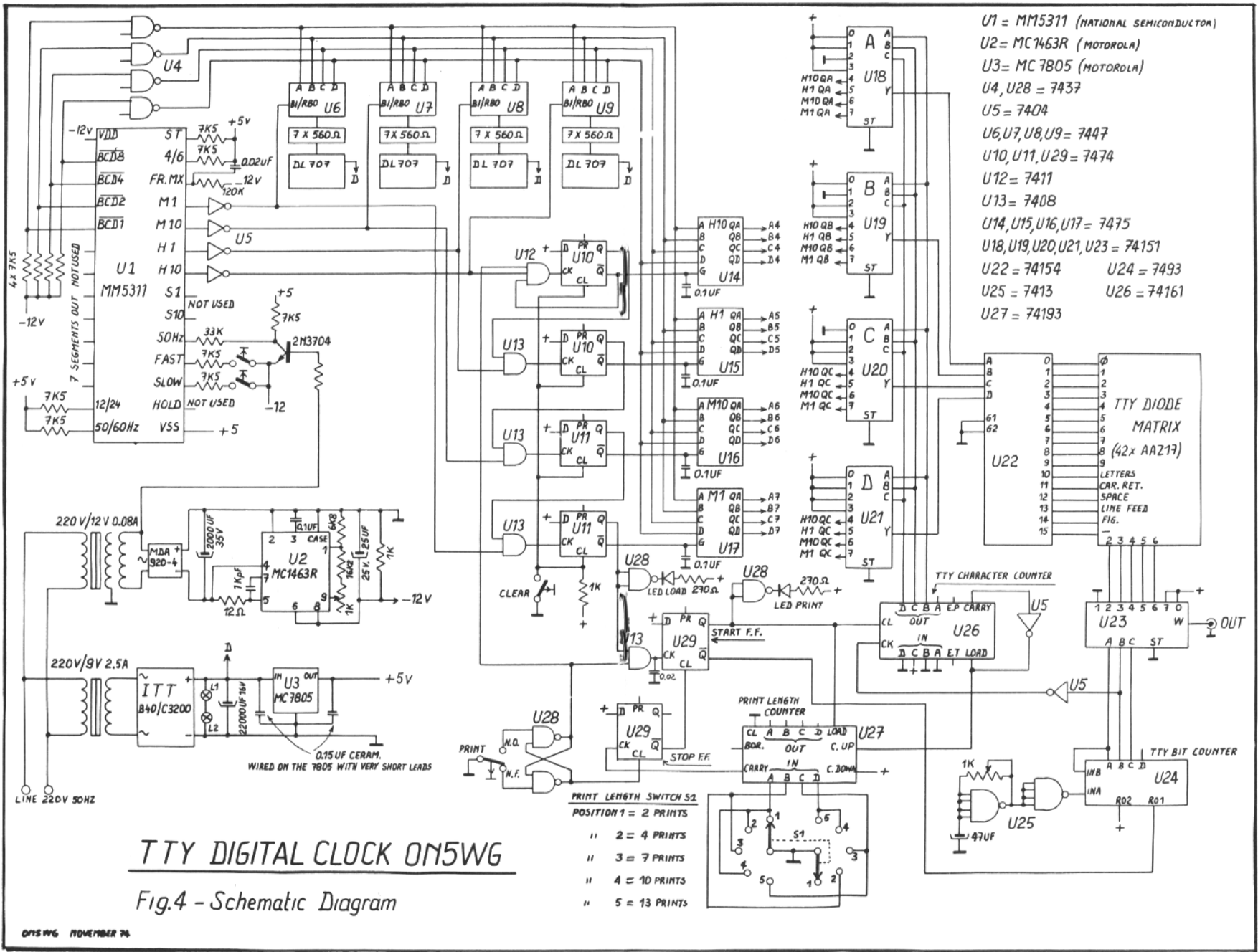
- Ref. 1 MM4311/5311 series Digital Clock  
Data Sheets NATIONAL SEMI-CONDUCTOR CORP. 1972  
Ref. 2 Solid state loop keyer for TTL and TTL2 by K3KWX  
RTTY JOURNAL March 1974  
Ref. 3 A TTL message generator for RTTY and CW by K4FUP and W4VYS  
QST November 1973  
Ref. 4 A character generator for ATV by WA4JNA  
QST July 1974  
Ref. 5 RTTY message generator by W8KCQ  
HAM RADIO February 1974  
Ref. 6 The TTL DATA BOOK for Design Engineers  
TEXAS INSTRUMENTS CC411  
Ref. 7 Voltage regulators by WA0DGW  
HAM RADIO September 1974 (page 73)  
Ref. 8 S.O.C.A.R.S. by G3ZCZ/W3  
RTTY JOURNAL december 1972, january 1973 and february 1973

\*\*\*

### MODIFICATION ---

A note from the author, WA0TJR of the Modern AFSK Oscillator "RTTY JOURNAL March 74 and the "Beginners RTTY Handbook" states that some problems have developed from inconsistent electroic condensers, in this case the 8yf condenser at the output of pin 4 on the NE566. Experiment has shown it is not needed at all, just omit from the circuit.

\*\*\*



- U1 = MM5311 (NATIONAL SEMICONDUCTOR)
- U2 = MC7463R (MOTOROLA)
- U3 = MC7805 (MOTOROLA)
- U4, U28 = 7437
- U5 = 7404
- U6, U7, U8, U9 = 7447
- U10, U11, U29 = 7474
- U12 = 7411
- U13 = 7408
- U14, U15, U16, U17 = 7475
- U18, U19, U20, U21, U23 = 74151
- U22 = 74154      U24 = 7493
- U25 = 7413      U26 = 74161
- U27 = 74193

## TTY DIGITAL CLOCK ON5WG

Fig.4 - Schematic Diagram

- PRINT LENGTH SWITCH S1
- POSITION 1 = 2 PRINTS
  - " 2 = 4 PRINTS
  - " 3 = 7 PRINTS
  - " 4 = 10 PRINTS
  - " 5 = 13 PRINTS

# VHF RTTY NEWS

RON GUENTZLER, W8BBB Editor  
212 GRANDVIEW Blvd.  
Ada, Ohio 45810



This month we have five separate pieces of VHF RTTY information. We hope that these will do some good toward encouraging operators to get on the air and that they will stimulate more information from other parts of the country. The information is from St. Louis, Stamford, CT., Milwaukee, WI., St. Petersburg, FL., and Los Angeles.

John Roussin, K0MJZ, St. Louis writes: "Wonder how many RTTY repeaters are operating in the U.S. and what frequencies they use - two meters, that is. I am a member of the St. Louis Amateur Teleprinter Society (SLATS). We have about 30 members at present and are in the process of building up a RTTY repeater in the St. Louis area."

WA1DQL gave us the following information at Dayton: "Teletype Repeater, Stamford, CT., WR1ABR, sponsored by the Stamford ARA. 146.055 MHz in, 146.655 MHz out. Carrier access, 850 Hz shift, standard tones (2125 Mark, 2975 Space). 12 watts output. Used in the area from Westport to New York City including Long Island. Currently about 12 RTTY operators are using the repeater. Shortly, a second repeater will be added using an input of 147.055 MHz."

W9CUW also gave us some information, verbally, at Dayton: "RTTY repeater in Milwaukee - owned by K9HXA - call WR9ADU. 146.100 MHz in, 146.700 MHz out. 170 Hz shift, 2125 Hz Mark, 2295 Hz Space. Auto CW ID. Under the RTTY it will send four Hs or four Ls to indicate whether the received carrier frequency is high or low, respectively. It will not handle voice. It is necessary to send four RTTs to access. It has a 6 minute time out. At present, it is used by W9TQ, W9ZPV, W9OOW, W9BGL, WB9EEJ, W9CUW, and K9HXA."

WA4CTM wrote the following: "RTTY has gotten a slow start here in Pinellas County, the west coast of Florida (St. Petersburg). For a long time there were only one or two stations on VHF RTTY, and consequently they spent most of their time on HF. Now we have six active on VHF and a few more actively looking for

machines. The major activity is centered on 51 MHz, with most of us working and monitoring 50.325 MHz for DX. We are using 850 Hz shift AFSK on AM. Most are using homebuilt tube-type TUs. Two of us have ST-6s and are avid promoters of setting up and autostart net, probably on 50.325 MHz. Some have plans for converting everyone to six FM, and having autostart there, but with many holdouts, we don't want to split any group in its infancy. There is no two meter RTTY activity that I know of. In my opinion, nearly everyone takes longer to get started down here in the hot climate."

Steve Phillips, WA6TVA, 272 Villanova Rd., Costa Mesa, CA 92626, has some interesting information and a good technical problem: "The WR6ACA repeater (Los Angeles/Orange/Riverside/San Bernardino/Ventura Counties area) has been in operation since 1971 on the pair 146.100 MHz in, 146.700 MHz out (formerly WA6TIC). This repeater is truly RTTY only because it has a modified ST-5 connected to the receiver; the ST-5 drives a standard current loop to key a tone keyer at the transmitter. There is no way at all that voice, etc., can make it thru this repeater. The ST-5 has autostart, and the repeater only comes on when there is a RTTY signal on the frequency."

"The shaft is 850 Hz at present, but investigation into the merits and disadvantages of going to 170 Hz shift are underway at present due to the co-channel interference problems that have started to appear in the Los Angeles area. This area is completely saturated with repeaters, and new ones are even using the 15 kHz splits. A little investigation into the process of FM modification using the standard tones, shows that the 2975 Hz tone causes significant sideband energy as far out as the third sideband pair (approx. 9 kHz). This is for a nominal deviation of only 4.5 kHz, transmitter power of 20 watts into a 6 dB gain antenna. The total channel bandwidth of 18 kHz in this case is far in excess of the acceptable voice bandwidth (considered 13 kHz in

this area). For the same stated conditions, the effective bandwidth of the 2295 Hz tone is only 13.77 kHz. (A third of a watt is considered to be enough to cause interference). I would be interested in hearing from other groups who have run across the "broad" RTTY FM spectrum problem and how they have dealt with it.

"To continue with the repeater, there is a club called the Southern Counties Amateur Teleprinter Society which meets each month at the home of various repeater users. New officers of the club are: Steve, WA6TVA, president (me), Frank, WA6ZCQ, vice president, Bill, W6NSW, secretary/treasurer, Don, WA6PJR, public relations, and Fred, WB6EIE, bulletin editor. Any person interested in RTTY is invited to attend. They may write to me or any of the other officers for more information and where the meetings are to be held (or monitor the repeater for the information). There are over 70 users of record of this repeater covering the 5 county area. The repeater is located North of Los Angeles and West of the San Fernando Valley. It is owned by Martin, WA6TIC.

"The present equipment includes the RTTY equipment already mentioned as well as a Motorola Sensicon G strip receiver and a Motorola TX strip of the same vintage running 20 watts. There is a new solid-state TX/RX pair being modified to replace the present equipment."

"I hope this will give you enough information to help out. I am sure that many more fellows will come crawling out of the woodwork (like me) with information for your column. I would particularly like to see a discussion of the FM sideband generation problem that I mentioned. This is a problem that is going to plague all of us at some time as the band becomes saturated more and more across the country with repeaters. The closest ones to the WR6ACA repeater are still 30 kHz away, but there are times when one of our users with a poorly adjusted TX will get into the input of one of the adjacent repeaters and either lock it up or at least cause noticeable interference.

Thank you, Steve, et al., for the information. This is what we like to have. How about some more information? 73 ES CUL RG.

\*\*\*\*\*

So I made a computer run on the combinations of dividers that would give the clock frequencies for the UART from the 3579.545KHZ color burst crystal. As luck would have it two of the combinations that gave 60 WPM and 100WPM speeds had three dividers in common and gave 0.20% and 0.28% error respectively.

The circuit below is the result using a 7404 for the crystal oscillator and 74193's as programmable dividers.

If you are interested in other baud rates, a list of divider ratios for all the popular ones is available if you will send me a SASE and an extra stamp to cover the cost of the copy.

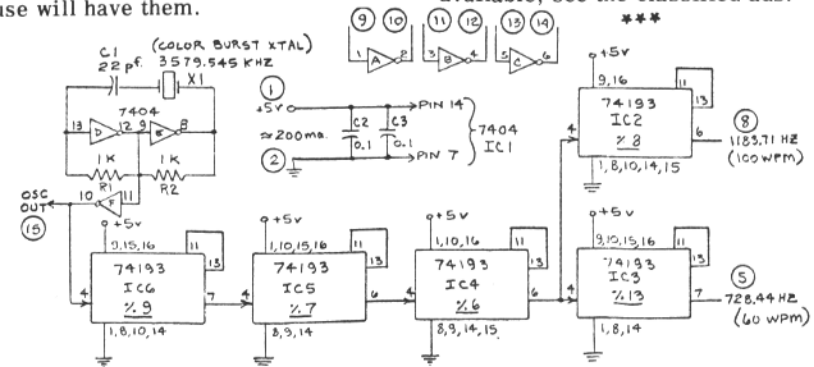
A circuit board and parts kit is available, see the classified ads.

## Color Burst Xtal UART Clock

LARRY WALDRON, WA4RZY  
131 University Ave.  
LEXINGTON, KY, 40503

After getting a UART setup working it became obvious a crystal clock would be a big improvement. Remembering some of the long waits I have had in buying custom ground crystals, I decided there must be a better way.

Then I remembered seeing color burst crystals for \$2.38 at the local parts house and that seemed a likely alternative since just about any parts house will have them.





# RTTY-DX

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



**Hello there . . .**

With the Summer editions stretched out as they are most of what you read here will be "old hat" by the time it arrives. Anyway, I for one have the distinct feeling that it all happened ages ago.

The WAE Contest came off on time of course with conditions somewhat below par and with the higher frequencies hardly worth having an effort over. On 40 meters one way skip seemed to be in force with stateside stations copying the Europeans fairly well but not the other way around. That time of the year can also cause some severe static (QRN) conditions in some areas on 80 meters making the print difficult to copy. I guess what it all means is that 20 was the BIG band again. Some of the more exotic calls active in the Contest were: KL7GKY, HM1ID, EA8FE, 4X4MR, 4U1ITU, K42TS, DUIPOL, UK2GAX, CT1 CT1EQ, ISQHMA, 5U7BA, YU3EM, and TF3IRA.

For those not away on Summer holiday August brings the SARTG Contest and an opportunity to experience conditions and activity at this time of the year. Rules are same as last year except that DXCC rules apply for country count. Full information can be found on other pages of this issue.

We would like to make mention of a very excellent and high quality publication put out by the SARTG on a quarterly basis called "SARTG News". In addition to its coverage of RTTY activities in each of the Scandinavian countries it contains what appears to be excellent technical articles and complete Contest and DK information, also a comprehensive section on the OSCAR activities. A knowledge of Nordic language is a prerequisite for full comprehension and those interested can receive further information from. . .SARTG

Box 25

S - 431 21 Molndal, Sweden

It is with extreme pride and pleasure that we announce the 6th World RTTY Champion, Ed Bruns, W3EKT. Ed is fairly new to RTTY but an avid DX'er

14 JULY-AUGUST 1975

## HONOR ROLL - 100 DXCC

Confirmed		Confirmed	
ON4BX	143	15KG	112
ON4CK	138	DK3CU	112
W3KV	137	JA1ACB	112
W5QCH	128	G6JF	110
WA3IKK	121	W8CQ	107
W3DJZ	115	W4YG	100
W2LFL	114	K8YEK	100
I5ROL	114	I5WT	100
W5EUN	112		

## Over 50 Countries Confirmed

1. W4CQI	103/95	16. KH6AG	80/63
2. K6WZ	99/93	17. K4VDM	67/63
3. W1GKJ	97/91	18. EI5BH	76/62
4. DL8VX	93/85	19. ZL2ALW	63/58
5. W4EGY	87/84	20. SM0OY	67/57
6. W8JIN	96/82	21. K6YUI	64/55
7. DJ8BT	90/82	22. W0MT	60/55
8. OK1MP	85/80	23. I8AA	69/53
9. W3EKT	87/77	24. W0NP	58/53
10. W2PLQ	79/74	25. JH1ISF	61/52
11. K3SWZ	75/73	26. SM5BO	60/52
12. F5JA	82/71	27. W0HAH	62/51
13. G8LT	73/69	28. HB9AKA	62/51
14. K4YZV	76/66	29. OZ4FF	67/50
15. CE3EK	76/65	30. W5TZB	54/50

## Less Than 50 Countries Confirmed

1. ON5WG	57/49	11. DL0AK	49/28
2. HB9ACQ	61/48	12. PA0WDW	47/28
3. W7BCT	55/46	13. WA0TAS	42/28
4. W8CAT	48/46	14. WB4MAV	52/27
5. HB9HK	56/42	15. W4ZCM	41/25
6. G3LDI	58/39	16. PY6HL	33/23
7. VK6PG	53/38	17. DK1NB	67/22
8. ON5CZ	60/31	18. W4ZLH	30/15
9. SM6EZZ	35/30	19. W0LZT	33/14
10. DK4ZF	61/29		

The next listing of the Honor Roll will be published in the December issue.

\*\*\*\*\*

and Contest participant, which is what the World Championship is all about. The winner is picked by his best performance in 4 out of the 6 RTTY Contests that are sponsored each year by the various RTTY Groups and Societies. This is the first time that the Award has come to this Continent and we all of course ex-

tend to Ed our heartiest congratulations for a job well done.

In spite of generally poor conditions RTTY-DX has had its good moments when the bands are open. During early May CO7RR showed up for a brief fling at the keyboard and then quietly faded away again. HL9TG caused quite a bit of excitement by booming into these parts early one Sunday morning, he is . . .

Gary E. Kohtala  
 c/o U.S. Armed Forces Korea  
 OAC OFS, J-6  
 APO San Francisco Ca. 96301 or  
 via his QSL manager (now get this)  
 Gerald Ford

RFD 2 Box 2212 Spanaway, Wa. 98387  
 More activity from the same area is by HM1ID who is . . .

Joo Ho Kim  
 Sung Dong Gu  
 Whayang Dong 150-108 Seoul, Korea

Also from Asia Charly, OE5CA/YK was active from Damascus for a short time. QSL's go via the OE bureau or via OE5REB but we have not been able to obtain QSL info on the latter.

VS6EK shows on 20 meters from time to time but has TU troubles and hopes to be more active when they are cleared up.

OD5HC has a machine and TU and was scheduled for some early June activity. You fortunate ones can send your card to . . . Pierre Rizk

P.O. Box 3288 Beirut, Lebanon

9H1CE also has a machine and TU and hopefully is active by the time you read it here . . .

Bert Padovani  
 59 St. Vincent St. #3 Sliema, Malta

Jeff, G3YDR, who was due to fire up from Malta was sidetracked to Zaire (9Q5) to do repair work on some RTTY links in that country so no word about his future plans at this time. Licensing in Zaire is just about impossible at this time.

On the African Continent, 5Z40T is just about due if he can get a few remaining problems ironed out including the delivery of another machine. July is the present target date.

Taffy, ZE1CE, has been on an extended trip to England and met many of the G men like G6JF and G4CTQ, and was present at the BARTG Convention in Meopham in May.

TU2CI, Alain, was active from Abidjan in May and is the only possibility from Ivory Coast at present.

John, 5T5LO, was home in France signing his F5LO call for several weeks and is now in the Republic of China pursuing his activities as a mining engineer.

It would be fabulous indeed if John could put China on RTTY. We will have to wait and see.

Closer to home there is activity from a new station in Guadeloupe. Charles FG7AO has been quite active and will soon be joined by FG7AN, and FG7AQ, all through the efforts of Jean, FG7XT. Jean also promises RTTY activity on a permanent basis from St. Pierre, FP8, in the near future. In addition Jean says that all Awards issued by the French Society, R.E.F. will be endorsed for RTTY where applicable.

Much welcomed activity from Puerty Rico is being provided by KP4USN, club station at a Navy facility there. Most of the operating is done by Steve Reed, KP4EAI, and son of a Naval Captain stationed at the base. Steve is 16 years old, but handles the keyboard like a pro. QSL to . . . Amateur Radio KP4USN

USNSGA Box 666  
 FPO New York 09555

The big event as this is being written is the first RTTY activity to come from Bulgaria. LZ1KAB became active on 31 May and many stations in Europe have him in the log at this time. He was extremely weak with a very narrow shift at his first showing but it is very likely that he has been worked in other continents by this time. QSL info is . . .

Central Radio Club of Bulgaria  
 ul Gurko 76-A Sofia, Bulgaria

Soon to follow should be activity from LZ1KDP, also a club station and being activated through the efforts of Uli, DK-3CU.

To keep you cool these hot Summer evenings, look from signals from:

FR7AB, SV0TOL, UK2BAB, UK3-DBG, VP1MT, OH6JG, GI4AHP, YZ3EM, & YZ2RWR, HK3DJB, DM2AYO & DM2-BRN, LU1CAB, PI1RTD, PA6AA, YA1Z-WA/11, IS0PZR, and MIN.

Since we are fast running out of space we will close by wishing you all a pleasant Summer or Winter, as the case may be, and see you in September.

Especially thanking, W2LFL, W3DJZ, W3EKT, W4CQI, K4GMH, K6WZ, DK3CU, FG7XT, JA1ACB, ON4BX, and many more via the keyboard.

73 de John

## DX WORLD CHAMPIONS

We received notice from the BARTG, in charge of the WORLD RTTY CHAMPIONSHIP for the past year that the three top winners are:

- 1st - W3EKT -- 110 pts.
- 2nd - K4GMH -- 99 pts.
- 3rd - I6NO -- 97 pts.

This is the first time North American stations have won this award and taking first and second is indeed a compliment to the winners. (see DX column)

JULY-AUGUST 1975 15





We have always started our comments on the Dayton Hamfest with "Bigger and Better". This was true this year, over 10,000 registered, but we wonder how long this can continue, this year some effects of "bigness" began to show up. Parking was spread over at least a mile of territory on Saturday, housing was difficult but well handled by the committee, the flea market took several days to get around, increased room in the exhibit hall allowed the crowd to move even if they couldn't get close to the popular booths. The Hamvention groups do a superb job and with past experience I am sure will come up with some answers to alleviate some of the problems. After all it is hard to criticize success and no question that Dayton is in a class by itself.

As for the RTTY JOURNAL Hospitality room, it has grown from a few friends and 3 bottles of 9 years ago to over 200 signed in guests and 36 qts. of Kool Ade. Thanks to generous donations from HAL COMMUNICATIONS and ART, XEILL we never even ran low. However the gatherings themselves to us was just a kaleidoscope of faces and names. We regret that we don't have more time to chat with the many attending.

We are pleased to report that Paco, XE1WU on his third trip to Dayton won the grand prize. A Heath SB104. The photos on another page are courtesy of Wilson Baird, WMBB. See you next year . . .

From Kermit Slob, W9BT, we understand that a considerable amount of 15 and 28 Teletype parts are available to hams from Norm McCaskill, Carterphone Corp., 2550 Electronic Lane, Suite 211, Dallas TX. Phone 214-350-2351.

\*\*\*

Unfortunately, Clye, K7WTQ has been swamped with work and unable to get us the reprints of the UART articles. We are returning any letters we have been holding with requests and will announce any further developments. We have seen samples of the duplicate copies made by R. Wilson, WBOESF (see classified ad), and can highly recommend them. February and March of 1975 contain the latest UART articles including the UART 4.

\*\*\*

16 JULY-AUGUST 1975

From The Editor  
and  
his Mail



## BACK ISSUES

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

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

1972-MAY, -SEPT. -OCT. --  
NOV. - DEC. - [5]  
1973-ALL ISSUES. - [10]  
1974-FEB. - NOV. - [2]  
1975-JAN. - MAY. - [2]

RTTY BINDERS- \$4.00

We are completely out of all 1975 issues except for January and May, please do not ask us to start subscriptions to include these issues. Even though we printed extra copies our increased circulation has depleted most of the 74 and 75 issues.

\*\*\*

**RTTY JOURNAL**  
Box 837  
Royal Oak, Mich. 48068

Editor & Publisher 'Dusty' Dunn, W8CQ

**SUBSCRIPTION RATES**

U.S. Canada- Mexico	1st Class	\$3.00
	Air Mail	\$3.50
Other Countries	Surface Mail	\$3.50
	AirMail South-Central America	\$6.00
	Air Mail . . . All Other Countries	\$7.00

## DAYTON HAMVENTION 1975



Above--Panel at RTTY Forum. L to R. Keith, W8SDZ, Moderator, Jim, WA8SEL, Roger, K2SMN, John, WA5NYY, Paul, WB9QQD. Below--Some of the audience.



Above--A Motley Crew-John, K2AGI, (curator of the RTTY Art display), Ron, W8BBB, Dusty, W8CQ, John, W3KV. (Smiling but still standing up). Paco, XE1WU, (1st prize winner) and Paul, KH6AG.

### RTTY FORUM RECORDING NOW AVAILABLE

The recording of the 1975 Dayton Hamvention RTTY forum is now ready. The tape is available ONLY in standard half-track mono at 3-3/4 inches per second. This can be played back on any standard half-track or quarter-track reel-to-reel machine. The recording is three hours ten minutes in length. Anyone who would like a copy should send one roll of "double-time" (2400 ft.) 1/4 inch recording tape on a standard seven inch reel. Send it in a reusable mailing container. Enclose stamps in sufficient amount for return postage. 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.

JULY-AUGUST 1975 17

**CLASSIFIED ADS-- 30 words \$2. Additional words 4¢ ea.****Cash with copy, Deadline 1st of Month.**

**TECH MANUALS** -- \$6.50 each: TT-63A/FGC, CV-591A/URR following manuals \$8.50 each: TT-47/48, R-388/URR, USM-50, 51J4, FR114/U; following manuals \$10.00 each: R390A/URR, SRR-11, 12, 13, USM-32, URR-35C. Special manuals (Limited quantity): TT-03345-15 TGC-14/14A \$10, Navships 95898 TT-298A/B, TT-299A/B \$12.50, Navships 0967-170-8010 UGC-38, 40, 41 \$12.50. Model 14 TD manuals \$2.50 each. Thousands more in stock. Send 50¢ (coin) for large list. W3IHD, 7218 Roanne Drive, Washington DC 20021

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

**SELL TWO MODEL 28's** both auto car ret and line feed, down shift on space. One is floor model with 60-75-100 WPM gear shift, other is 60 WPM. also two CV483Y URA-17 solid state converters and two R-390A Receivers. Also CE200V. Purchaser to pick up. W4A-IS, 306 Thornwood Dr., Taylors S.C. 803-268-2518.

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

**Model 28 ASR - Mk III** with automatic CR LF. 60 w.p.m., oiled and adjusted. Excellent condition - mint cabinet. \$750. Will deliver within 100 miles. M. Frue, 34 53 Ann Arbor Trail, Livonia, Michigan 48150 (313) 525-9225

**IN OVER MY HEAD.** ASCII to Baudot pcb by Dodd Digital #109 with 2 ROM's, log buffer board #104 with 2-3341 FIFO chips and SWTP ASCII keyboard. All IC's and paperwork - perfect breadboard electronic KBD - you put it together. \$120 ppd. K9DNY 4021 S. Bowman Indianapolis IN 46227 (317) 787-8661.

**UT-2 KIT,** boards fit into ST-6. \$99.95. 12 Pin plug in boards alone (4) \$11.00. Cabinet for above \$9.95. Edge connectors for boards \$1.10 each. NuData Electronics, 104 N. Emerson St., Mt. Prospect, IL 60056

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

**HAL COMMUNICATIONS CORP: HEADQUARTERS** for MAINLINE Solid State RTTY Equipment. In demodulators, choose from the incomparable ST-6 or, for a low cost beginning in RTTY, the ST-5. Tailor either to your requirements by selecting the 425 Hz press discriminator, the AK-1 AFSK oscillator, and table or rack mount cabinets for the ST-6, or the AK-1 AFSK and the ST-5/AS autostart for the ST-5. Full details available in our current catalog. Charge your purchase to your BankAmericard or Master Charge account. HAL Communications Corp., Box 365RJ, Urbana, Illinois 61801. Phone 217-367-7373

**"UT-4 PC. BOARDS** Set of four plated and drilled G-10 epoxy glass boards (not thru hole plated) 2 7/8" X 7" with provisions for 12 pin edge connectors. Boards include XB-6 Dual Clock, Two UT-4 boards, and power supply board including plus 5 volts, minus 12 volts, and plus 12 volts. All boards are two sided with the exception of the power supply. \$15.00 Postpaid. Clyde Keenan, Rte. 1 Box 309, Lakebay, Washington, 98349 1-206-884-3838"

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

**RTTY STATION - HRO-500 Receiver.** Teletype Models 34ASR and 34KSR, Demodulators, AFSK, Solid State Teletype Test Set, Two-Meter FM Base, 450FM Base, 30-900 MHz Receiving System with Spectrum Display, Emcor Racks, Etc. - Write WA50VG, 9660 Leaside Drive, Dallas, TX 75238.

**"WANTED: ANY AND ALL TYPES OF FREERTTY EQUIPMENT.** Help a starving and RTTY-hungry General-to-be. Parts and TU designs accepted. W9NKB 7815 W. Grantosa Dr., Milwaukee, Wisc. 53218"

**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.

**UT-4 COMPONENTS.** AY-5-1013 UART \$8.00. Fairchild 33512 FIFO \$13 each. 2/\$25. Now also LM-309K \$1.50. See prior Journal ads for other available components and prices. Everything postpaid. May soon begin inventory phase-out of low demand items in preparation for project termination as other sources become available. Peter Bertelli, W6KS, 5262 Yost Place, San Diego, CA. 92109. 714-274-7060.

**SALE: MODEL 28 TYPING REPERF.** type 315/UG Code LPR-35 or TT317/UG code LPR-37, tape data 11/16" wide, Chadless or fully perforated; Good \$25.00; Model 28 Transmitter Distributor type TT 334/UG code LXB-9 Good \$25.00; Tuning forks 96.19 VPS, or 120 VPS. Unused \$2.00 each; Mite motor PD/82U 115 V AC 60 cy Synchronous type unused with connector \$18.00; High Speed Magnetic Tape Reader Ferranti Good \$15.00; TT Socket wrench 5/16 with 12" handle .75¢; Kleinschmidt allen wrench on 12" handle Unused .95¢; GEARS 60 wpm for Model 14 T.D. with 18- rpm Syn motor, Set Unused \$5.75 Model 14 Typing Reperf: Gears for 60 wpm for 1800 rpm Syn motor, \$6.75. Also available Model 14, 15, 19, 28, 32, 33 Machines as well as Lorenz Model 15. Send us a list of your needs. ATLANTIC SURPLUS SALES CO. 3730 Nautilus Ave Brooklyn New York 11224 (212) 266-2629

**TELETYPE MANUALS, 250B.** Adjustments and Lubrications. Model 2B Perforator Transmitter LAK, LPE, LTPE, LAAC, now \$3.50 postpaid in U.S., Bob Graham, 2105 N.W. 30th, Okla. City, OK. 73112.

**RTTY. . . MODEL MRB-TU TERMINAL UNIT.** Features: automatic shift selection-delayed autostart-all solid state - no toroids - operates on 12VDC - compact size -- guaranteed. Assembled board with motor relay, less loop supply. . \$60.00 PPD. Less relay. . \$57.00 PPD. G&M Electronics, P.O. Box 22, West Carrollton, Ohio 45449.

**FOR SALE: TELETYPE CORP Paper Winder** (1A45) excellent, \$45.00 shipped in USA. Ken Norton, 5 Bridgeport Dr. Greenville, S.C. 29607. (WB+HKZ).

**WANTED:** Source of 5/16" or 3/8" plain, ungrounded tape for Model 14 tape printer; schematics or manuals. Radiation TDMS Equipment; 1836 Iconoscope, Ken Thomson W5IFH, 1802 Edgehill, Pasadena, Texas 77502.

**FOR SALE: ELECTRAMOC FSC 250 RTTY Terminal Unit** W/all shifts switchable, built in scope tuning, and one Electrocom 100 tone keyer for 170 shift. . . Excellent condition, all manuals and equipment up to date by factory. \$250.00. Ed Trego, W9WKC, 856 E. Washington, Hoopston, IL. 60942. (217) 283-6914.

**CLASSIFIED ADS--**

**SALE: LORENZ MODEL 15 KSR** in operating condition \$75.00; Lorenz KSR with built in reperforator \$95.00; Lorenz full ASR operation with Reperf. and T.D. built in. Good condition \$125.00. All Lorenz machines come with Built in here-is answerback unit. Perforator tape 11/16" box of 10 rolls \$3.90; case of 40 rolls \$10.90; Copypolder for Model 28 cabinet \$4.75 unused; Distortion test set with scope type TDA-2, 115 V AC 60 Cy good \$29.95; Distortion set, set type TS-2B/TG 115 V AC 60 Cy very good \$39.00; Model 15 platen unused \$4.50. Model 28 Typing Reperf with keyboard TT 253A/UG complete with counter, end of line light, Chad type of punch. 115 V AC 60 Cy, Typing reperf is a LPR53 BWA, and motor in unit is a LMU-3 type. Unit complete with cover. \$165.00 good but now checked; checked \$215.00. ATLANTIC SURPLUS SALES CO. 3730 Nautilus Ave. Brooklyn N.Y. 11224.

**HAL COMMUNICATIONS CORP.** announces the DKB-2010 Dual Mode Keyboard. Provides flawless transmission of RTTY and Morse Code with standard 3 character buffer and optional 64 or 128 key buffer. Call letter identifier and "Quick Brown Fox" sequence standard. Write for detailed spec sheet. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, ILL. 61801 Phone 217-367-7373

**TTL/2 PRINTED CIRCUIT BOARD** (QST May 1969) with all parts mounted and wired, and dual frequency Discriminator/Filter board (QST June 1969) with all parts except toroids, but not mounted. Also all other parts needed to complete the unit: including power transformer, chokes, interstage transformers, tubes, schematic and parts list, etc. Will include 8-3/4" rack panel and chassis, 2AP1A with shield and socket. \$75 plus postage. W2JAV demodulator with 3BP1 tuning indicator: almost exact copy of unit in RTTY Handbook, panel but no cabinet - works well. \$75 plus postage. AUGUST OSROFF, WA6BOR, 6774 Sunny Brae Dr., San Diego, CA. 92119.

**ST-6 FACTORY WIRED** 170/425/850 autostart \$295. -- SPR- 4 with 5NB SCC4 RY-4 35 crystals: R. Lingle P.O. Box 874, McAllen Texas 78501.

**DOVETRON MPC-1000 MULTIPATH-DIVERSITY RTTY Terminal Unit** with automatic Multipath Corrector, Full In-Band Diversity, 2 inch CRT cross display, continuously variable mark and space channels (1500 to 3200 Hz), active integrated circuit filters (no toroids), noise correlator, dual autostart (Marking or FSK RTTY), phase continuous-sine wave AFSK tone generator, EIA and MIL FSK voltage level outputs, CW ID provisions for AFSK and FSK, internal RY generator, automatic mark-hold, anti-space, anti-CW, anti-fade, adjustable internal 180 volt loop supply, signal loss indicator (LED), loop keyer monitor (LED), provisions for Uart/FIFO interface. 17" x 3.5" x 9", 10 lbs, 110/220 vac. 50-400 Hz. \$495.00 FOB, stock to 30 days ARO. Your QSL will bring complete specifications. DOVETRON, P.O. Box 267, 627 Freemont Avenue, South Pasadena, Ca., 91030. (213-682-3705).

**GOODMAN IS BACK IN CHICAGO.** Model 15 KSR \$25.00. TPR-311 Kleinschmidt's \$50, tables \$10. Female jack panels (80 jacks) New, Mint in steel case - 19" mtg. \$25. Model 15 RO \$35, with keyboard \$50. Pabel Rack Cabinets 65" x 20" x 25" back and front door \$50. Ditto 33 1/2" x 20" x 25". Model 14 printing reperforators \$25. Assorted teletype tables \$10 up. All kinds of teletype and electronics - list, write your wants. Milliampere meters - 2 1/2" 0-100 center reading mounted slanted steel case with line & test switches & female plug (line indicator) AND cord \$10/. C.B. Goodman, 5454 South Shore Drive, Chicago Ill. 60615. Phone 312-752-1000-ext-516 anytime.

**FOR SALE: 2 MODEL 28KSR,** Floor cabinet, excellent condition, \$200 each. Both \$375. Pickup if possible - extra for shipping. K4JMW, 7 Janet Rd. Aiken, S.C. 29801

**ANY ISSUE OF RTTY JOURNAL** reproduced \$1.00 PP. I have a complete file of all issues. R. Wilson, WBOESF, 4011 Clearview Dr. Cedar Falls, IA. 50613

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

**UART BOARDS AND MISC:** UART clock boards use cheap TV color burst crystal for 60 and 100 WPM \$5.00. Three boards that use parallel data from UART or UART-FIFO setup: Electronic Stunt Box that decodes 12 functions from keyboard or received signal \$5.50. SELCAL that decodes up to 5 sequential letters to turn on and NNNN to turn off \$5.00, and Auto CRLF and Non-overline \$5.50. Start with UT-2 board \$5.50 and convert to UT-4 later with FIFO add on board \$5.50. Power supply board for above \$4.00. AFSK board for 8038 \$4.50. TTL CW I-D board \$5.50. Memory boards, 4.5 x 6.5 inch, 1K x 8 of 1101 or 4K x 8 of 2102, \$10 undrilled and \$15 drilled. Send stamp for more info on above and also on PLL T.U., Tuned coil T.U., Front end filter, and XT-4 boards. Parts kits available for most boards. All boards drilled, available undrilled at considerable savings. Please include 20¢ postage for each board. Larry Waldron, 131 University Avenue Lexington, KY 40503.

**DUAL-TRACE SCOPE HP-160B (USM-105A)** with delay generator \$250; Tektronix #127 unit \$50; Tektronix "D" plug-in \$50; AN/SRR-13A AM-CW-FSK Receiver 2-32 MH \$125; AN/SRR-11 VLF (14-600-KH) Receiver \$100; CV-157 Signal-Following Collins SSB-FSK Converter \$200; 75A4 (#5238) \$350; R390 \$350; R390A \$375; Model 28 KSR Console \$290; Model 28 KTR \$175; GR #1611A Capacitance Bridge \$100; Leeds & Northrup Model 2430D Galvanometer \$50; B&K "TV ANALYST" Model 1076 \$125; HP #417A 10-500 MHz VHF Detector \$125; GR Random Noise Generator #1390A \$100; TS-1618 FSK Converter Tester \$125; HP #HOI-184A \$25. PICKUP ONLY. SAN DIEGO-LOS ANGELES AREA. W6CRG 11007 Explorer Road, La-Mesa, California 92041.

**TELETYPE EQUIPMENT:** Full line Model 28 page and tape equipment. Floor Markfil sproket RO \$195.00. ASR cabinets \$50 and up. Also model 15 KSR's and RO's. 14-15-19-28 parts and assemblies. Vintage vacuum tubes. SASE for list of equipment. K8JOF 2448 N. Wilson. Royal Oak, MI. 48073.

**RECORDER CONTROLLER -** Use your home cassette recorder for high density storage of RTTY or other data. Over 125,000 characters may be stored on a half-hour cassette. Can also be used as up-down speed converter. LELAND ASSOCIATES, 18704 Glastonbury Rd., Detroit, Michigan 48219

**BUTTONS: BEAUTIFUL, PERMANENT 2" button** with safety clasp. RTTY-RTTY-RTTY etc. on yellow background with prominent RTTY in center. Your call in model 19 type. 60¢ each pp. With call in center \$1.50 Robert Morgan, 2374 Queenston, Cleveland, OH 44118.

**MODEL 28 EQUIPMENT FOR SALE:** 28KSR E/W gear shift, 28 TD-28 ROTR with stand, 14ROTR, W8HSM, 4570 Bain Park Dr. Fairview Park, OH. 44126. Tel. (216) 331-3122

**NS-1 PLL DEMODULATOR** (Journal Oct. '74 Ham Radio Feb. '75) Undrilled board \$4.75 ppd. Wired/ tested unit \$29.95 ppd. Nat Stinnette Electronics, Box 1043, Tavares, FL 32778

**SIGNETICS TTL DATA & APPLICATION BOOKS,** white hardbound covers, current edition \$5.00 per set, plus \$1.00 shipping. Only 35 sets available. Write Neil Petlock, 104 N. Emerson St., Mt. Prospect, IL 60056.

**Additional Classified****See Next Page -****JULY-AUGUST 1975 19**