'Jack'' W1BGW

**SAROC -Las Vegas - Jan. 4-7**

**FIRST CLASS MAIL**

RTTY JOURNAL

# RTTY
## JOURNAL

### January 1973

## Happy New Year

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X              1 9 7 3                                  X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X       JANUARY           FEBRUARY            MARCH     X
X    S  M  T  W  T  F  S   S  M  T  W  T  F  S   S  M  T  W  T  F  S  X
X       1  2  3  4  5  6            1  2  3               1  2  3  X
X    7  8  9 10 11 12 13   4  5  6  7  8  9 10   4  5  6  7  8  9 10  X
X   14 15 16 17 18 19 20  11 12 13 14 15 16 17  11 12 13 14 15 16 17 X
X   21 22 23 24 25 26 27  18 19 20 21 22 23 24  18 19 20 21 22 23 24 X
X   28 29 30 31           25 26 27 28           25 26 27 28 29 30 31 X
X                                                      X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X        APRIL              MAY                JUNE     X
X    S  M  T  W  T  F  S   S  M  T  W  T  F  S   S  M  T  W  T  F  S  X
X    1  2  3  4  5  6  7         1  2  3  4  5               1  2  X
X    8  9 10 11 12 13 14   6  7  8  9 10 11 12   3  4  5  6  7  8  9  X
X   15 16 17 18 19 20 21  13 14 15 16 17 18 19  10 11 12 13 14 15 16 X
X   22 23 24 25 26 27 28  20 21 22 23 24 25 26  17 18 19 20 21 22 23 X
X   29 30                 27 28 29 30 31        24 25 26 27 28 29 30 X
X                                                      X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X        JULY             AUGUST            SEPTEMBER   X
X    S  M  T  W  T  F  S   S  M  T  W  T  F  S   S  M  T  W  T  F  S  X
X    1  2  3  4  5  6  7            1  2  3  4                     1  X
X    8  9 10 11 12 13 14   5  6  7  8  9 10 11   2  3  4  5  6  7  8  X
X   15 16 17 18 19 20 21  12 13 14 15 16 17 18   9 10 11 12 13 14 15 X
X   22 23 24 25 26 27 28  19 20 21 22 23 24 25  16 17 18 19 20 21 22 X
X   29 30 31              26 27 28 29 30 31     23 24 25 26 27 28 29 X
X                                               30                   X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X       OCTOBER          NOVEMBER           DECEMBER   X
X    S  M  T  W  T  F  S   S  M  T  W  T  F  S   S  M  T  W  T  F  S  X
X    1  2  3  4  5  6               1  2  3                       1  X
X    7  8  9 10 11 12 13   4  5  6  7  8  9 10   2  3  4  5  6  7  8  X
X   14 15 16 17 18 19 20  11 12 13 14 15 16 17   9 10 11 12 13 14 15 X
X   21 22 23 24 25 26 27  18 19 20 21 22 23 24  16 17 18 19 20 21 22 X
X   28 29 30 31           25 26 27 28 29 30     23 24 25 26 27 28 29 X
X                                               30 31                X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

"73' for 73- By "DON" WA6PIR- See Next Page.

## CONTENTS -

## The "PICTURE" MAN

We are indebted and appreciative of the RTTY art work of "Don" Royer, WA6PIR for this years New Years cover. Unfortunately because of size limitations we have had to run part of the cover below, and the calendar on the front page. The title and the picture is intriguing - the XYL says it is Santa in a robe, I said the robe was there but it wasn't Santa, however I am cleaning the chimney just in case I get "What I See".

Since Don has sent pictures to so many fellows we thought you might like to see the "author" and we are re-running a photo of Don that appeared in the Journal some time ago.

***
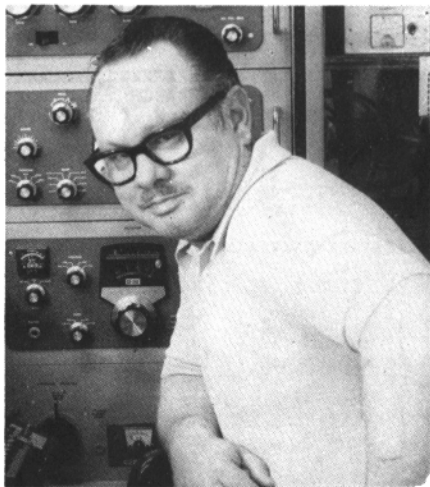
## Forty meters— Anybody?

**HITS & MISSES EDITOR:**

I am having a great problem understanding why the RTTY gang are avoiding 40M like the plague except on contests. Comes nighttime, and 20M has generally pulled the plug and the band is mostly silent except for some lonely TV saw. 80M may or may not be open, but in any event, cross-country copy is usually grinchy. And there is 7090 kHz with just the usual weak 'phone QRM, or a couple of CW QSOs and nary a RTTY signal to be found. How come? I imagine there is a perfectly dandy reason for this shunning, but it escapes me. What do we have to do to pry the RTTY inmates onto 40M? Once anyone contemplates this move, the question arises on what frequency to congregate. I feel that 7040 kHz is too low and too much into the thick of the CW portion, but I'll surely go along with the crowd, providing a crowd is provided.

> PAUL C. AMIS, W7RGL
> Route 5, Box 5559
> Bainbridge Island,
> Washington - 98110

(Any answer anybody) ***

### What You See -- Is What You Get . . .
By Don Royer, WA6PIR.

# The Digital Tape Reader - - -

## Another Approach

W.H. "BILL" CRAIG, WB4FPK
P O Box 947
GRAYSON, KTY. 41143

Bert Kellys' recent article (1) describing an IC baudot tape reader/generator for use with surplus tape reader shown in the same article is a masterpiece of simplicity. However, several aspects of the equipment (as described) left us searching for a different solution to the design problem. The following criteria was established as minimum to meet all our needs:

1) No mechanical modifications should be required in the tape reader proper, so as to be able to utilize its "repeat tape" functions. (More on this later.);

2) Eliminate the bulky (and costly) tape advance magnet supply transformer;

3) Provide as much noise immunity as possible for the logic circuits. (A must in my application, as I do all of my operating from the site of a medium power B.C. station.);

4) Provide a means of remotely controlling the unit by momentary contact pushbuttons, or direct interface to other logic circuits;

5) Provide a completely isolated keying output so that the unit may be "plugged" directly into one of several local loops without regard to polarity or grounding conditions;

6) Provide operation at four different keying speeds;

7) Provide a self-forming stop pulse, to eliminate the need for a separate stop of two different stop pulse lengths (33 ms. or 44 ms.I.E., 7.5 or 8.0 unit code pattern);

8) Provide for utilization of the electronics portion for other applications. To achieve these objectives we proceeded in the following manner:

1) Previous attempts to use this particular tape reader result in failure at speeds much in excess of 67 WPM, unless mechanical modifications are made to the unit. For this reason, it was suggested that you remove all "unnecessary" mechanical linkage to allow the tape reader advance magnet armature to function with a minimum of loading. This problem exists due to the large mass of the armature. Due to

inertia, it takes a finite time for the armature to start moving; once started and traveled to its limit, it requires a finite time to reverse, and return to the "read tape" position. Unfortunately, at 100 WPM, a one unit pulse is not of sufficient duration to accomplish this, unless the mechanical loading is considerably reduced. One possible solution would be to fabricate a "replacement" armature frame from some light-weight material. However, this is beyond the bounds of practicality for most of us. Our solution was to use a three unit pulse to advance the tape. This presents additional problems if attempted with the simple scheme such as mentioned on the aforementioned article (1), because it will require more than three units of time to allow the armature to complete its cycle. Obviously, at the end of three units of time, the armature is in the energized position. At this point it must return to the "read tape" (at rest) position, requiring some finite time interval, and in addition we must allow some time period to allow the armature to "settle", (it has a tendency to "bounce" several times), before we can read the tape. With a simple readout scheme, the only time periods we can utilize to advance the tape are during the stop pulse (1.5-2.0 units) and the start pulse (1.0 unit), which would be inadequate. The solution was to provide a means of storing the data from the tape, so that the tape could be advanced during the time period that this stored character is being transmitted. In this case, the tape advance occurs during the 2nd, 3rd, and 4th data bits (3rd, 4th, and 5th units of the baudot code), and the armature has at least three and one half units of time to return to the at rest position before the tape is again "read". (5th data bit (1 unit), stop pulse (1.5 units), and start pulse (1 unit)). Using this approach, we can now utilize the full mechanical capabilities of the tape reader. Viewed from the operator side of the unit, note that the tape gate is a sliding affair, which can be actuated by energizing a built-in selenoid. In the at rest position, (selenoid de-energized), the gate is at its extreme of travel to the right. In this position, the left hand feed roller is actuated and the tape will feed through much in the same manner as any ordinary

T.D. However, if we cause the gate to shift to the left hand side, the left hand feed roller stops, and the right hand roller now "pushes" the tape through the unit, a small spring loaded "finger" located in the square "window" of the tape gate causes the tape to start to form a loop, upwards, out through the "window". Obviously, if we were to run a length of tape with the gate in this position, and then de-energize the tape gate selenoid, allowing the gate to snap back to the right hand side, the previously run tape will be repeated, when the left hand feed roller again starts pulling the tape. Those with stunt box capabilities could program a tape with a code combination to perform this function automatically. This could be a very handy feature at times.

2) Since we can now use a relatively long "advance pulse", it now becomes feasible to "key" the magnets with a small relay. Any small relay that is reasonably fast acting can be used. It should be capable of operating with 6 volts on its coil, at a reasonable current level (77-100 ma.), and have contacts rated at about 1 amp. Suitable contact protection must be used, as shown, to prevent arcing. The tape reader coils are also rewired in a series configuration, to reduce the current requirements, and the 117 V.A.C. line is simply rectified directly with a bridge rectifier, and the resulting D.C. voltage, keyed by the relay, used to drive the tape advance magnets. Since this "loop" is completely isolated from the frame of the unit, no shock hazard exists, providing a suitable "safety ground" three wire cord is used. (Which should be on every piece of equipment in your shack anyway!) Both sides of the A.C. line are provided with 1/2 amp fuses. The rectifiers, relay, resistors etc., all fit nicely within the rear cover of the tape reader. A small bracket can be mounted to the top of the gate selenoid to provide additional mounting space for the more bulky items such as the relay, etc. 117 V.A.C. is also routed out through the multiconductor cable which interconnects the tape reader with the logic circuits to provide primary power for the logic power supply. These leads should be by-passed where they exit the unit.

3) All external data and control leads are provided with a signal voltage from within the unit. (None are left "dangling" above ground which would make them 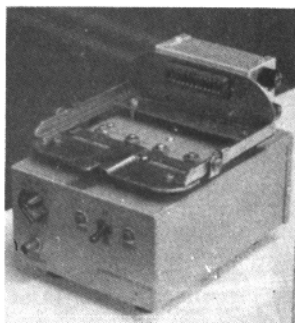susceptible to noise whenever the tape reader contacts are open, but are instead returned to logic "1" voltage source.) The external "start/stop" leads are self-protecting in this design, and only simple by-passing is required to prevent false signal pick-up from stray R.F.

4) Momentarily grounding, or applying logic "0" to the appropriate external control circuit provides "stop/start" functions.

5) The keying relay circuit uses an H.P. Clare #HMSC-1023 bistable, polarized, high-speed mercury wetted con-
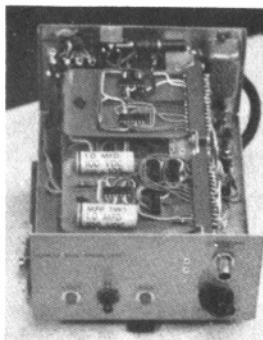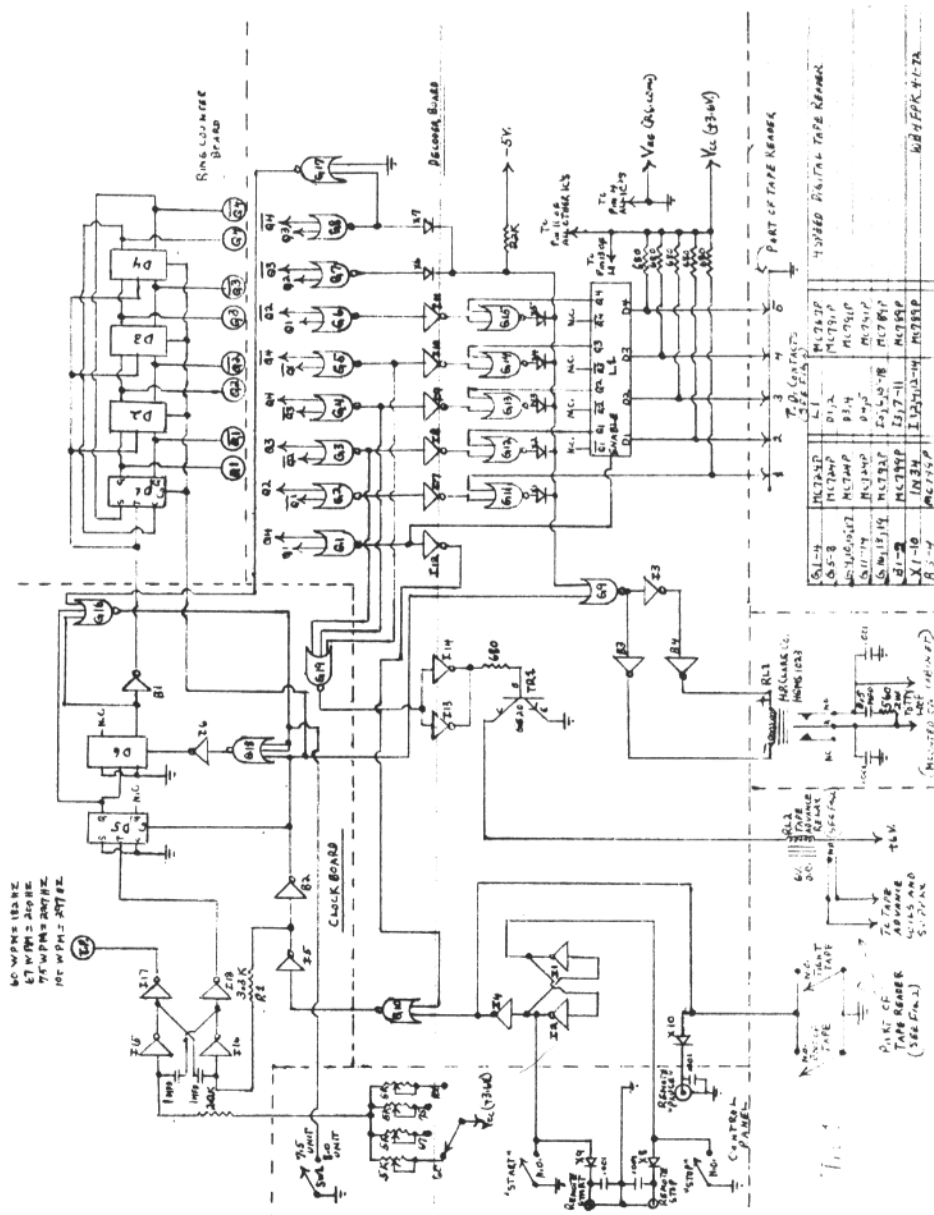


Bottom view -- Nearest plug in board is time base (clock), to rear of it - the walking ring counter board, not visible, but directly below is a 30 pin connector board which contains the balance of the logic circuits. The lower end of the mercury wetted relay is visible just to the left of center of the rear apron, one end of the large resistor connects to it and the other object at right side is bathtub capacitor that we used in the contact projection circuit.



Tape reader unplugged from mounting base showing location of four speed setting pots and small mini-box covering the AC power entry points and fuses.

Front panel controls - upper left, speed switch and below it a BNC connector for frequency meter connection. The other controls are for "stop"--"stop pulse length" and "start".

tact relay (3). This is a "sort of" polar relay. However, unlike ordinary polar relays there is no spring action to its armature, and it merely "flops" from one side to the other, depending upon the polarity of the signal applied to its single coil. This is an extremely high speed relay, so it does not appreciably add any bias distortion to the signal. In addition the contacts are sealed in an inert atmosphere which provides trouble free operation without the need for adjustment during the useful life of the relay. The contacts are rated at 1 amp/500 volts/100VA. (The latter being the normal limiting factor.) Suitable contact protection must be provided as shown. This relay operates with only 2 volts D.C. at 4 Ma., making it possible to be driven directly by RTL logic buffers (B4, B3).

6) Referring to the logic drawing, note that the clock oscillator is the circuit from the "Sel-Cal" (2) equipped with a four position rotary switch and four independent frequency pre-set controls. These provide output frequencies of 181.8, 200, 227, and 297 Hz, which when divided by D5 and D6, produce a negative going transition (at the output of B1) to toggle the dividers D1-4, at 22, 20, 17.57, and 13.47 ms. intervals for, respectively, transmitting speeds of 60, 67, 75 and 100 WPM. An isolated test point is provided for adjustment purposes.

7) Gib recognizes the coincidence of "0" logic levels on all its inputs at the end of the 30th clock pulse (negative going edge) from the oscillator. This causes a reset voltage to appear at D6 (just prior to this, "Q" of D5 is "1", "NOT Q" of D6 is "1"), causing a toggle to occur at D1-4 (about 100 ns. later) which "steps" the walking ring counter to "zero" count. In other words, to where it would be at, at the beginning of a character. In addition, both dividers (D5, D6) are in the proper state for commencing a new character. As soon as this occurs, one (or more) of the inputs to gate 16 will be "1", which will remove the reset pulse from D6. If a 44 ms. stop pulse is desired, SW-1 is closed and no reset occurs at D6, allowing the dividers and counters to cycle "naturally" back to "zero" at the end of the 32nd clock pulse. (Example: At 60 WPM, once cycle of the clock oscillator equals 5.5 ms.; hence, 5.5 times 30 equals 165 ms.: or; 5.5 times 32 equals 176 ms.: I.E., 7.5 or 8.0 unit code patterns, respectively.)

At this point a somewhat more detailed description of the logic circuits is in order: D1-4 comprise a "walking

ring counter". This will, with the addition of appropriate decoding, provide a sequential output at one, and only one gate, each time it is toggled once, from 0-7, whereupon on the 8th toggle it will return to the zero position. Assuming we have a tape in the reader, and we depress the "start" button (we have the clock set for 60 WPM), the output of 1-2 will go "0", which will cause the output of 1-4 to go "1", which will force the output of G10 to "0", and the output of 1-5 to "1", starting the clock, and through B2, lowering all the divider and counter resets to "0". For four cycles of the clock, D1-4 remain in the "zero" state, and G1 decodes this condition, producing a "1" at its output. At the same time the reset signal was removed from G9. G9 output goes "1", causing relay "RL-1" contacts to open ("space"). This condition exists for 22 ms. (start pulse). Also during this period, the output of G1 is used to "enable" the quad latch (L1), entering and storing the data received from the tape reader contacts numbers 2-5. At the end of this start pulse, the output from G1 falls to "0", and the data presented at the inputs of L1 is stored at the outputs until the next enable (start) pulse is received. G2 now has its output "1", which applied to I-7, produces a "0" at one input of G11. The other input of G11, goes to the number 1 sensing pin of the tape reader. If the tape were perforated at this position (mark) the contact would be closed, that input would be "0", and G11's output a "1", which applied to G9 through diode X1, would cause the relay (RL-1) contacts to close (mark) for 22 ms. The process is repeated for gates G12-15 in sequence. When the sequence reaches G7 or G8, these gates always produce a "1", causing RL-1 to remain in "mark" for either 33 or 44 ms. depending upon the setting of SW-1. At this point, either D6 is reset by G16 at 165 ms., or all dividers and counter stages self-reset at the end of 176 ms., and the sequence starts all over again. When we wish to stop transmitting, we depress the "stop" switch changing the state of the "start/stop" flip-flop (I-1, I-2), causing a "0" to appear at one input of G10. (This can also occur by the closure of the end of tape or tight tape switches, which allows the tape reader to self-restart when the tension is removed and a new tape inserted, as the "start/stop" flip-flop is not involved in this function.) At this point, if a character is in the process of being transmitted (other than during the start pulse interval), the out-

put of G1 will be low, which inverted by I-12 causes a "1" to appear on the other input of G10, which in turn allows the clock to continue to run. When the character is completed, and all dividers and counters reset to "zero", a "1" appears at the output of G1, is inverted

by I-12, and now since both inputs of G10 are "0", its output goes to "1", is inverted by 1-5 to a "0", stopping the clock. Also, since the input of B2 is now "0", its output applies a "1", which applied to all the divider and counter re-

sets, holds them at "zero". This signal is also applied to one input of G9 keeping RL-1 closed (mark) until the tape is again restarted.

Now, let's backtrack a bit: As you will note, G19 (a three input gate) "senses" when the 2nd, 3rd and 4th data bits occur and its output goes "0" at these times, is inverted by I-13-14, the output of which when it saturates, energizes RL-2, whose contacts close, energizing the tape advance magnets.

### CONSTRUCTION NOTES

No problems should be encountered with wiring layout if you elect to hand wire (as we did) rather than design P.C. boards, as the layout is not at all critical. Any leads entering or leaving the logic cabinet should be by-passed for R.F. The relay specified for keying the TTY loop is intended for P.C. board mounting. It must be mounted in a vertical plane, so bear this in mind when laying out the placement of components. I mounted it on the rear wall of the Bud CU-2109 minibox with a small strap of metal, which removed the keying transients from the immediate area of the logic circuits. As shown in the photo, the tape reader is mounted directly to the top of the Bud box, (the standard mounting base for the tape reader was obtained from the source listed) on short spacers. Another smaller box was used to cover the Amphenol connector, and to provide a mounting point for the fuse holders and entry point for the A.C. line. The clock adjustment potentiometers were mounted in the top of the large Bud box, beneath the tape reader mounting base where they would be readily available for adjustment purposes without having to remove the box cover itself, yet still be protected from accidental movement.

Power supply requirements are not rigid for the logic circuits, and the simple shunt regulated supply shown is more than adequate. I have found that the clock oscillator will hold within 4 Hz, which at 67 WPM is only 1% bias distortion. The "power" transformer for the logic supply is a 12 volt, center-tapped, 1-1/2 amp filament transformer, and will supply more than two times the needed current requirements. 1 or 2 amp diodes should be used in both the logic and loop supply circuits to allow for the large inrush currents, when the unit is turned on. (The diodes in the loop supply should be rated for at least 600 V. piv.) The capacitor values shown are more than adequate for filtering, and only enough capacitor need be used in the loop

supply to prevent the magnets from "chattering". I did not provide an A.C. line switch, as the unit only draws 2 watts during stand-by.

All the logic circuits can be built on one board, or split between three boards (as I did) if this is more convenient. The separation points are shown on the logic drawing as a dotted line.

RL-2 can be a Potter & Brumfield type KT11D or other similar small type from another manufacturer. I found several suitable types in my junk box, (maker unknown) that were marked "12V.D.C.", but which operated quite reliably with as little as 3 volts! So it pays to look in the junk box first if you have any kind of assortment. Most commercial relays will operate with considerably less current than their normal ratings, and should not be overlooked. Even A.C. relays will work on D.C. if the voltage is reduced.

The end of tape switch was not installed at the time the photo was taken. It consists of a finger of brass spring stock (from an old relay) mounted on a 1/4" standoff insulator, os that it is maintained insulated from the tape reader chassis by the tape itself. It was installed so as to bear against the tape at a point midway between the tape guides. The surface of the tape reader is treated, and as such is an insulator, so the area between the two tape guides must be sandpapered to a bright finish, to allow electrical contact with the end of the finger when no tape is inserted in the unit. The tight tape switch (see photo) was made from part of an old telephone type relay. A tape guide was installed (made from #10 wire) as shown.

The two 1 Mfd. capacitors in the clock timing circuit should be either tantalum types or mylar insulated, epoxy encapsulated types with a tolerance of at least 10 percent. Even so, it may be necessary to adjust the value of R-1 (nominally 3.3K) due to the variations in capacitance values, in order to obtain adequate range of adjustment of the frequency pre-set potentiometers. The range should be from 170 to 320 Hz approximately. You can substitute 2.5 K pots for the 75 and 100 speed controls which will give you more vernier action when setting them. Good quality potentiometers such as Centralab HML series or Bournes Trimpots should be used. Ordinary trim pots or "volumn control" types should be avoided as they have neither the mechanical or electrical stability required for this application.

The tape reader has been in use

# S.O.R.C.A.R.S. *self operating*
## *RTTY contest amateur station.-*

JOE KASSER, G3ZCZ/W3
1,701 East-West Hwy, Apt.205
SILVER SPRINGS, MD. 20910

### Part 2 of 3 Parts

### 15. STANDARD INFORMATION GENERATOR MODULE

In the manual non-contest qso it is quite usual for a tape to be run describing the station equipment. This tape is run each qso and may be considered as "standard information".

In the contest, the standard information may be punched on paper tape as well. Consider a typical piece of contest standard information; -
------DE G3ZCZ/W8, YOU ARE 5-MICH.

The -- represents non standard information that is multiplexed in to the data by the Data Module. Such non standard information is the other station's call, the signal report and the serial number of the qso.

The module thus consists of a tape reader reading an endless loop of tape. The data is fed to the Data Module where any gaps are filled with data originating from other modules.

### 16. MEMORY MODULE

The Memory Module is shown in outline form in Figure 11. It uses techniques described in References #11 and #12 in the decoder and call register sections. Signals from the Control Module key the Memory Module. The decoder is set up to recognize a "DE ----------" sequence. The sequence is that that appears between CQ DE G3ZCZ/W8 and or G3ZCZ/W8 DE G8BTB, in a regular contest qso. The Call Register is a long shift register that stores the incoming call sign. When the call sign is in the register, it is compared with all the calls stored in the memory. If the call is already in the memory, it is assumed that a qso has already taken place and a "worked him" pulse is sent to the Control Module. If the call is not in the memory an "attempt qso" pulse is sent to the Control Module. When the qso is over, the call in the register is read into the memory.

In order to avoid any word ending in de--- (made, for example), or a call sign ending in DE triggering the decoder, the decoder is inhibited until the

Call Recognition Module has sent the Control Module a pulse signifying that a CQ or a call aimed at G3ZCZ/W8 has been received.

The reading of calls into and out of the memory is controlled by the Replay Control Section. This unit sequences through the calls stored in the memory. If a call is recognized a "worked him" pulse is put out and the memory is reset. If the call is not recognized, the sequence stops after the last call that is in the memory, so as to be ready to read the new call into the memory if a qso is made.

The type of memory used depends on what is available at the station.

Paper tape can be used utilizing a long length of tape with the tape passing through a reader and punch in sequence, or a magnetic tape memory utilizing an endless loop of tape with the tape passing through playback and record heads in turn. If magnetic tape is used an afsk generator and terminal unit are required to convert the digital tty signal to an audio signal for recording on magnetic tape. The Replay Control section is thus dependent on the type of memory used.

If paper tape is used the access time or the time taken to read the memory is relatively long, depending on the tape speed it can be of the order of 30 to 50 calls a minute. This is slow as compared to a manual search when less than 100 stations or so have been worked. If many stations have been worked the manual and automatic searches may take the same amount of time, but are really still very slow. The access time can be reduced by employing the speed conversion techniques described in Reference #12.

The magnetic tape memory has a higher speed of operation than the paper tape memory. Its speed of operation is limited only by the frequency response of the recording/playback system and using speed conversion techniques the memory can operate in excess of 100 wpm.

A "position" signal is recorded on a separate track on the tape, or as a tone on the memory track at a different (and easily detectable) frequency to those of the mark-space signals. The Replay Control then allows the tape to move past the heads for as long as there is audio present. If no audio is present the tape

is stopped (end of calls). The tape transport is started again as required to record a call and/or to return the memory to the start position either by a rewind mechanism or by simply advancing the tape round an endless loop until the "position" signal is reached.

The endless tape loop is simple to set up if a suitable cassette is obtained, stringing tape around the shack is not to be recommended. An estimate must first be made of how much tape is required to store one call sign, then a length of tape sufficient to store all the call signs of the stations that could possibly be contacted is cut and a loop made. These techniques are simplified versions of computer storage techniques and must be adapted by each individual to fit his station and pocketbook.

It must be stressed that the memory only stores call signs. All contest data is stored in the log book (the page printer).

### 17. DATA MODULE

All data, both incoming and outgoing is routed through the Data Module shown in outline format in figure 12. BCD data from the Frequency Counter, the Clock and the Qso Counter Modules are converted to TTY using similar techniques to those described in reference #14. The tty data are then routed to either the Afsk Module or to the Printer depending on the state of the Control Module.

Two frequency comparators are located within this module, each monitoring the frequency of the vfo. Each comparator is set such that should the vfo frequency exceed the limits set by the comparators a pulse will be sent to the Tuning Module by the Control Module so as to change the direction of the motor tuning the capacitor. This is to ensure that the frequency of operation in any amateur band is kept to within the preset limits.

All circuitry within the module is standard digital stuff, that is gates flip-flops, and shift registers. The Data Module in practice evolves so as to interface the other modules as they are built.

### 18. BANDSWITCHING MODULE

During a twenty four hour contest period the optimum frequency band (assuming a hf band contest) varies depending on the time of day. It is also quite likely that after a few hours of operating a large number of stations will have been worked and no new contacts can apparently be made. It is the desirable to be able to change to another band: The band switching module is provided in SORCARS for this purpose.
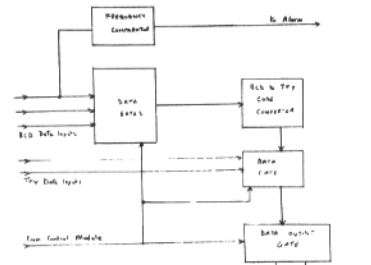
Figure 12- DATA MODULE
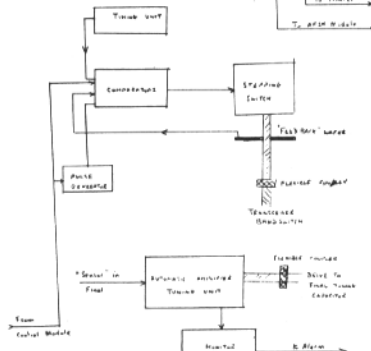
Figure 13- Band Switching Module (Outline)
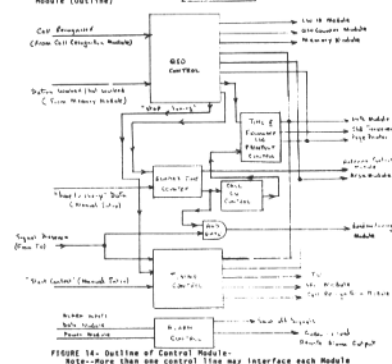
FIGURE 14- Outline of Control Module-
Note—More than one control line may interface each Module

The module is outlined in Figure 13 A stepping switch is utilized to perform the actual physical rotation of the bandswitch. A "feedback" wafer is placed on the switch to allow the position of the switch to be known by the module.

The timer controlling the actual times of setting a particular band may be an electromechanical time clock or be a function of the hour pulses output of the Clock Module.

The timer generates the "switch" pulse. The pulse generator, a simple unijunction circuit operating at a very

low frequency activates the stepping switch. When the chosen band has been selected, a coincidence detector, a simple inhibit gate, utilizing the fed back signal, inhibits the pulses from stepping the switch.

The next time the counter puts out a "switch" pulse, the inhibit gate is re-enabled until the bandswitch is stepped to its next position.

An input from the Control Module bypasses the timing unit and puts a signal into one or more 'switch to' gates, enabling a bandswitch to take place should the Control Module determine that a qso has not taken place for a pre-determined period of time and generate a "switch" pulse. If more than one gate was activated the switch will be stopped at the first one it is stepped to.

An output is also sent to the Control Module to inhibit the tuning operation for the duration of the bandswitching sequence so as not to generate any possible spurious signals.

Switching bands automatically, requires some means of automatically tuning the final. As the rtty section of each band is narrow say less than about 75 kHz, switched capacitors for each band, or a rig using an untuned wide band amplifier could be used in SORCARS. The preferred method is to employ an automatic amplifier tuning unit based on and similiar to the unit described in Reference #15.

The Automatic Amplifier Tuning Unit is considered part of the Bandswitching Module. It contains a phase detector circuit coupled to the final amplifier tank circuit and develops a signal if the circuit is not at resonance. This signal drives a servomotor coupled to the tuning capacitor. The circuitry is fully discussed in Reference #15. The "non resonance" signal is also fed to a monitor circuit not in the referenced design. The monitor circuit determines how long the module takes to tune the final. If the final is not tuned within a predetermined time, the monitor circuit detects an apparent failure in the automatic amplifier tuning circuitry, sets off an alarm, and tells the Control Module to shut off the rig so as not to cause any tvi or damage to the rig by operating it with an off resonance final. Should the antenna lead-in break, the final will not load up within the predetermined time period and the monitor circuit will shut off the rig. This facility saves coupling the Swr Bridge into the monitor circuit.

### 19. THE CONTROL MODULE
The Control Module uses standard

digital circuitry to control the operation of SORCARS. It is built up of gates, flip-flops, counters and time delay circuits. The outline format of the module is shown in Figure 14. Its operation is best considered by examining the operation of SORCARS as shown in Figure 2 in detail.

If SORCARS can be considered to be a special purpose computer built to operate an rtty station, either in a manual operator aid mode, or, as an automatic contest operator, the Control Module can be considered to be the program that controls the operation of the computer.

We regret that the length of this article makes it necessary to run it in three parts. The final installment will run next month.

\*\*\*

## Cheap Fan-fold Paper

Bill Johnston, WB5CBC
1808 Pomona Drive
Las Cruces, New Mexico 88001
July 25, 1972

Maybe somebody has already thought of this, but if not, I've found a good source of free fan-fold paper:

Almost every large computer installation throws out literally hundreds of pounds of used computer paper every day. This is usually in continuous stacks from a half an inch to six or eight inches thick. The most common size is 15 by 11 inch pages. The trick is to select that portion of the 15 inch width that seems to have the least printing on it, and cut off each side with a power saw so that you have 8-1/2 by 11 inch pages. Then all you do is turn the stack around so that when it feeds, you will be printing on the back side of the paper. Quite often you'll find that you can cut out an 8-1/2 inch width that is completely free of printing from the computer anyway.

I use a radial-arm saw and cut stacks a little over 2 inches thick. That's over five hundred continuous pages per stack. Any general-purpose saw blade will work. Just make a slow, steady cut.

73, Bill

\*\*\*

You may have possibly wondered at some time or other just how many RTTY stations are active on the bands. We have wondered too and recently received some facts from Bud, W2LFL, that may give you a fair idea. He has worked a total of 1,136 different stations of which 527 are DX stations and of these there are close to 100 different Italian stations followed closely by active German stations.

# VHF RTTY NEWS

RON GUENTZLER, W8BBB Editor
Route 1, Box 30
Ada,    Ohio 45810

The 1972 BARTG VHR RTTY Contest, Current Awareness List, and More ASCII

"The 4th VHR RTTY Contest results have been compiled and the attached list shows the final results and placings. The general comments on band conditions seem to indicate that these were not too good on the first stage but that they were a little better during the second leg. Conditions to the Continent from the U.K. were not favorable but despite this G3NYK near Ipswich managed to work across to PAØ land.

"The activity in England seemed to have been fairly evenly divided between the Home Counties and the Central and West Midlands with some activity in East Anglia. The distances between contacts for U.K. stations were a little lower than last year, but the German RTTY operators were fortunate to be able to make contacts at greater range. Notable was the contact between DJ9MJ in Munich and OE1VKW/3 SW of Vienna at 333 km....

"Summing up, the interest in the contest seems to have been maintained and the event will be held again next year, but with some changes in the scoring system. In view of past experience, it is proposed that the rules for next year will be based on the RSGB rules for VHF contests. The country multiplier will be dropped altogether and the multiplier for 432 MHz operation will be reduced. (Your comments on this would be appreciated at an early date.)

"Many thanks to all the stations who supported the event either directly by an entry or by giving contact points to competing stations, and we look forward to your continued support and interest next year." Ted Double, G8CDW, 89, Linden Gardens, Enfield, Middlesex, England.

Many thanks to Ted for managing the contest for the fourth time and for sending the information to us.

The following stations were active during the contest and gave points to stations who submitted contest logs: 144 MHz Band: DG1FG, DC0XL, DJ3GK, DJ8BT, DJ9XB/P, DK2DRX, DL2XP, DL2ZC, DL3NO/P, DL3DT, DL7HR, DL-0AF/P, DLØOG, DLØWH, DLØWNA, G3-AJS, G3NNU, G3PAQ, G3TWX/A, G3UMV, G3VZZ, G3WJG, G3ZKE. G8LT, G8AEL, G8ALL, G8CDL/A, G8CIU, G8CJL, G8CKT, G8COT, G8EDB, G8EHY, OE1MWW, OE1WWA, PAØHLA, PAØ-PMB.

## CURRENT Awareness List

The following articles and papers might be of interest to some of our readers. Although some sound quite involved, most of them are quite understandable. The various IEEE Transactions can usually be obtained at large public libraries and at university or college libraries where some technical activities take place.

Shigeo Kubota, Tsutomu Honma, and Takeshi Tsuchiya, "Chinese Character Printer with Electrostatic Recording," IEEE Trans. Electron Devices, vol. ED-19, pp. 569-579, 1972 APR. F. J. Kamphoefner, "Ink Jet Printing," IEEE Trans. Electron Devices, vol. ED-19, pp. 584-593. H. C. van den Elzen and P. van der Wurf, "A Simple Method of Calculating the Characteristics of FSK Signals with Modulation Index 0.5," IEEE Trans. Communications, vol. COM-20, pp. 139-147, 1972 APR. Herbert Drake, Jr., WB6IMP, "RTTY Distortion: Causes and Cures," Ham Radio, 1972 SEP, pp. 36-40. Elmer E. Mooring, W3CIX, "Phase-Shift RTTY Monitor Scope," Ham Radio, 1972 AUG, pp. 36-41. Nobuhiro Azuma and Kazunori Konishi, "New Alphagraphic Printer GRAPHTYPER," IEEE Trans. Communications, vol. COM-20, pp. 797-802, 1972 AUG. O.P. Layden, "Crystal-Controlled Oscillators," IEEE Trans. Instrumentation and Measurement, vol. IM-21, pp. 277-286, 1972 AUG. This last issue of the Trans. IM also contains a write up on the active line one TV system which should be interesting reading for anyone interested in transmitting information; a lot of experimental work is being done with transmitting different types of information during the vertical blanking interval on commercial TV signals including such things as time of day and "printed text" which does not appear on the screen without adaptors connected into the TV set innards.

## ASCII Again

We have received some information regarding commercially-available ASCII to Baudot and Baudot to ASCII code converters. We are presently "digesting" the information now available. Hopefully, in the not too distant future the information regarding part numbers, prices, and method of use will appear in this "column" or else as an article(s) in this publication. Frankly, we have been amazed at the amount of interest in ASCII expressed by readers of RTTY. Of course, ASCII is here, it's widely used - you can't talk to a computer without it - and it is applicable to mechanical machines like the TTY Corp. M35 as well as many video-type terminals. Too bad hams can't use it!

That's it for this month. Keep the letters, etc., coming. 73 ES CUL, RG.

\*\*\*\*\*

## GIANT FLASH DX Contest.

The rules for the 5th Giant Flash contest follow below. A major change has been made in counting each U.S. and Canadian call area as a separate country. As in the Volta contest it is not clear if a contact number should be exchanged. In the "message" instructions, "RST check number" is mentioned, in the information necessary in the logs, no message number is mentioned. Our assumption is that a number should be given with each contact.

We note under the Rules of behaviour that -- Contacts will only be valid if the contact is confirmed by Contest Logs being received from the entrant who was contacted. If this is literally true many will be thrown out as a great many participating stations never send in a log. Maybe the wording in this section is not meant the way it sounds.

1.  **CONTEST DATES**
    1st 15,00-23,00 February 24th 1973
    2nd 07,00-15,00 March 4th 1973
2.  **BANDS**
    3,5, 7, 14, 21, and 28 MHz Amateurs Bands.
3.  **COUNTRY STATUS**
    The ARRL Countries list will be used except that the W Call areas W0 to W9 and the VE Call areas from VO to VE7 will be considered as separate Countries.
4.  **MESSAGES**
    Messages will consist of:
    a) Call sign   b) RST check number
    c) Zone number
5.  **EXCHANGE POINTS**
    a) Each two-way RTTY contact with station in one's own zone will receive 2 exchange points.
    b) Each two-way RTTY contact with station outside one's own zone will receive exchange points in accordance with the "exchange points table". Note: stations may not be contacted more than once on any one band but additional contacts may be made with the same station if a different band is used.
6.  **LOGS AND SCORE SHEETS**
    Use one log for each Band.
    Logs to contain: Data, Time (GMT), Call signs, Countries, RST and zone numbers sent and received, multipliers, Country, Points ard final score.
    All Logs must be received by not later than March 30th 1973 in order to qualify.
    Send them to:     Prof. Franco Fanti
                      Via A. Dallolio 19
                      40139 Bologna, ITALY

7.  **MULTIPLIERS**
    A multipliers is given for each Country worked. A separate multiplier may be claimed for the same Country if a different band is used. The operators own Country does not qualify for a multiplier.
8.  **SCORING**
    Total exchange points times the total number of multiplier.
9.  **SWL'S**
    This contest is also open to SWL RTTYers. For the same scoring rules are valid a separate results table will be made for these entries. The Logs for SWLs must contain: date, time (GMT), Call sign of station heard, RST and Zone number sent by station heard, multipliers Countries, points and final score. The same station is only valid once on each band.
10. **AWARDS, MEDALS & FREE SUBSCRIPTIONS**
    The contest Committee will compile two separate lists.
    a) General classification
    b) Short Wave Listeners
    In each of these two classes the following awards will be made:
    1st: gold medal
    2nd: silver medal
    3rd: bronze medal
    4th to 7th: will receive a 12 month's subscription to the cq elettronica magazine.
    8th to 10th: will receive a 6 month's subscription to the cq elettronica magazine.
    There will also be awards for all of the operators and SWL's that send logs.
11. **WORLD RTTY CHAMPIONSHIP TABLE FOR 1972**
    Points and positions achieved will be valid for inclusion in the WORLD RTTY championship table for 1972. The "Giant" is the last Contest for consideration for the Championship for the year 1972.
12. **RULES OF BEHAVIOUR AND PENALISATION.**
    The Logs must be compiled in accordance with the rules listed in (6).
    The contacts must be made by means of the RTTY mode and it is not permitted to use other modes of transmission either before, during or after the exchange of messages by Radio Teletype.
    Contacts will only be valid if the contact is confirmed by the Contest Logs received from entrants with whom contacts has been made.
    During the Contest it is expected that Amateurs will observe the fundamental rules of courtesy and good operating during contacts.
    Failure to observe any of the above Rules will result in the exclusion of the entry from the final results and any such Logs received will be considered as check Logs.
    All logs received become the property of the Edition CD and will not be returned.
    The decision of the organizing Committee in any dispute will be final and any subsequent controversy cannot be referred to the Civil Court.
    I/We the undersigned declare that all the Rules of this Contest have been observed and that Paragraph 12 has been read and understood.
    \*\*\*

# RTTY·DX

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

## * 100 DXCC WINNERS *

| NR. 1 | ON4BX | 116 Confirmed |
| NR. 2 | W3KV | 108 Confirmed |
| NR. 3 | I1KG | 100 Confirmed |
| NR. 4 | ON4CK | 102 Confirmed |

## DX HONOR ROLL

| | | | | | |
|---|---|---|---|---|---|
| 1. | W5QCH | 99/93 | 17. | W4EGY | 71/66 |
| 2. | W8CQ | 98/92 | 18. | DJ8BT | 68/66 |
| 3. | DK3CU | 94/88 | 19. | CR6CA | 67/65 |
| 4. | K8YEK | 93/88 | 20. | I1WT | 71/64 |
| 5. | G6JF | 92/87 | 21. | K8QLO | 70/64 |
| 6. | W4YG | 95/85 | 22. | K6WZ | 72/63 |
| 7. | WA3IKK | 95/82 | 23. | W5VJP | 67/63 |
| 8. | W2LFL | 91/82 | 24. | W9AE | 66/63 |
| 9. | W5EUN | 85/80 | 25. | OK1MP | 65/59 |
| 10. | ZS3B | 88/78 | 26. | SV0WO | 67/58 |
| 11. | I1ROL | 83/76 | 27. | K4VDM | 62/58 |
| 12. | WA6WGL | 73/70 | 28. | W3DJZ | 83/57 |
| 13. | WA2YVK | 78/68 | 29. | DL8VX | 65/55 |
| 14. | F9RC | 76/68 | 30. | SM5BO | 60/52 |
| 15. | KL7GRF | 74/66 | 31. | HA5FE | 58/50 |
| 16. | W1GKJ | 74/66 | | | |

## DX Listing-

| | | | | | |
|---|---|---|---|---|---|
| 1. | CE3EX | 60/49 | 24. | VE4FG | 35/34 |
| 2. | K8JTT | 51/49 | 25. | PA0SCH | 55/33 |
| 3. | SM4CMG | 75/48 | 26. | VK2EG | 50/33 |
| 4. | WA0TLT | 57/47 | 27. | HB9ADM | 43/33 |
| 5. | XE1YJ | 55/47 | 28. | I6CGE | 42/33 |
| 6. | W4CQI | 59/46 | 29. | VE4BJ | 33/33 |
| 7. | EI5BH | 54/46 | 30. | WB6TLA | 43/32 |
| 8. | ZS6BBL | 53/45 | 31. | ON4CZ | 60/31 |
| 9. | K6YUI | 57/44 | 32. | WB6QFE | 37/31 |
| 10. | VE5LG | 48/42 | 33. | K3SWZ | 36/31 |
| 11. | I5CLC | 61/40 | 34. | WA5QCH | 33/31 |
| 12. | EA7PZ | 55/40 | 35. | HB9ACQ | 40/29 |
| 13. | SM0OY | 45/40 | 36. | W2IDX | 50/28 |
| 14. | I1CAQ | 43/40 | 37. | WA2EXP | 34/27 |
| 15. | W8CAT | 41/40 | 38. | W0HAH | 51/25 |
| 16. | KH6AG | 53/39 | 39. | W0MT | 43/25 |
| 17. | W5TZB | 46/39 | 40. | G3IYG | 33/25 |
| 18. | W2PLQ | 49/38 | 41. | G3LDI | 57/24 |
| 19. | 9Y4VU | 45/38 | 42. | K1SGU | 39/24 |
| 20. | ZL2ALW | 48/37 | 43. | LU2ESB | 57/22 |
| 21. | HB9AKA | 48/36 | 44. | WB2NRU | 23/21 |
| 22. | PY2CBS | 51/35 | 45. | 4X4MR | 34/20 |
| 23. | 9Q5BG | 37/35 | 46. | DL3NO | 21/19 |

The next listing of the RTTY - DX HONOR ROLL will be in the May, 1973 issue. Please have your up-dated totals to me by April 1st.

14    January 1973

---

Hello there ....

Considering the fact that there wasn't a Contest going on, November was not a bad month at all for the RTTY DXer.

Frank, ZS1ANT, has been showing up on the ham bands occasionally when he has a bit of time between his commercial schedules. The station is located at Queen Maud Land, Antarctica. They have a full complement of commercial equipment and Frank slows down the printer to 50 baud for operating on the ham bands. His QSL Manager is ZS6GE--

P. H. Bowen
34 Banket St.
Waterkloof, Pretoria
TVL, South Africa

Jay, VP8ME has been quite active and at times he gets John, VP8MX, to make some contacts on the amateur bands. This station is located on South Georgia and the name of the game is 50 bauds at about a 425 hz shift. The best times for these two stations seem to be at around 0030z and around 14080 khz. Now that Summer is approaching in those latitudes a supply ship is due in very soon and it will also bring in replacements for Jay and John. It is not known at this time whether the new operators will be amateur oriented so better look for these two stations now as the present operators are due to leave in early January.

The Canary Islands have not been heard from since the brief but active operation by Manuel, EA8CI, some months ago. However, in mid November, Mike EA8EN showed up with an excellent signal on Twenty Meters. QSL cards go to--

Miguel Hernandez
Box 215
Tenerife, Canary Islands

At about the same time Ivo, M1I, was active again from San Marino, this time for a few weeks, and giving many of the boys a new and rare country on RTTY. QSL's go via IOBNZ--

Bob Carigano
221 Silvestri St.
00164 Roma

Not too much activity from Finland
RTTY JOURNAL

---

lately but those needing the country might look for OH2BJ. He has a new beam up and promises to be quite active. A little further to the East one may find a new one from the USSR. UA9YB, George, is QRV with wide shift and has a good signal into Europe at about 0630z on 14 mhz.

We have been informed that Ian, VS6GA and Jack, DU1JS are quite active on 14 mhz at around 1400z. Recently they were heard in QSO with each other discussing the Contest so perhaps one or both did show up for the Volta RTTY Contest in early December. If so, it would mean a new country for most all of us.

Chile has become increasingly active on RTTY this past year. For a few years Henry, CE3EX, was all alone but during the past year has been joined by Pedro, CE3GK, and Mario, CE3MA. A new station recently got going and promises to be quite active, this is Steve, CE3YO. He has an excellent signal here in the States and in fact his home call is WA3PMS, Lehighton, Penna. when he is on leave from his duties with the State Department. QSL cards can reach him as follows--

Steve Roth
Santiago - State
Dept. of State
Washington, D.C. 20521

Just a bit to the North both Zip, OA4BR, and Ray, OA4HR, were active in November. Quite an occasion to have the full complement of RTTY hams on from Peru at the same time.

While Bill, VP7NH, is resting after his fantastic activity in the CARTG Contest (I'm sure he had that model 19/14 programmed by IBM) a brand new station has become active from the sunny Bahama Islands through Bill's efforts. Al, VP7NF got going about the 15th of November and is really strong in these parts, you fellows will have no trouble printing him. Also Bill, VP7NH wants you to know that he now has a QSL manager and that all cards for him should go to--

Jack C. Kohl, K9GZK
P.O. Box 312
Ripon, Wis. 54971

After receiving a card from CT1DV we realize that the QSL information given last month was pretty sparse so here is a more complete QTH--

Edgar Schneider, CT1DV
Rua Bernardim Ribiero
"Vivenda Su", Parede, Portugal

Cards are now coming through from Mike, TU2DD via his manager. Quite a few of the boys were shook up to see the confirmation marked for CW and not
RTTY JOURNAL

---

RTTY but we understand that this has all been corrected by now.

7Q7LA has not been printed here as yet but we have word that he will soon be joined by the fellow that first got on from there some years ago, 7Q7JO. He will soon be back on the printer, and incidentally he has written a few technical articles for the Journal over the years. George VK9GG, has been back in Australia for a while hence the lack of activity from New Guinea in recent weeks. Jim, YJ8JS is having machine problems we understand, but the necessary bits and pieces are on the way to him so he should be back on soon. The rumblings via the "grapevine" indicate that you soon may be hearing from these exotic areas on RTTY. CT2BG, 9H1BX, VR1AT, K0YVR/HR2, ZD9GC, 9M2IR, and at any moment now Kuwait. Active at this very moment are HM1BB, GI3XGI, and Gene, YO2AFB is back on the bands again with good sigs.

Bill, VK2EG and Eric, VK3KF, are trying to form a RTTY Group in Australia that will affiliate with the WIA on a Federal level. As it is the formative stage at the moment no further details are available but we will keep you posted as plans progress.

Here follows a request (urgent) to all present RTTY Groups. The RTTY Manager of the ARI (Italy) would like to know the Group or Society who will sponsor the 4th RTTY World Champion in 1973. For additional information please contact-- Lamberto Rossi, I1ROL
RTTY Manager, ARI
P.O. Box 50
56021 CASCINA (Pisa), Italy

This month the WAC Award was presented to--
Nr. 204 Al Vogler K1SGU

Al is quite active in Contests and DX and is located in the State of Maine.

What follows is an important announcement of particular interest to those RTTY Amateurs trying for any Awards that are presently issued or may be issued by the RTTY Journal.

As is well known to hams in any mode of operating, collecting all the QSL cards necessary to obtain an Award can be a real problem. We have had correspondence and queries from most all areas of the world during the past year and essentially all asking the same question. Is the information contained in Contest logs valid for credit toward an Award? The position of the RTTY Jounal is YES, provided of course both stations participated and submitted logs for the

January 1973    15
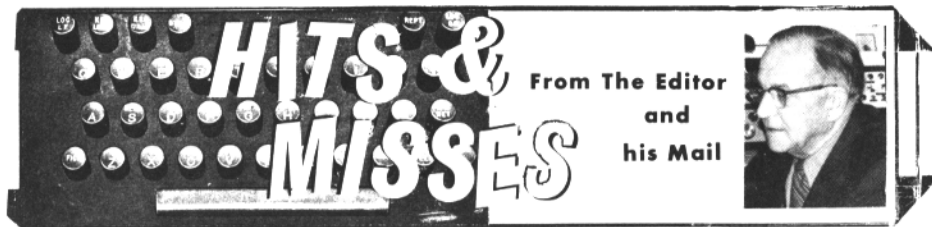
Probably because we have been receiving a lot of renewals recently, and it is handy to enclose a note with comments, we have received a lot commenting on our article last month about "Where Is Everybody?" Some say we are too low on our estimate of the number interested in RTTY. Some say we are too high. One says there are many on but we have never heard them as many are on early in the morning (this might be true, we sure would never know from our own personal listening habits.) A number gave personal reasons they were not on. Actually we were not trying to prove anything except that a lot of fellows were interested in RTTY that were not active on the bands. As far as the JOURNAL is concerned we love the silent subscriber just as much as the active ones, and they cause much less QRM.

***

Some of you may notice a different type face used on the Journal this month. Our printer tells us it is more readable and has the same word count per line. Since our printing is rather small and sometimes lightly printed a more legible style should help. Copy is typed on a machine that punches a tape and automatically justifies each line. It is then fed into a photo machine, similar in method to a TD which photographically through a spinning circular negative to make up a strip of copy. This is then pasted up in a dummy and rephotographed to make up the printing plates.

***

We have a fair supply of pictures but can always use articles. Now that winter is here maybe some of you that have been going to send in that pet idea can get time to write it up for us. We like to run a variety of different things so if your article doesn't show up immediately it is probably that it "doesn't fit in" a certain issue. Getting everything to come out even can be a chore at times, that is why we like short as well as longer items.

***

## 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.

```
1966-Oct.- Nov.-Dec.- [3]
1967- None.
1968- March. [1]
1969- Oct.-Nov.-Dec.- [3]
1970- None.
1971- Jan.-May.-June.-July-Sept
       Oct.-Nov.-Dec.- [8]
1972-Jan.-Feb.-April -May- July
      Sept.-Oct.- Nov.-Dec.-[9]
```

[MAY-June] -[JULY-August]are combined issues..............

## DX cont.--

Contest in question. The Journal will accept transcripts from any valid RTTY Contest when properly authenticated by the Contest Committee of the Group or Society running the Contest. This will apply to any Contest held AFTER January 1, 1972, repeat, January 1, 1972. Applicants for Awards are urged to hold any such confirmations received in this way until such time as they apply for an Award.

In closing, many thanks to G6JF, 15CLC, ON4BX, VK2EG, VP7NF, W3DJZ, WA3IKK, W4CQI, W5QCH, WØMT, among others, for making this possible.

73 de John

FLASH - Emile, 9G1WW and Tara, 9GIYA now QRV. Excellent signals on 14 and 21 mhz. around 2000z daily. LATE FLASH: VP2KH appeared on 20 meters Dec. 7th. Good signal and expects to be on St. Kitts for about a year.

***

## Digital Tape Reader -

since early 1972, without failure of any kind, and has only been re-adjusted one time when the frequency was in error by 3 hz. The output signal is so "clean" (compared to most mechanical tape readers) that it makes an excellent "test set" for adjusting any machine. If the oscillator is adjusted to the specified values, the bias distortion will be on the order of less than 0.25%.

This unit, whie considerably more complex than the other versions presented to date, provides enough flexibility so that it can be used as the basic electronics package for several "attachments" now being considered, such as electronic keyboard, and a frequency counter print-out attachment, which would allow a piece of equipment to be monitored with a detailed print out of the frequency measurements to be available without the need for continuous visual monitoring. These circuits will be presented at a later date.

### REFERENCES

(1) Kelly, "A Digital Tape Distributor", RTTY Journal, Dec. 1971
(2) Lamb & Malloch, "The Selcal", 73 Magazine, May, 1968
(3) Herbach-Rademan, Inc., 401 E. Erie Ave., Phil., Pa. 19134 catalog number TM-19K467 - $2.00 ea. FOB (minimum order $5.00)
(4) John Meshna, Lynn, Mass.

***

## DAYTON HAMVENTION

Dayton Hamvention is April 27-28 this year. We have changed our hospitality suite to the Imperial North Motel. You will find us in the "South Room". It is early yet but not too soon to start planning.

***

## MORSE to BAUDOT

The PETIT LOGIC SYSTEMS of Wenatchee, Wash. have announced availability within a few months of a MORSAVERTER. A device for converting Morse Code to 5 level Baudot for teleprinters.

Reads hand-sent Morse code at speeds from 5 to 40 words per minute without adjustment. Automatically compensates for reasonable irregularities in sender's timing. Prints an alarm signal if sender is failing to provide spaces between his letters.

Accepts audio output from station receiver with the aid of a simple external audio envelope detector. Built-in correlator filter separates signal from noise without critical tuning. Sidetone output permits monitoring filter performance.

Automatically supplies carriage return, line feed, LTRS and FIGS codes to RTTY machine at the proper times. 16-letter buffer memory with output enable control permits use with Teletype, electronic readouts, or computers. Variable-frequency master clock can be set to any Teletype output speed. Output data signal easily drives simple external loop keyer.

State-of-the-art design uses 48 TTL MSI circuits and 15 SSI devices. Morse code element recognizer features fully synchronous parallel arithmetic processing. System is controlled by a program co itained in two read-only memories; code conversion is accomplished in two additional ROM's. Entire Morsaverter fits on one 8 by 10 inch epoxy circuit board.

Selectable "downshift on space" and higher Morse code speeds available with simple wiring changes. 6-level ASCII code output instead of Baudot code provided if requested on order. Both serial and parallel RTTY outputs provided. RTTY-to-Morse operation available with the Model TMA-1 Teletype to Morse Adapter (to be announced).

(Wonder if we could use this to take the extra class exam?)

***

# CLASSIFIED ADS- 30 words $1. Additional words- 3¢ ea.
## Cash with copy, Deadline 1st of month.

FM MOTOROLA SCHEMATIC DIGEST - 136 giant pages 11-1/2x17 schematic diagrams, alignment instructions, crystal information, trouble shooting information. $6.50 postpaid. S.M. Wolf, PO Box 535, Lexington, Mass. 02173

GOING OUT OF BUSINESS: Loads and loads of teletype and electronic "steals". Bring your truck or station wagon, wheelbarrow or lug it on your back; but come out. Facsimile machines, Deskfax units for sending and receiving. Loaded with tubes, optics, motors, relays, switches, etc. Operable and ONLY $9.00 each cash and carry - COME & GET EM WHILE THEY LAST. C.B. GOODMAN & CO. 5826 South Western Avenue, Chicago, Illinois 60636. Phone: 312-476-8200.

11/16" PERFORATOR TAPE, 40 roll case - $7.95. Sprocket feed paper, $3 per box (FOB). "Teletype Equipment, Supplies and Information for the Radio Amateur." FREE LIST. BVE, POB 73-R, Paramus, NJ 07652.

TYPEWRITER RIBBON RE-INKER: Hand operated model now only $3.50. K575 or K764 ink available at all National Cash Register Stores, 75c per tube. Walter Nettles, W7ARS, 8355 Tanque Verde Rd. Tucson, AR. 85715.

TECHNICAL MANUAL for Model 14 TeeDee, that long searched for complete description, adjustment, lubrication and parts book all in one for only $2.25 Postpaid. BVE Enterprises, "Communications Equipment, Supplies and Information for the Radio Amateur", POB 73, Paramus, NJ 07652. (Send for free list of other goodies.)

WANTED: STELMA PC-334, PC-336 or PC-403 PC plug in or any information on these. G. S. Naniwada, JA1ACB, 3-4-8, Izumi, Hoya, Tokyo 188. Japan.

HAL COMMUNICATIONS CORP: HEADQUARTERS for MAINLINE Solid State RTTY equipment. You can do no better than the ST-6 demodulator at any price. Screened, punched cabinets for the ST-6 now available. For budget TTY, it's the ST-5 for HF or VHF. And the best in AFSK is provided by the AK-1. Our new model 1550 electronic keyer, or the MKB-1 Morse Keyboard, will automatically identify your RTTY station at the push of a button. The extra values are available from HAL Communications Corp., Box 365RJ, Urbana, IL 61801. Phone 217-359-7373.

NARROW AUDIO BANDPASS FILTERS 75HZ bandwidth, 60DB down at Fc - 150HZ. Twelve BP frequencies, Fc, from 700HZ to 2900HZ in 200HZ steps. Application notes incl. Specify Fc. $3.98 ea. plus 75¢ post. Complete set $34.95 pp. DNTCO, Box 9141, Alexandria, VA. 22304.

DIGITAL COMPUTER EQUIPMENT CATALOG: IC's, Computer Units, photo resist, etc., 50c (refundable), Postpaid U.S., MNH - Applied Electronics, P.O. Box 1208, Landover, Maryland 20785.

TWO 28KSR's - $225. each, Auto CR-LF. Two 28R/Ts, reperf/TD combination, $80. each. All equipment just overhauled. Pick up only. WA3IKK, Dusty Chapman, 2009 Lincoln St., Camp Hill, PA. 17011.

KLEINSCHMIDT TT-4A/TG printer, keyboard, used, good, $48.00 with 60-100 gears. Freight $20. east of Miss. $10. west of Miss. Also have ASR, KSR typing punches. Mark/Space Systems Co., 3563 Conquista, Long Beach, CA. 90808. (213) 429-5821.

NEW HAM MAGAZINE!! Interested in public services, humanitarian actions and international friendship? Sample issue free. Published every three weeks. Worldradio, 2509 Donner Way, Sacramento, Calif. 95818 WB6AUH

MORE RTTY! THAT'S RIGHT. In 1970 there were more feature RTTY articles in HAM RADIO Magazine than any other general amateur magazine. You need RTTY Journal, but you need HAM RADIO also. $6.00 per year; $12.00, 3 years. Ham Radio, Greenville, N.H. 03048

BACK ISSUES OF RTTY JOURNAL - I have a complete file of all issues from Vol. 1 No. 1 to date. Will reproduce any issue for $1.10 pp. Add 25c for air mail delivery. John Isaacs, 3175 Val Verde Ave., Long Beach, CA. 90808.

"RTTY SPEED CONVERTER" A drilled, fiberglass 4" x 6-1/2" printed circuit board now available for the WA6JYJ speed converter in the DEC 71 issue of HAM RADIO. $6.00 postpaid. Complete parts kit including PCB, $40.00, postpaid. P & M Electronics, 519 South Austin, Seattle, WA 98108. (41 words)

KLEINSCHMIDT MANUALS - for TT-4, TT-100, TT-76, TT-107, etc. Mite KSR teletypewriter supplies, gears, parts, covers. Wanted Teletype manuals. Send SASE for list. Typetronics, Box 8873 Ft. Lauderdale, FL. 33310. W4NYF.

"AFSK GENERATOR" - PCB and all components except input output jacks, power supply and chassis. $6.60. P & M Electronics, Inc. 519 South Austin, Seattle, WA 98108 (23 words)

MODEL 28 typing reperforator and transmitter distributor (LAXD). Both 3 speed mounted on stand with common drive motor. 2 ea. in Universal cabinet with 2 tape bins and power supply. All or part for sale. Very reasonable. A. Stein, Apt. T-2, 2012 N. Daniel St., Arlington, Va.

SALE: TT271/FG Page printer; Kleinschmidt, send receive comm. keyboard, english characters, 60-75-100 wpm. Used good. $40. each. Model 28 Typing reperf, TT315/UG Code LPR 35 tape data 11/16 wide chadless or fully perforated, TTY set M28ASR, used good, $35.00 each. Model 28 Typing reperf TT317/UG codeLPR-37 tape data 11/16" wide, chadless or fully perforated, used good, $35.00 each. Model 14 type-reperf- send receive, sync motor, end of line indicator, tape retainer, keyboard, used good, $32.00 each. Model 14 trans- distributor, sync motor, used good, $17.00 each. Synchronous motor; LMU-12 for model 28ASR, used good, $9.00 each. Synchronous motor for model 14 - 15, used, good, $5.00 each. Synchronous motor for Mite page printer 115V, 60 hz, unused, $20.00 each. FRXD-10 combo sync motor, no cover, $18.00 each. Send us your requirements. Atlantic Surplus Sales, 580 3rd Ave., Brooklyn, N.Y. 11215.

FOR SALE; COMPLETE MODEL 19, non typing reperf, TU, Hallicrafters SX115 Receiver and HT32B xmiter. Heath SB200 Linear. All in mint condition. WA8FLD, A.E. Frick, 2734 Orchard Park Dr. N.W. Canton, OH. 44718.

FOR SALE: Model 28KSR skintight, $150. 28RT, new, $50. Collins R-388, $200. TMC crystal controlled AFSK, digital dial selects shift, three center frequencies, excellent for SSB rigs, $75. 32KSR typing unit, $25. LXD TD and base for 28ASR, $30. LBXD and base for 28ASR, $25. Shipping extra, will consider swaps. WA2HWJ, 133 William Rd., No. Massapequa, NY 11758.

---

# CLASSIFIED ADS-

NEEDED FOR MODEL 26 cover glass or complete cover. Doc McEwen, W8EUT, 3271 Midland Road, Saginaw, Michigan 48603.

DOVETRON TELEPRINTER SPEED CONTROLLER - The DOVETRON TSC-1000 Teleprinter Speed Controller is an all electronic, solid-state motor controller that functions as an electronic gear shift for any teleprinter equipped with 100 WPM gears and a 50/60 Hz synchronous motor. Speed control is accomplished by varying both the frequency and amplitude of the power supplied to the motor. A five position front panel switch allows selection of 60-67-75-90-100 WPM operation. The keyboard automatically sends at the same speed as the receiving speed of the typing unit. No buffer storage is required and printer maintenance is reduced to a minimum, because the teleprinter runs only as fast as the received signal. A front panel Range control permits copy of any speed between 50 and 110 WPM with no loss of mechanical range. Copy is greatly improved on weak DX-type signals, and under severe conditions of selective fading, multi-path propagation and keyboard distortion by "synching" to the incoming signal. This Range control also permits answering a station running at a non-standard speed, giving him better copy of your signals. The AUTOSTART circuit provides remote turn-on/turn-off capability and current limiting protection for the terminal unit's autostart components. May be used with any character unit code (7.0, 7.42, 8.0, etc.). Operates directly from 110vac ↑10%, 40 to 400 Hz. Since the output of the TSC is not affected by line frequency variations at the input, stable speed control is provided for Field Day and other locations where portable or emergency power supplies exhibit line frequency instability under changing load. Attractively packaged in an 8 x 8 x 11 inch custom enclosure. 15 pounds. (21 pounds shipping). $129.50 FOB. (Calif. residents: $6.50 sales tax). DOVETRON, 1015 Fremont Avenue (PO Box 267), South Pasadena, Calif., 91030. 213-682-3705.

FOR SALE ST-6 BOARDS $10.00. Model 14 typing reperf with 60 wpm sync motor and cover $25.00 plus shipping. Sodus unit (model 15 stunt box) set up for 60 wpm, like new, $25.00 plus shipping. W9DGV 2210-30th St. Rock Island, Ill. 61201.

HAL COMMUNICATIONS CORP: Announces the revolutionary new RVD-1002 and RKB-1 solid state RTTY system. Provides the ultimate in noiseless, reliable reception and transmission of Baudot coded TTY. The RVD-1002 visual display system receives demodulated TTY pulses from the ST-6 and provides video output to a video monitor, or modified TV set. One thousand (1000) characters are displayed in a 20 line, 50 character per line format, at 60, 66, 75, and 100 WPM if your TU will copy it. The RKB-1 combines reliable TTL circuitry, a high quality commercial keyboard, and a rugged case to provide the best Baudot TTY keyboard available. The electronics is arranged so that you type as if you were using a typewriter. See them on display at Saroc, Wheaton and Muskegon. Get the details from Hal Communications Corp., Box 365RJ, Urbana, IL 61801. Phone 217-359-7373.

SALE; KLEINSCHMIDT PAGE PRINTER TT271/FG, send receive. 60-75-100 wpm, used good. $40.00 each. Typing reporforator model 28 TT315/UG code LPR-35 tape data 11/16 wide chadless or fully perforated, used good, $25.00 each, Model 14 typing reperforator, send receive sync. motor, end of line indicator, tape retainer, used good, $18.00 each. Model 28 sync motor LMU-12 used good, $9.00 each. Synchronous motor for Mite page printer 115V, 60 Hz. unused $17.50 each. FRXD-10 combo typing re perf and TD, sync, motor, no cover or retainer, $17.00 each. Send us your requirements. Atlantic Surplus Sales, 580 3rd Ave., Brooklyn, N.Y. 11215.

---

SAROC EIGHTH NATIONAL CONVENTION THE PRESTIGE convention at the Flamingo Hotel Convention Center, Las Vegas, Nevada 89109, January 4 through 7, 1973. SAROC special room rate $15.00 plus tax, per night, single or double occupancy, only 500 rooms so get your accommodations request, in early. Advance Registration $10.00 per person. Registration and eyeball session on Thursday. Seminars, Meetings, Exhibits, open Friday and Saturday. SAROC -SWAN Electronics Social Hour, Friday. Ladies Program, Saturday. SAROC Sixth National FM Conference, Friday and Saturday. SAROC-HY-GAIN/Galaxy Cocktail Party, with Leo W0GFQ, at the Organ, Saturday. SAROC Buffet Hunt Breakfast, with Champagne, Sunday. Advance Registration with Sergio Franchi Flamingo Midnight Show, two drinks, $17.00 per person. Advance Registration with Sergio Franchi Flamingo Dinner Show, no drinks, $21.00 per person. SAROC Jet Roundtrip Vacation Package Plan includes, airfare, Deluxe Flamingo Hotel Room for three nights, SAROC Advance Registration with Flamingo Hotel Dinner Show; via United Airlines departure cities; Baltimore/Washington, $280.00; Boston, $312.00; Chicago, $222.00; Cleveland, $250.00; Columbus, $246.00; Detroit, $244.00; Hartford, $304.00; Milwaukee, $233.00; New York/Newark, $296.00; Philadelphia, $290.00; Pittsburg, $262.00; via Frontier Airlines departure cities: St. Louis, $209.00; Kansas City, $188.00; Denver, $135.00; Omaha, $182.00; Lincoln, $176.00. The price quoted is per person, double occupancy in hotel room. If single occupancy in hotel room is desired add $25.00 additional per person to each amount quoted. All fares and schedules are subject to CAB rules and regularions, send for additional details. Remember to send accommodations request to Flamingo Hotel. Send Advance Registration and information request to, SAROC. P. O. Box 73, Boulder City, Nevada 89005."

TOROIDS: 88 or 44mhy. 30/$10. POSTPAID (5 $2.50). Ribbons for 14,15,19,28,32,33, Mite, Lorenzblack nylon 12/$3.50 postpaid. 60 speed gears for model 15-19 (72913-74913) $3.50/set. 11/16" tape-fresh - $8/case/40 rolls. Sprocket feed paper for all models $.50/box. Single copy roll paper (8-1/2") NEW $12.50/case/12. Late model 28 typing units, excellent $175. New cover for model 14 reperf $10. DESKFAX 6500 Tranceiver $15 (2/$25.) plus paper $3/pkg. Manual for TXC-1 FAX $7.50 postpaid. Stamp for picture catalog. Van's W2DLT Electronics 302R Passaic. Stirling, N.J. 07980.

DATA WANTED: TDMS-6EB-R.2B Scope - Appears to be a teletype signal analyzer. Currently being sold by Fair Radio Sales. Willing to pay modest sum for schematic and other info. James Wenskus, K2BEH 329 Ballad Ave., Rochester, N.Y. 14626.

HAL COMMUNICATIONS CORP. ONE SOURCE FOR ALL your construction needs. Our line of resistors, capacitors, and semiconductors will fill your requirements for practically any project. TTL devices are stocked in volume to support production of our keyers, identifiers, and the fantastic RVD-1002 RTTY Visual Display Systems. Fast service at reasonable prices. HAL COMMUNICATIONS CORP., Box 365RJ, Urbana, IL 61801. Phone 217-359-7373.

TRADE: 28 ASR base, keyboard and re-perf. WANT Bird HamMate 4352. K1IGF Edwards 83 Lovers Lane, East Lyme, Conn. 06333.

NEW 902A Scope Tube, Shield, Millen Bezel $5 PP. HYGAIN DB62 antenna $16 FOB. BC455 7mhz rcvr with supply $15 FOB. Robert Boyd, Woodlawn Ave., Kennebunkport, Maine 04046.

# ADDITIONAL CLASSFIED