CLASSIFIED ADS

continued from page 15

PRINTED CIRCUIT BOARD, TT/L (Aug. '65 QST) with schematic, pictorial, voltage chart and construction tips: $5.00 Precision Tuning Fork 400 hz. with electronics less 2-6AU6, small pwr. supply, modify to 425hz: $5.00; standard 44 or 88 mhy. toroids, unpotted: 5/$2.00 pp. USA; special larger, low resistance 88mhy; toroids, 1.5": 50¢ each; teletype test tape, either 11/16 punched paper or 1/4 inch magnetic AFSK (3.75ips) runs 7 min.: $2.00, all items above postpaid in USA. K5BQA, 11040 Creekmere, Dallas, Texas, 75218.

Dual 500 mfd. @ 25 volts, FP can type mtg, hook together for 1000 mfd. 35¢ each or 10 for $2.50 plus postage. A.R.C. Sales, PO Box 12, Worthington, Ohio. 43085.

WANTED; 28 TYPING Reperforator with keyboard chadless or chad - write Leslie De Sielvie, 4055 Oakwood Ave., Los Angeles, Cal. 90004 - phone 213-664-8322.

TOROIDS-88mhy., center-tapped, unpotted, 5/$1.50 POSTPAID. Model 26, like new $55. Brand new (never out of boxes) TR-4A rotator...$24. Page printer paper $5.50/case. Viking Valiant I factory wired, like new..$140. Heath VF-1 VFO WITH FSK built in $12. Perfect NC-300- $110. Ameco TX-62 Brand new $120. SX-28- $40. HQ-140XA- $125. Polar relays $3; sockets $.75. Rubber Stamp-three lines- $1.25 POSTPAID.

WANTED: Capacitor decade, Gonset 2 meter and/or linear. Audio oscillator, tri-band beam. Halo for 6. List for stamp; W2DLT, 302R Passaic, Stirling, N.J. 07980

WANTED- MITE 105 page printer AN/TGV-14(V); KWM-2/2A, 75S-3B/C, accessories; coils for 30K-4. Give full description. Heinlein, W7BIF, 107 Wyoming, Boulder City, Nevada. 89005

SELL or TRADE- RCA TM6B Master Monitor (TV) with console. Also WP33s, & 580D's. Also model 19 complete set- $100. - come and get it. W4AIS 7 Artillery Road, Taylors, S.C. 29687

* * *

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

First Class Mail

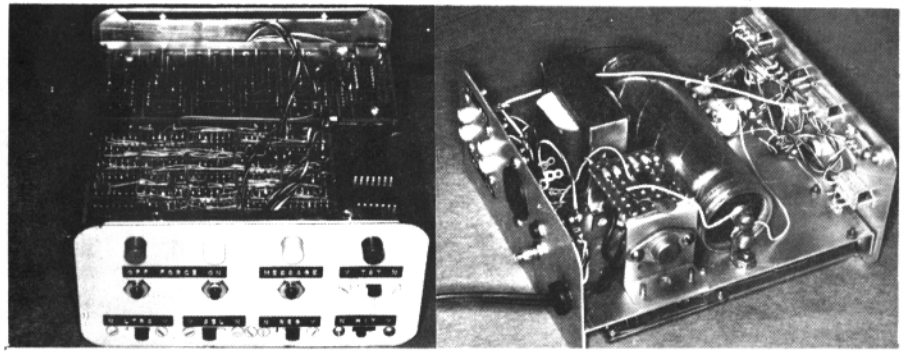
RTTY JOURNAL

JULY - AUGUST — 1967

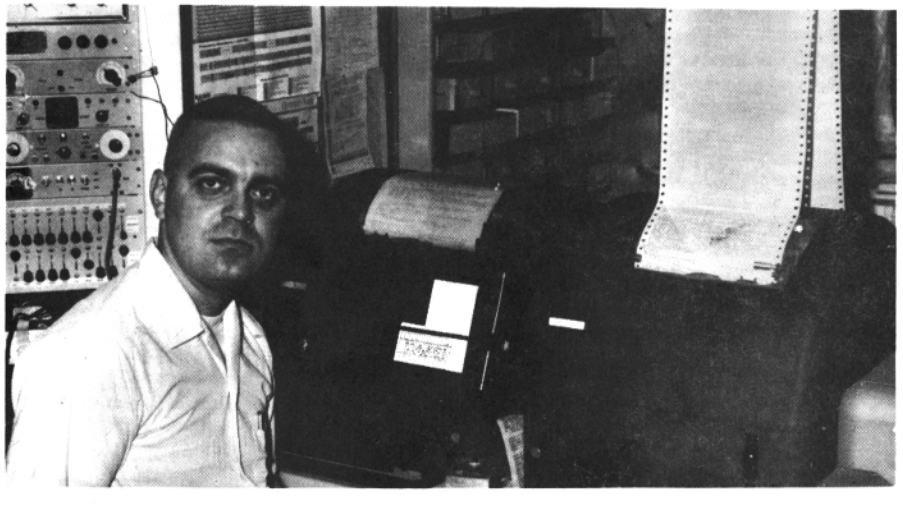
EXCLUSIVELY AMATEUR RADIOTELETYPE

Vol. 15 NO. 7 30 Cents

SELCAL - AN RTTY coded Auto Start - See page 2



Top View Bottom View



K8ERV, Mansfield, Ohio

Selcal * *

An RTTY Character Recognizer

Part two

WM. MALLOCH, WA8PCK
5501 York Lane
Columbus, Ohio. 43227

J. TOM LAMB K8ERV
1066 Larchwood Rd.
Mansfield, Ohio

The general operation of the Selcal was discussed in Part 1. The circuit is complicated by the lack of the exact logic needed. Several Nor gates are paralleled to get enough inputs, and Buffers and Inverters are used to increase fan-out, or driving power. Note that the A-B signal lines carry the same pulses, the split being just to prevent device overload. These abbreviations will be used:

I	inverter, or inverted.
SR	shift register or stage
N	used in the 4N disconnect circuits
C	character; letter being recognized
CH	channel; memory for a character
FF	flip-flop
Not ( )	circuit operating on all characters except ( ).
M-S	mark-space
Set	pulses toggling SR 5.
Shift	pulses toggling SR4-SR1
D	divider stage (by two)
Hit	non-RTTY pulses.
Hi	voltage over .8
Lo	voltage under .43

OPERATION

At the beginning of a start pulse, a Hi occurs on the m-s line, setting the Start FF (Figs. 7,8). In this "set" condition, the Start FF places a Lo on the divider preset leads, allowing them to operate. The Osc Inverter raises the voltage on the 6.8K resistor to Hi, starting the Clock Oscillator. The Clock is a multivibrator that generates 5.5ms (181Hz) square waves as shown on line 2, Fig. 9. These pulses are divided by two, five times, by the Dividers D1-D5. These waveforms are shown on lines 3-7.

* * *

Corrections to The Selcal Part One, RTTY Journal May, 1967

1. Page 2, lower right section, should read ". . .designated as (Q) and (Q).
2. Fig. 4B should read "J-K Divider".
3. Fig. 3 needs an output terminal on the collector line.
4. Fig. 4A, last line in table should be "H-H No change".
5. All references to "Nand" should read "Nor".

* * *

Recall that a Nor gate has a Hi output only if all the imputs are low. By properly selecting the Clock and Divider outputs, a set of Lo leads can be found for each single clock pulse. As an example, lets see how the single Decode pulse is obtained. At the Decode time, (line 11), D2 and D3 leads (1) are Lo, but D4 and D5 leads (1) are Hi. By selecting the (O) leads of D4 and D5, we obtain all Lo imputs for the Decode gate. D3 is not needed. Only at one particular time will the above conditions exist, so the Decode Nor gate gives an output pulse only at the proper Decode time.

In the above way, Nor gates connected to the divider outputs produce properly timed Set, Shift, and End pulses. The End pulse resets the Start FF, ending the Selcal sequence for one character. The "reset" Start FF stops the Clock Osc and presets the dividers, making them ready for the next operation. The Hit gate locks for a spacing signal partway into the Start pulse. If a Mark exists at this time (non-RTTY signal), the Hit gate resets the Start FF, terminating the operation. This resets the circuit after a false start from noise. The Set-Shift-Not gate suppresses unwanted Set and Shift pulses.

Now back to Fig. 7. Assume the call K8ERV is being received. To prevent casual copy reference to "ERV" from operating the printer, the code will be "LtrsERV" which already exists in the callsign. The first character, Ltrs, enters the Shift Register as described in Part One. At the time of the Decode pulse, the Ltrs Marks and Spaces are contained in the Register. The C1 Nor gates are connected to the five SR output leads that will give all Lo's. The C1 gates will now recognize the Ltrs character and give a Hi output to the CH1 FF. This Hi, withthe Decode pulse, causes the CH1 FF to set, remembering that character one was properly received.

The CH1 FF Lo output (lead (O)) is fed to the character 2 Nor gate, permitting it to look for, and recognize the next character, "E". As the Decode pulse transfers the "E" recognition into the CH2 FF, it also resets the CH1 FF, which insures that characters will be recognized only in the proper sequence. The "E" makes the CH2 FF output (O) Lo, and the following "R" makes the CH3 FF output Lo. This Lo, plus the SR Lo's from the "V", and the inverted Decode pulse (a Lo pulse) place all Lo inputs on the C4 gates. The Hi output from C4 Sets the Print FF, turning on the output relay and your printer. The Selcal has recognized the last four characters of the call K8ERV! Any wrong character will interrupt the sequence and reset the logic, preventing turn-on.

TURN OFF

The Print FF will now remain on until reset by a switch or by the reception of NNNN, a commercially used disconnect sequence. This section operates by recognizing and counting consecutive "N"s. The fourth N received gives an output through the 4N gate which resets the Print FF. Any character other than N operates the N-Not gate which resets the FF's, destroying the count. The Selcal must see four consecutive N characters (or upper case equivalent) somewhere in a sequence, to turn off.

ALL-CALL

An important addition byK0OJVpermits all Selcals to turn on with one particular calling code besides your selected call letters. Since recognition circuits exist for both "Ltrs" and "N", an all-call code requiring a minimum of additional logic is "LtrsNLtrsNLtrsN." This code, besides being the easiest, will not occur in normal text. The use of six characters decreases the chance of false turn-on from noise.

Fig. 7A shows the All-Call addition. This is a counting arrangement similar to the 4N turn-off, except that the sequence "LtrsN" is counted until three pairs are received, turning off the Print FF. The counter is reset by any character other than "Ltrs" or "N".

MESSAGE LIGHT

This circuit can be included to lock on a pilot light when a message is received. This alerts the operator to look at the copy. The Print FF output pulse is used to trigger a small SCR that locks on a low current lamp. The lamp is manually reset by a momentary, normally-open push switch.

CONSTRUCTION

The integrated circuits used are the Motorola RTL (Resistor-Transistor-Logic) 700 or 800 series, in a plastic dual in-line package (Fig. 11). These differ only in price and temperature range, the 700 types covering 15-55 C and the 800 types 0-75 C. The numbers are listed in Table 13. Data sheets are available from Motorola.

These logic blocks may be laid out in any order. While IC sockets are available, they are expensive and unnecessary. One way to mount the IC's is to drill holes in a plastic sheet (Fig. 11), insert the IC leads in the holes, and wire to the pins. Another way is to mount the blocks on their backs, using an adhesive, or double faced tape, and again wire to the pins. Leave plenty of room for the wires, there are several hundred of them! The easy way is to use the pair of circuit boards from K0OJV*, at $10.00 a set, undrilled. We strongly recommend small (#26) colored Teflon wire to prevent soldering iron damage in the rather cramped wiring space. The cheapest Teflon seems to be the Knight brand by Allied radio, at about 5¢ a foot.

The power supply must provide 3.6v 10% at about 600 ma. The design shown has excellent regulation and negligible ripple to about 90 line volts. Its performance is better than needed but not expensive. Z_1 is a group of forward biased diodes of any silicon type, used as a low-voltage Zener. Z_2 is optional, being a group of one-amp diodes used to limit the voltage in case of any type of supply failure. The Selcal can be operated from two flashlight batteries for testing, using a voltmeter in place of the output relay.

The power supply and front panel layouts are not critical. The only controls really needed are the force on and off switches, but all sorts of pilot lamps and other goodies can be added as described.

DECODING

Setting up the letters you wish to receive is done by hooking the particular character Nor gates to the proper SR outputs. Character 1 is shown set up for "Ltrs". The N gates are of course wired for N's, although any repeated character could be used. To construct the decode chart (Fig. 10) for any character, replace the character Marks with (1), and Spaces with (0), omitting the Start and Stop pulses. The first information pulse (after the

*Harold Quinn, 6605 Mardel Ave., St. Louis, Mo. 63109

Start pulse) will eventually be in SR1, so the chart is actually reversed from the normal character construction. Since N is S-S-M-M-S, it becomes SR1-(0), SR2-(0), SR3-(1), SR4-(1), SR5-(0). Enter your letters in rows C2, C3, C4. Now transfer this decode to the C2, C3, C4 Nor gates in Fig. 7. C1 is done for you for Ltrs. Connect each Nor gate lead to the indicated SR output lead. The SR outputs may feed more than one Nor input. This is the reason the non-inverting Buffers are used.

The simplest method of decode wiring is to permanently connect the decode leads. But two other methods are more versatile.

Fig. 15 shows how twenty inexpensive slide switches can be used to set in the four characters at will. This scheme permits fairly rapid changes in the decode set. A piece of cardboard with holes that accept the slide lever in a particular decode setup can be used to check the settings.

A still faster decode change can be obtained by using a multi-pin connector as a patch board. Each decode group is wired to a separate plug and inserted into the socket in the Selcal. Twenty-Five pins are required for a three-letter decode, Thirty pins for four letters.

The Selcal turns on the printer motor when its code set is received. If fed with continuous random noise, sooner or later the Selcal will receive its code and give an unwanted turn-on. A three letter decode for commercial or experimental copy can be obtained by grounding the C2 output lead, as shown in Fig. 7. This is not recommended for unattended copy due to the increased probability of noise turn-on. We suggest the Selcal be teamed up with an Auto-start system, such as in the TT/L to inhibit the noise fed to the input.

ADJUSTMENT

The only adjustment is the Clock Osc. frequency. Temporarily turn on the Clock by shorting the Selcal input. Connect a scope to either Clock output. Using the line frequency for comparison, adjust the 2-1/2K pot for 180 Hz output. If a scope is not available, set the pot in the center of the range that gives proper Selcal operation.

The power supply output should be 3.3-3.9 volts. It can be varied slightly by changing the 100 ohm resistor from 50-200 ohms. If greater shift is needed, change the number of diodes in Z_1. Caution, do not operate into the logic with Z_1 disconnected. A 6 ohm 5 watt resistor can be used as a supply load to simulate the Selcal when "tuning up". If a Variac is available, run the line voltage down until the output starts to drop. This should be about 90 volts, but depends on the gain of the 40310. Lowering the value of the 270 ohm resistor will reduce the required input voltage, but too low a value will reduce regulation and may overload the 2N3904.

If wired correctly, the Selcal should take off when connected as in Fig. 1, (Part One). Note that the Selcal relay will not handle a printer motor load, and must be used only to drive a suitable motor relay, such as the RBM 84-903 ($3.05).

Connect your printer into the local loop and send your call letters. The Selcal relay should turn on. If it by any chance does, you have made about 350 proper connections! Now send any letter except N, to reset the All-Call, and then send "NNNN", and hope it turns off. If not, don't despair, a troubleshooting guide follows.

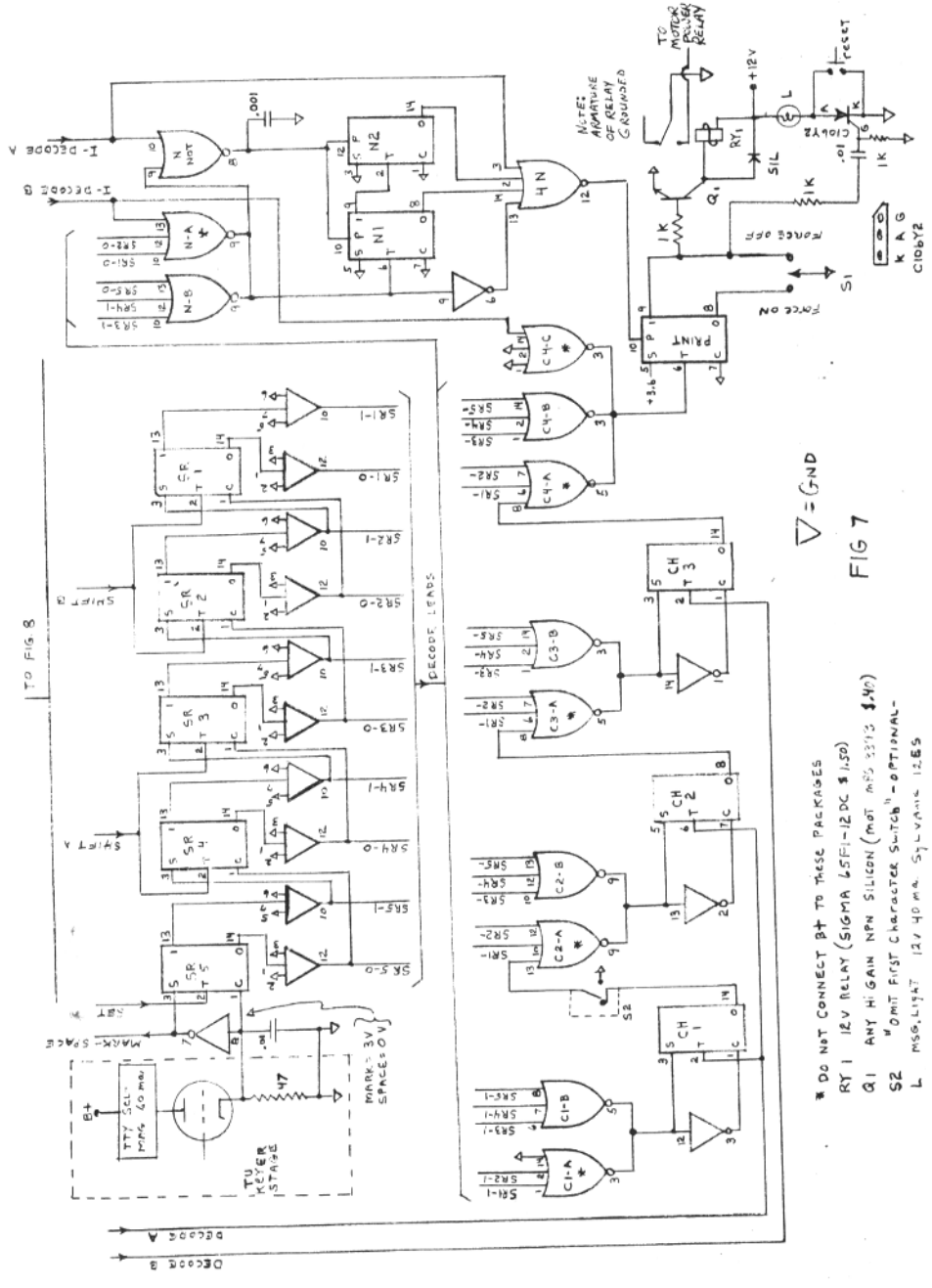
TROUBLESHOOTING

First check to see if the Start FF and Clock Osc. are being keyed. Hook a scope or headphones through a 1-K isolating resistor to the C1k-1 output. Sending any letter should produce a burst from the oscillator. Ground the Selcal input and check for proper outputs from each divider and from the Set, Shift and Decode gates, as shown in the timing chart. Any logic block pin, except B-, may be connected to B-, or grounded, to force a circuit on or off without harm to the logic.

Now check the Shift Register by sending a "Letters" character. With a voltmeter see that all the SR-1 leads are Lo (less than .43v) and that all the SR-O leads are Hi (over .8v). Send an N and check for Lo's on SR3, 4-1, and on SR1,2,5-0. Any letter should leave its proper pattern in the Shift Register. If the higher numbered SR stages work, but the lower ones don't, check the wiring and logic at the point of signal loss.

Now send any letter not in your code set. A meter should show Hi's on all of the Character FF (0) leads. Your first code character (Ltrs) should make CH1-0 go Lo. The second code character will reset CH1-(0)to Hi, and make CH2-(0) Lo, etc.

Check the 4N gate as follows. Send any letter other than "N". All four inputs to the 4N gate should be Hi. The first N will place a Lo only on 4N pin 14. The second



▽ = GND

FIG 7

* DO NOT CONNECT B+ TO THESE PACKAGES
RT1 12V RELAY (SIGMA 65F1-12DC $1.50)
Q1 ANY HI GAIN NPN SILICON (MOT MPS 3713 $.40)
S2 "OMIT FIRST CHARACTER SWITCH" - OPTIONAL -
L MSG. LIGHT 12V 40 ma. SYLVANIA 12.E5

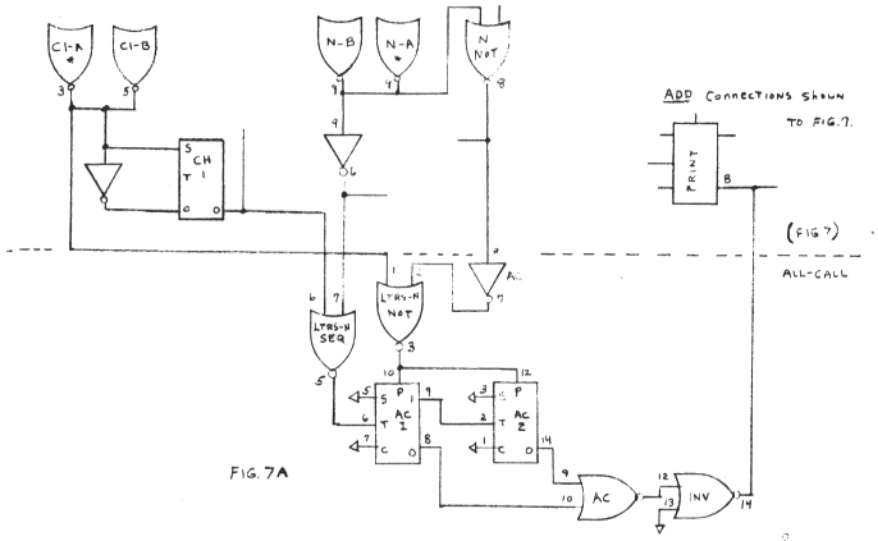


FIG. 7A

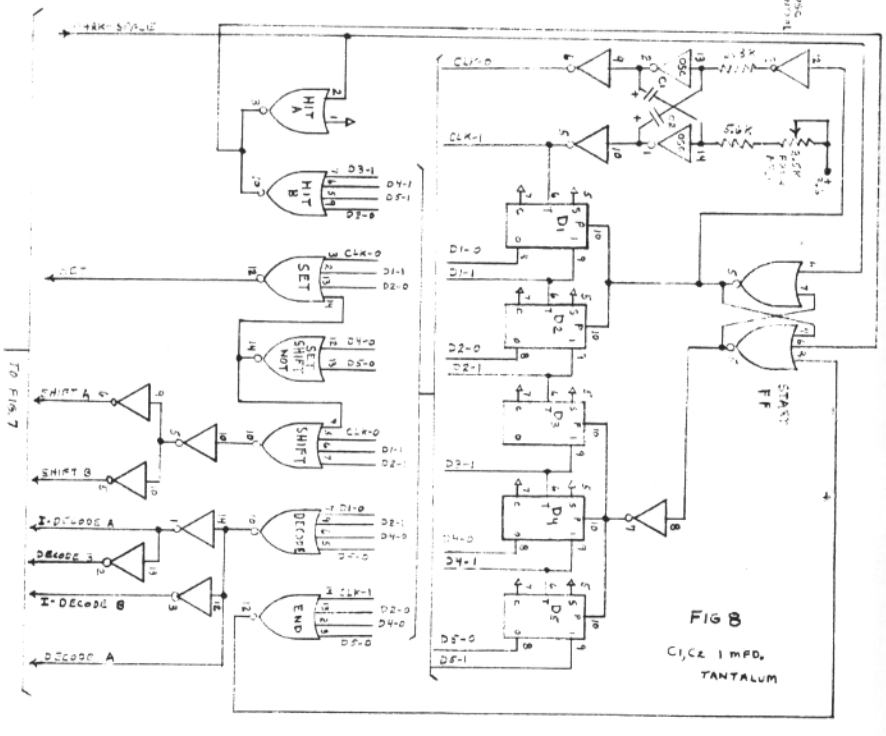


FIG 8

C1, C2 1 MFD. TANTALUM

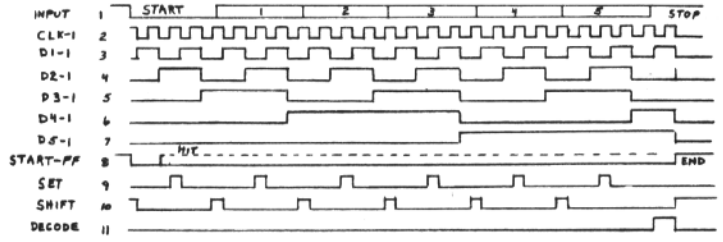


FIG 9 TIMING CHART

DECODE CHART					
SR	5	4	3	2	1
LTRS	1	1	1	1	1
C2					
C3					
C4					
N	0	1	1	0	0

FIG 10

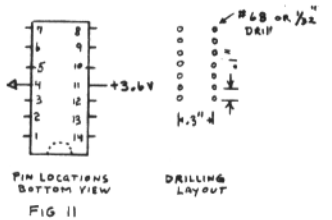


FIG 11

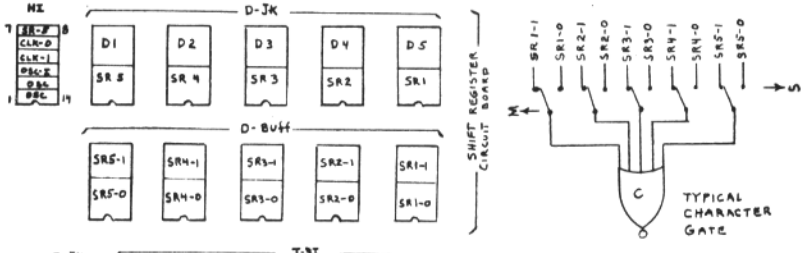


FIG. 15 SWITCHED DECODE

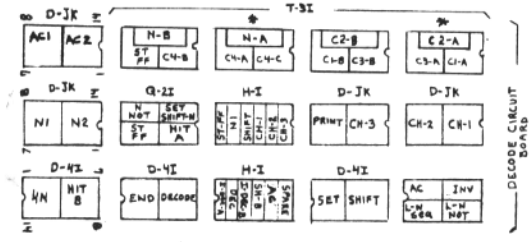


FIG 12
SUGGESTED LOGIC DIVISION AND LAYOUT

* B+ NOT CONNECTED

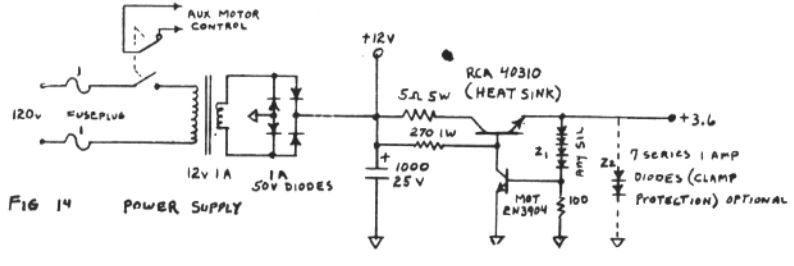


FIG 14 POWER SUPPLY

N should make only 4N pin 2 Lo. The third N will make both pins 2-14 Lo. During the fourth N, only at the Decode time, do pins 13-3 go Lo, but a scope is needed to see this. The 4N gate output briefly goes Hi, resetting the Print FF and turning the relay off. With the exception of the 4N system, most of the selcal functions hold their states after Decode, so that a voltmeter is all that is needed for testing.

USE

In operation, the receiver, TU, and Selcal are left running continuously, or connected to a time clock. The sender should transmit your call several times to insure reception and turn-on. After his call, it is helpful to include the time in GMT, followed by an extra line feed to separate the messages. After sending the message, he should return the carriage to the left, and send 8-10 N's. If conditions are poor, send extra N's to insure turn-off, any not needed will not be copied. Automatic CR-LF systems are very convenient for any unattended Autostart or Selcal operation.

A most successful Autostart Net is operating with various forms of Autostart and Selcal on 3.6375 MHz and on 7.1375 MHz, 170 shift. While anyone is welcome to join in, the main purpose of this article is to encourage the formation of other Autostart nets, on other frequencies. When the activity warrants, the Selcal could become the foundation of a large automatic RTTY traffic and emergency net.

While Autostart is not useful for monitoring continuous commercial stations, the Selcal is, and can be used to select only those parts of interest to you.*

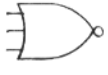
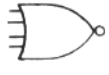
The RTTY Jounal of Jan. 67 has information on the Miami Weather Station, WBR-70, on 14.395 MHz. A few hours of copy may show some particular parts of interest. Set up the Selcal to decode the appropriate heading and you are in business. For example, the Weather Satellite predicts are sent preceeded by "TBUS". The 4N turn-off is sent regularly.

We would like to acknowledge the help of these RTTY'er's: Harold Quinn, KØOJV for his circuit suggestions, his All-Call development and his circuit boards; Tru Boerkoel, K8JUG for the parts list and kit he makes available on request;** and the many on the Autostart net who patiently listened to the groaning birth-pains of the Selcal.

*If used for 75 or 100 WPM monitoring, the Selcal Clock must be changed.

**Tru Boerkoel, K8JUG
195 Brandywyne Drive
Comstock Park, Michigan 49321

* * *

REQ'D UNITS	SYMBOL ea. section	ABBR	TYPE	"700" No.		"800" No.	
9		D-JK	DUAL JK FLIP-FLOP	MC790P	$2.00	MC890P	$2.30
5		D-BUFF	DUAL BUFFER- NON INVERT	MC788P	1.35	MC888P	1.55
4		T-3I	TRIPLE 3 INPUT NOR GATE	MC792P	1.20	MC892P	1.38
3		D-4I	DUAL 4 INPUT NOR GATE	MC725P	1.08	MC825P	1.25
2		Q-2I	QUADRUPLE 2 INPUT NOR GATE	MC724P	1.08	MC824P	1.25
3		HI	HEX (6) INVERTER	MC789P	1.08	MC889P	1.25
			LOGIC COST		38.19		43.97

THIS LOGIC IS AVAILABLE FROM NEWARK RADIO UNDER THESE NUMBERS AND PRICES

TABLE 13 LOGIC LIST

VHF RTTY NEWS

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

AN AFSK KEYER

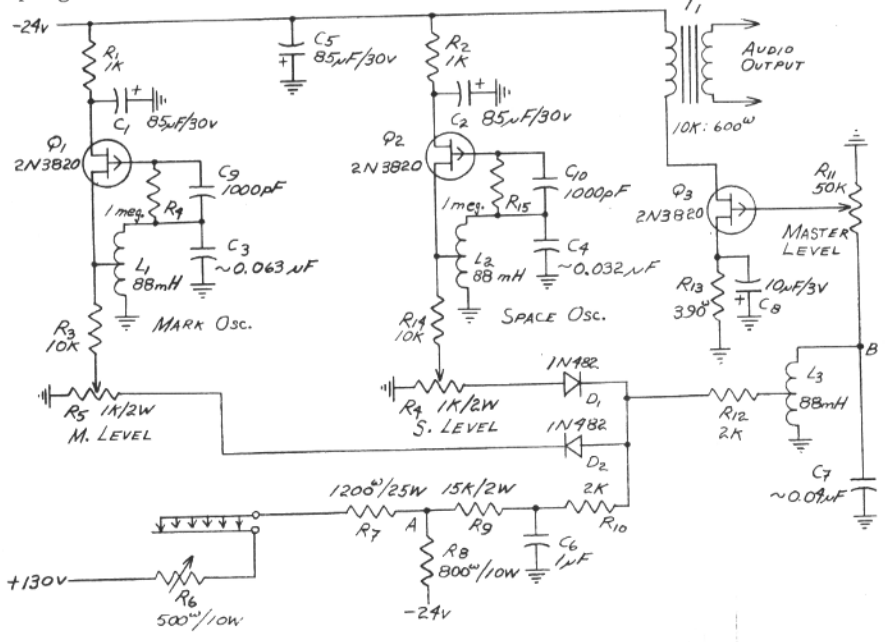
Last month we outlined the features we would like to see in an AFSK keyer. Since that writing we have developed a circuit that meets all of the requirements that we outlined, namely: 1) Loop current in the keyboard, 2) Separate oscillators for mark and space permitting independent level and frequency adjustment, and 3) Relatively minor keying transients.

The circuit will be described briefly and then various portions of the circuit will be described in some detail so that anyone wishing to improvise will have a place to start. The circuit can be built as shown.

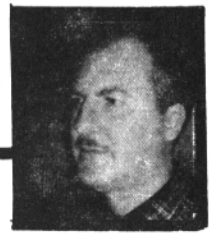
The oscillators use the familar Hartley circuit consisting of an 88 mH torroid shunted by the proper amount of capacitance to give the required 2125 and 2975 Hz resonant frequency. The oscillator transistors are 2N3820 P-channel junction-FET's. The resistors R_1 and R_2 and the capacitors C_1, C_2, and C_5 are for decoupling.

The keyboard is connected into a "loop" composed of R_6, R_7, and R_8. One end of the "loop" is fed from 130 volts and the other end from -24 volts. R_6 is adjusted to give a "loop" current of 60 mA. During marking condition from the keyboard (current flowing in the loop) the potential at point "A" is approximately 24 volts; during the spacing condition (no loop current) the potential at point "A" is approximately -24 volts. This variable potential is coupled into the diodes D_1 and D_2 thru a delay network composed of R_9, C_6, and R_{10}. The varying potential on the diodes causes one or the other to conduct. For example, during a mark the potential at point "A" is 24 volts; this voltage causes D_2 to conduct connecting the output from the mark oscillator into Q_3. The output from the space oscillator will be blocked from Q_3 because D_1 is reverse biased. During a space the voltage at point "A" is approximately -24 volts causing D_1 to conduct

Continued on page 13



RTTY-DX



JOHN POSSEHL W3KDF Editor

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

Hello there. . .

Anyone listening on the bands during the latter part of May would have been quite justified in putting the receiver on the work bench to do some trouble shooting and find out why it went dead so suddenly. I almost did until I turned on a second receiver and then suddenly realized that a massive ionospheric storm was in progress with its attendant Aurora effects. I suppose that it has been at lease a decade since this writer had witnessed such a complete communications blackout on the HF bands. However, propagation, like the weather, is much talked about but little done about. In one respect it is a great equalizer, it puts the boys on kilowatt alley and the fellows on QRP row in the same class; neither one can barely talk across town. I must qualify my statement about the weather though. One person that is really doing something about that is our old friend Jean, FG7XT. I have seen some FAX results of his early warning weather station as received from Nimbus 11 and Essa IV and they are terrific. Jean is sure to have advance warning for the Caribbean area if another hurricane comes through as did last year. Although I'm a little off the subject I think we must take our hats off to Jean for the wonderful job he has done in this field. After all, we must admit that his little island is a bit off the beaten track without such niceties as electronic supply houses with shelves full of the bits and pieces that go into a project like that. In spite of the many pitfalls and disappointments that I'm sure he had, the end results are really professional in quality.

I had a nice letter from our old friend Bud, W6CG and would like to bring you up to date on Buds' activities. After thirty-three years in Radio and Television engineering Bud has retired and recently moved into a large Mobile home in a new area. What with a change of QTH and getting set up again activity has been at a minimum but Bud expects to be back at the keyboard renewing old acquaintances and making new ones real soon. Bud would like to hear from some of his old stateside and overseas correspondents again. He can be found at - 3050 West Ball Road, Nr. 154, Anaheim, California 92804.

Our congratulations this month for the W A C Award go to--
NR. 91 Sidney Burnett VE3GK - 3C3GK
As you know, Sid was a prime mover in the formation of the CARTG which is sponsoring the 7th World Wide RTTY Sweepstakes on October 14 - 16.

Sid and his Contest Committee have done an all out job to make this Contest one of the best events ever and we can all best support them by keeping the above dates open and to get in there and give it a go. The rules will have some interesting variations, but enough for now as the coming issues of the Journal will feature a full Contest write-up.

Back in May we indicated possible activity from Jersey (GC) in August by G3PLX and the group that did such a fb job from Sark last year. I wrote to Peter and here is the situation as it stands at the moment. The arrangement they had for an operating location was cancelled and they have been unable to make other accommodations on short notice. Jersey is apparently quite a Summer resort and if you don't make reservations months in advance there just isn't anything available (sounds so familiar). As it stands they still may make a dash to Sark again as the possibility of getting a place there is not quite as bad, but this is only tentative. Peter sends best wishes to all from the RTTY group over there and is sorry that things did not work out as planned.

Alf, JX6XF, has given many of us a rare new country on RTTY but by this time Alf was scheduled to leave and return to LA land. However, I would like to say that through the kind generosity of Lou, I1ORS, there will be RTTY facilities available on Jan Mayen for any operators

that choose to make use of it in the future. Lou sent Alf a Siemens 68D small portable machine to use during his stay with the stipulation to leave it on the island so that future activity will be assured. Lou also indicates that he is trying to get RTTY going in Hong Kong. He is in contact with a chap there but there is nothing definite set up as yet.

For a small group, RTTY'ers seem to have a high percentage of world travelers. Very recently Kevin, VK3ARD was visiting at the QTH of Sam, W2BKU in New York and About three days later I printed Rene, DL3IR and he was saying that he had an "eyeball" QSO with Kevin the previous evening. It's a small world.

From Arthur, ON4BX comes word of a recent new operation from the island of Crete. The station is SV0WFF and while at the same QTH as SV0WL it is not the same station. The operator is Ron and it is indicated that he will be at this location for at least a year. His home call is K4FUV, although direct QSL's can go to Box 599, Iraklion, Crete. I should point out that during the recent political tension in this area all licenses of nationals and others were recalled. However, SVO calls are now being reissued again and we hope that Ron will be active by this time.

I had occasion to correspond with Bill Brennan, G3CQE quite recently and some of you old time RTTY'ers will be interested in knowing that Bill's lack of activity is due mainly to working away from home and only getting home on week ends. He has enough trouble keeping up with the chores that pile up in his absence much less get at the keyboard. He plans moving soon and then will be able to settle down and get on the bands again. Bill also says that the additional stickers for the BARTG QCA award (50, 75, etc) will be available shortly. Another of the BARTG front office staff, Sandy Morton writes to say hello to all. Sandy further confirms the LZ1CC on RTTY and had printed him quite a bit until recently.

Arthur, ON4BX recently sent me a tape of a Bulletin from PA0AA, official station of VERON. They send out Bulletins every Friday at 1900 - 2130 GMT on 3600, 7040, 145,145 kcs. The machine speed is 45 Bauds. Although these times and frequencies are not applicable to this area they do have a large following in Europe and cover the RTTY activities of many countries in that part of the world. The particular Bulletin that Arthur sent covered the June issue of the RTTY JOURNAL with a review of the feature articles and columns of the contributing editors. It was very nicely done and our thanks go to the PA0AA staff for the very fine publicity.

From where I sit the activity from Africa and Asia has been nil for the past two months or so. If any of you fellows have heard or worked anything from these areas let me know so that I can spread the word around. Also, one may wonder why the flurry of activity from areas like KR6, HL9, SV0, MP4, KW6, etc. for a short period and then absolute silence for months. Well, one theory is that many of these stations are at military installations or civilian technical services organizations, and in the case of U.S. military installations, they are usually MARS stations. The limiting factor is usually not so much the lack of equipment but rather the lack of RTTY oriented operators. Usually the turnover of personnel is fairly rapid and it may be quite a while before someone comes along with a hankering to tinker with all those gears and levers or timidly send out a string of RY. Another theory is that MARS stations are usually handling traffic in volume for base personnel and operate on MARS frequencies far removed from the ham bands thus avoiding the various and sundry forms of QRM that tend to slow things down.

Newt, K8QLO reports contacts with JX6SV, YV1IK, YV5CIP, OA4BR, and also says that Jim, VK3DM has a new quad up and should be putting a good signal into the states.

Some stations not already mentioned and either worked or heard on the bands have been OE2SJL, OE2GCL, OE1NP, UA4KED UA1KBW, G6JF, G3LNN, XE1PM, XE1YJ, F5MF/P, F2LR, VK3PB, VK3NR, VK3KF, DJ6ZBA, DK0IB, and DL3RNP. I1CGE was heard in QSO with LZ1BA with the LX station drifting badly. Also, KL7BAJ was printed very well here in the East while using narrow shift.

As this was being written a new country has made the scene on RTTY. Fred. HK3SO in Bogata, Colombia is on 14 mc. with a beautiful signal from a KWM-1 into a three element beam. The machine is a Model 28 KSR. His first QSO was with WA0GED, followed by Dusty, W8CQ. I

Continued on page 14

This is the combined summer-July-August-issue and we hope to have the September issue in the mail by the 20th of August, with future issues mailed the 20th of the preceding month.

* * *

The support of our readers has been most wonderful, as a result we have been thinking of some kind of a bonus we could offer. A larger magazine is not practical as even one extra page could double our mailing costs. We do hope to have one issue with additional pages and a feature article. If present plans materialize this may be the September issue and include a complete article on the popular TT/L 2 Mainline demodulator. This contains all the changes and improvements of the original TT/L article published in the RTTY magazine several years ago by Hoff and Petersen.

* * *

We may be starting a little early, but Christmas is coming and also a great majority of subscriptions to the Journal expire with the December issue. This is a busy month for us, and most everybody, so we would like to spread some of the subscription renewals to other months. If the mailing stencil on your copy has (dec7) at the end of your name, your subscription expires with the December issue. As an incentive for early renewal and to help us spread the renewals to other months any one sending in $3.50 BEFORE the first of December will receive three months extra mailings for the additional 50¢. Example if your subscription expires December 67 it will be continued through March of 1969. Airmail and Foreign subscriptions will be handled as usual as there are not too many of those. And of course if you want to renew in December that is acceptable also.

* * *

We still get a number of inquires about back issues. At the present time we have copies of all issues from April 1966 through June 1967 EXCEPT for the January issue of 1967. They are 30¢ per copy.

* * *

K8YEK has his cards for a W A S RTTY certificate. This is the first one we have heard of but there may have been some previously and we would appreciate hearing of them. Rhode Island seems to be the stumbling block for a number of "almosts" including several foreign stations. VE1 is the only Canadian district we have never heard. Maybe in the forthcoming DX Sweepstakes in October, run this year by the Canadian RTTY Group, somebody can arrange to have these two scarce locations on the air with RTTY. There seems to be considerable interest now in a W A S award and a week end sweepstakes with this in mind should attract a lot of action.

* * *

We know there are a lot of subscribers on VHF RTTY but Ron the VFH editor says you would never know it by the mail he gets. How about some of you VHF men dropping a note to Ron with any suggestions on material you would like to see on the activity in your area. And note that the VHF editor has now moved to Ada, Ohio, where he has accepted a position as professor of Electrical Engineering at Ohio Northern University. His new address appears in the VHF column.

* * *

The only reason we can see for the repeated sending of "CW ID TO FOLLOW" at the end of every transmission is that the sending station feels he is talking to someone a "little stupid" about the rules. -- or its a bad habit he can't break.

* * *

Somehow we omitted the complete address of Cashion Electronics (supplier of the TU boards in last months issue) it is BOX 7307, Phoenix, Ariz. 85011. The classified ad in the same issue had the complete address so we hope you found it there.

* * *

*** Next Month extra pages *.**

Complete Article and drawings on the TT/L2 Demodulator

Full details on the RTTY DX Sweepstakes Oct. 14-16.

continued from page 9

and D_2 to open. R_4 and R_5 control, independently, the levels from the two oscillators while R_{11} controls both levels simultaneously.

The network composed of R_{12}, L_3, and C_7 is essentially a "simple-minded" bandpass filter. The output stage is a common-source amplifier transformer coupled to the transmitter audio input circuit.

The remainder of this discussion is devoted to certain portions of the circuit.

Capacitors C_1 and C_2 can be any value greater than 1 uF. C_5 should be as large as practical. The resistors R_1 and R_2 provide a convenient means for monitoring the drain current of the oscillator transistors. We had some trouble with the 2N3820 J-FET's and found that it was necessary to "select" the transistors to be used. The transistors were selected by monitoring the drain current as the supply voltage was increased. If the gate-channel breakdown voltage was exceeded, the drain current would increase rapidly with increasing supply voltage; a transistor was rejected when it would not withstand a supply voltage of 30 volts. It might be wise to use some other transistor type number or a power supply voltage lower than 24 volts. It is possible to effectively lower the power supply voltage by increasing the value of R_1 and R_2. (we used 24 volts because we have lots of it available and because we wanted the oscillator output voltage as large as possible.) The other requirement in the "selection" process is that the transistor must oscillate. (Some would not!)

Once the proper transistors were obtained, it was found that the frequency of oscillation changed no more than 2 Hz when the supply voltage was varied from 10 to 30 volts! Therefore no regulation is required in the power supply.

The diodes D_1 and D_2 and should be silicon junction diodes. This is desirable in order to get a good forward to backward resistance ratio with the magnitudes of oscillator and switching voltages available. We used the 1N482 because it was readily available.

The switching delay network composed of R_9, C_6, and R_{10} can be changed if more diode current is required or if the time constant is considered too long. In the circuit shown, the total switching time is approximately 8 cycles at 2125 Hz or about 4 mS.

The "filter" network composed of R_{12}, L_3, C_7, and R_{11} is tuned to resonate at approximately 2550 Hz. The best tuning method is to adjust the size of C_7 so that mark and space tones appear at the output at the same levels when R_4 and R_5 are wide open. The Q of the L_3-C_7 circuit is kept low by using the 50K potentiameter, R_{11}, and the coupling resistor R_{12}. This "filter" serves several purposes: 1) It cleans up any harmonics from the oscillators, 2) It removes the harmonics generated during the switching time when the diodes are partially conducting, and 3) It helps remove the low frequency transients caused by the DC used to switch the diodes. A measurement on the unit described showed a fundamental frequency (2125 or 2975 Hz) voltage of 200 mV at point "B". The second harmonic of 2125 Hz (4250 Hz) was 1 mV and all other harmonics were much less than 1 mV.

The output stage was a mistake! We were having so much fun with the J-FET's that we forgot about their square-law characteristics. Actually, the output stage shown is acceptable, but it might be better to use a bipolar transistor for this stage. For the unit shown, the second harmonics of mark and space are 30db below the fundamentals at the secondary of the output transformer.

A single common-collector stage would give the required high input impedance but no voltage gain. The best solution appears to be a common-collector stage followed by a common-emitter stage transformer-coupled to the load.

The -24 volt power supply should be "stiff" so that the loop keying does not affect the keyer in a manner other than the desired one. If less than 24 volts is desirable, change the 800-ohm resistor to a value that will give a voltage drop equal to twice the supply voltage when 60 mA is flowing thru it. For example, if a 12-volt supply is used, R_8 should be 400 ohms. It is possible to use a positive power supply for the keyer. If a positive supply is to be used, use N-channel J-FET's, reverse all four electrolytic capacitors, connect the "bottom" end of R_8 to ground, connect the "bottom" ends of R_4 and R_5 to the positive power supply terminal, use a new value of R_8 as described above, and decrease R_7 to a convenient value. It may be necessary to place a capacitor in series with R_{12}.

One note of caution: As is the usual case, too many selector magnets in the loop will cause spacing bias on the transmitted signal. This circuit is no exception. The spacing bias can be eliminated by increasing the size of Rg. The best way to eliminate the possibility of spacing bias is to use only the keyboard in the keyer loop as shown in the figure.

A simple, but effective method for checking for spacing bias was described in our article in the April 1965 Issue of RTTY. See Figure 3. We will probably repeat part of that article and expand it in a future Issue.

SO WHAT'S NEW?

Well, we can definitely say one thing: We have not been responsible for the overload that is plaguing the U.S. Post Office Dept.!

We have just received a letter from Bob Jackson, W5FCP reporting activity in Dallas, Texas. Bob reports that the following ten stations are operating 40F2, vertically polarized, on 146,700 MHz: WA5QEX, WA5FHV, WA5KIM, K5ARG, W5PCX, WA5FZQ, W5FCP, W5ARN, K5MWA, and W5JLI. Bob says the net meets Friday nights at 2000 CDST (0100Z, Saturdays).

Here is the "box score" to date:

Akron Ohio (146.700, 40F2, Vert) - 1
Chicago (145,51, 6A2, Horiz) - 24
Cleveland (146.700, 40F2, Vert) - 6
Dallas (146.700, 40F2, Vert) - 10
Detroit (146.700, 40F2, Vert) - 12
Flint, Mich. (146.700, 40F2, Vert) - 2
Los Angeles (147.6, 6A2, Horiz) - 2
Milwaukee (146.880, 40F2, Vert) - 16
Portland Maine (146.7, 6A2, Hor) - 13
San Francisco (145.92, 6A2, Vert) - 5
Toledo (146.700, 40F2, Vert) - 2
Twin City (52.600, 40F2, Vert) - 8
Wheeling W. Va (146.700, 40F2, Cir) - 1
Wichita Kan. (146.700, 40F2, Vert) - 5

So that's it for now, 73, RG

RTTY JOURNAL
P.O. Box 837 — Royal Oak, Michigan 48068
"Dusty" Dunn — W8CQ
Editor & Publisher

SUBSCRIPTION 1 Year- (11 issues)

U.S.-Possessions - Canada--	
First Class Mail	$3.00
Air Mail	3.50
All Foreign Countries --	
First Class	$3.50
Air Mail	5.50

– DX NEWS –

continued from page 11

printed him in QSO with Bert, OE1NP, and followed next, to be followed by Peter, K8YEK. I imagine that Fred will be quite busy the next few weeks giving out contacts from this new country. His appearance is a welcome relief from the usual summer inactivity.

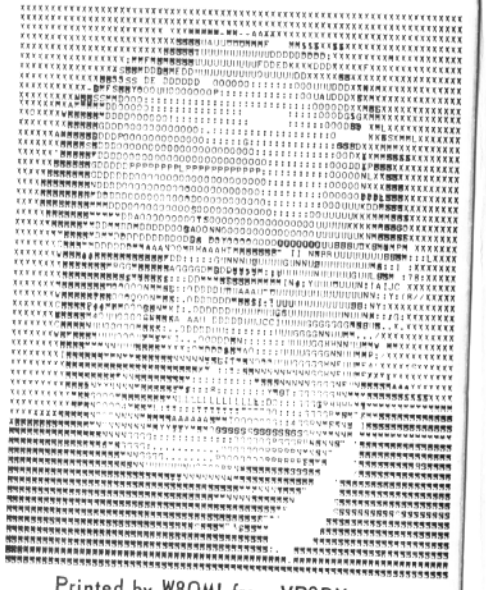
Well, here we go again fellows. The September issue will carry the quarterly listing of the DX HONOR ROLL. To be listed I will need your figures by the 5th August. Please send a postcard, letter, or even teletype your score of countries worked and countries confirmed.

That is about it from here. Keep the information coming as every little bit helps. Hope that you all enjoy what is left of the Summer and that you South Temperate Zoners don't have too severe a Winter.

73 de John

* * *

Sir Winston Churchill



Printed by W8QMI from VP9BY

K0IRV W9WKC K8JTT

CLASSIFIED ADS-

Rate $1. — 30 words. Additional words 2¢. Closing date 1st of month.

TT63A REGENERATIVE REPEATER, helps receive biased, distorted signals, also serves as RTTY converter, complete with tubes, cable, and instructions for using the unit. Like new $20. FOB Brooklyn. RTTY Dual Frequency Shift Tone Converter: Northern Radio type 152, each tone converter is self contained w/ power supply, tubes, conversion details and schematic. Used-good-$210.00 each. Model 2A perforator used good $30.00 each. Send us your RTTY requirements. Altantic Surplus, 250 Columbia St. Brooklyn, N.Y. 11231.

TYPEWRITER RIBBON REINKER, Hand operated model now only $3.00. K575 or K764 Ink available at all National Cash Register Co. stores at 75¢ per tube. Walter Nettles W7ARS-8355 Tanque Verde Rd. Tucson, Ariz. 85715.

FOR SALE - Squelch Adapter Modification Kit, used on Hammarlund radio receiver SP600. Kit includes tubes, squelch adapter unit, nameplate, knob, skirt assembly, cable clamps and instruction sheet unused - $7.50 each.

Plug in networks, Northern Radio Type 153Z, No. 10 or No. 14, these are interchangeable with Northern Radio Converter 152 model 2, Northern Radio Tone Keyer 153 and Frequency Shift Tone Keyer and converter 164, unused $7.50 each. Polar Relays 255, $1.25 each. Min. order $5.00 Three headed T.D.s with synchrous motor $40.00. Frequency Shift Keyer Northern Radio type 105, Model 4A with power supply $75.00 each. Atlantic Surplus Sales, 250 Columbia St. Brooklyn, N.Y. 11231.

FOR SALE- WHEATSTONE OILED 15/32 perf tape for CW Boehme keying heads. Any quantity. P.L. Lemon, W6DOU, 3154 Stony Point Rd. Santa Rosa, Cal. 95401.

FOR SALE - Two Tone Transistor Demodulator as described in cover article June RTTY JOURNAL 1967-glass-epoxy PC board, drilled, $8.00 postpaid with all instructions for building and adjusting. Cashion Electronics, P.O. Box 7307, Phoenix, Ariz. 85011.

FOR SALE; 255PR $2.50. Sockets $1.75 MDL-14 RO reperfs without cover or standard base. Includes cables and sync motor, excellent, plug in and operate $40. 3-Headed TD with Sync motor $60.00 Sync motors with fan $10.00. New aluminum MDL-15 bases $7.50. Loop power supplies 115VDC at 680ma. $10.00 New MDL-15 bases with governed motor and cables $15.00. Other small parts available. Payment must accompany order. B.L. Ferris, PO Box 672 East Flat Rock, N.C. 28726.

FAIRBANKS, Alaska Centennial Exposition, KL7ACS official station. Visitors call on 3866 or 145350. Informal get togethers, KINGSKUP, Noble Street, noon Saturdays. Commemorative SL'S sent. RTTY.

SELL or TRADE; SX115, new condition $300.00 SX117 Excellent, $275.00, 100V Central Electronics exciter $400., CV89 TU-$225.00, Model 15's, sync motors, excellent with tables and covers, these are Al machines, $100.00. W4AIS, George Tate, 7 Artillery Rd. Taylors, S.C. 29687.

WANTED - Teletype Parts for all machines. Models 14, 15, 19, and 28 etc. Must be new in Teletype Corp. pack or military with 5815FSC ....Phil, K2HJC, Box 96, Morrisonville, New York 12962.

AM MOVING, must dispose of complete file of RTTY, Volume 1. No. 1 to date. Not bound. Four copies on Xerox, all others original, Make offer. W2TAM, 140 Summit Ave., West Trenton, N.J. 08628.

BUY - 28 TYPING units, etc., and all parts. Sell 14s 15s 28KSR. 28ASR, parts. W4NYF, 405 NW 30th Ter., Ft. Lauderdale, Fla. 33311. phone 305-583-1340 after 9.

RTTY GEAR for sale. List issued monthly. 88 or 44 mhy toroids 5 for $1.75 postpaid. Elliott Buchanan W6VPC, 1067 Mandana Blvd., Oakland, Calif. 94610.

SERVICE-BUY-SELL, RTTY - Cleaning and repair of Teletype machines. Have in stock every part for model 14, 15, 19, and many parts for 12, 26, 28, 32, 33, 35. Teletype machines all models, in any style, and all special features available. Will buy, trade or sell teletype parts and machines. 88 mhy toroids 5 for $1.50 postpaid. Call or write, Martin Geisler, 8926 Kester Ave., Van Nuys, Calif., 91402. Phone (213) 892-0685.

WANTED - Your extra teletype gear-need 28 parts, sub assemblies and machines (ASRs-KSRs-ROs-TDs-etc.). Also need some Model 15s, TUs or what you have. M. Geisler, 8926 Kester Ave., Van Nuys, Calif. 91402. Phone (213) 892-0685.

MODEL 14 TDs FOR SALE, with sync motors - end of tape sensing, tight tape levers. Specify 65 or 75WPM. New; $37.00 Good Used; $20.00. FOB Detroit, Mich. Satisfaction guaranteed. Keith Petersen, W8SDZ, 1418 Genesee, Royal Oak, Mich. 48073.

COMPLETE COLLINS STATION For Sale. 75S-C receiver with 2.1 & 1500 cps plug-in filters. 32S3 transmitter; 30S1 RF linear amplifier, (only 3 hours operation); 312B station control, Model 19 set complete (black and excellent condition); W6NRM Mark 4 converter; 516FZ power supply. All equipment in excellent operating condition and looks like new, both inside and out. All factory modifications installed where necessary. Total price $3,000. Will consider reasonable down payment with balance at approximately $50. per month with 5% interest. W6FHY, Harvey Renfeldt, 2907 W. 141st St. Gardena, Cal. 90249. Phone - Home - 213-323-7428, Days - 213-776-2200.

FOR SALE- MODEL 28KSR with T/R function on bell and auxiliary function on upper case H, $300. Collins 75S2- with RTTY crystals, $275. W3BKY. 1681 Bellemead Dr., Altoona, Pa. 16602.

FOR SALE 255A Polar relays $2.50 PPD. 255A sockets $1.00 PPD. RTTY Magazines May 1964 to Dec. 1966. 14 TD $35.00 200 mill supplys $8.00. Send for list. K8CRE, Richville, Mich. 48758

Additional Classified Ads.
See Page 16