Handling Springs - The Easy Way --

RTTY JOURNAL

Doug Frede
8886 Outer Drive East
Detroit, Mich.

Lives there an RTTY-er with soul so dead, who never to himself has said, "QWERTYUIOP!" when trying to replace a missing spring on a Skokie Slot Machine..

Seriously, proper tools make any job easy and there is available a very handy assortment of "Spring Hooks" designed for the easy installation and removal of the various springs found in TELETYPE and similar equipment.

It is of interest to the RTTY fraternity that a complete assortment of these hooks can be made very easily and at essentially no cost.

The procedure is simple; prepare several pieces of coat hanger wire eight inches in length. Bend a handle at one end of each piece as shown in fig. A.

Find a friend with a light grinding wheel and shape the opposite ends as shown in fig. B.

Heat the sharpened end in a gas flame (kitchen stove or propane torch) and while still red form with slim nose pliers into the various shapes shown in fig. C.
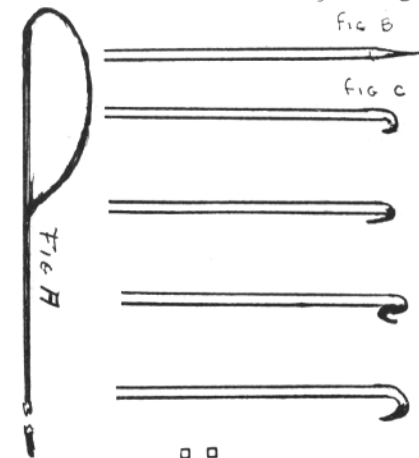
Finally, reheat and dunk in oil or cold water to harden. You may want to leave one or more of them as straight points to use as locating pins or scribes. The peculiar "S" shaped end results in a "Spring Pusher" and will be very valuable in those hard-to-reach places. As a matter of practice you will find it possible to set springs in spots that would otherwise require disassembly of the unit.
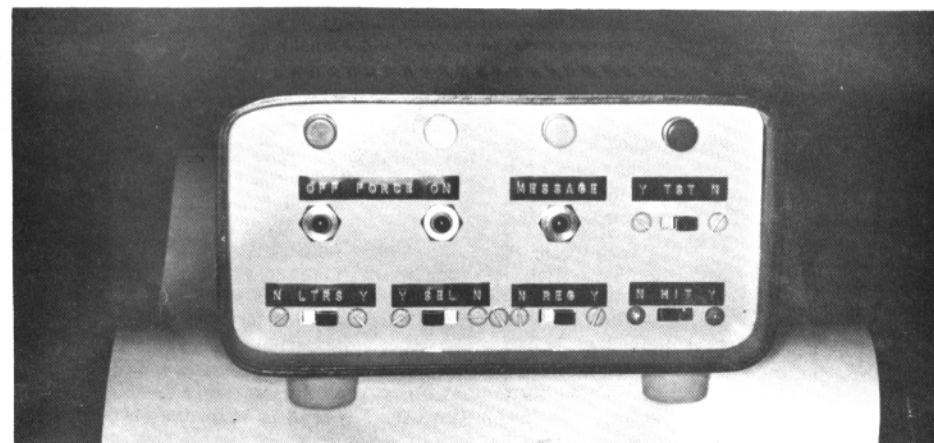
Good Luck . , . . Doug,

First Class Mail

RTTY JOURNAL

W6AEE Receives Dual Award - See page 7

Col. Mark Brennan   Merrill Swan, W6AEE   Maurice Schmitz, K6GJY

SELCAL - AN RTTY coded Auto Start - See page 2

Selcal * *
An RTTY Character Recognizer

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

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

THE SELCAL
An RTTY Character Recognizer

The Selcal is an advanced form of autostart that will turn on your printer when your call is received, and turn it off with the disconnect NNNN.

Part 1 of this article describes the system and gives a very simplified view of its logic operation. Part 2 will discuss the details of construction, adjustment, operation and use.

The Selcal is sort of an electronic stunt box. It receives RTTY characters directly from the loop, with no machinery running. It recognizes four (or more) characters, in the proper sequence. An output relay closes to turn on your printer or other device. It then recognizes receipt of four letters "N", sent at the message end, to turn off your printer. While the characters must be received in the proper sequence, the Selcal does not distinguish between upper and lower case. Fig. 1 shows how the Selcal is hooked up.

The basic system is very versatile, and can be expanded to include a universal call, such as QST. It will be the basis of further RTTY logic systems such as regeneration, series-to-parallel conversion, and speed conversion.

The system is digital, using inexpensive Motorola integrated circuit (IC) logic blocks. This logic is designed to operate in practically any combination, with voltages, switching times, etc., figured out for you, eliminating much circuitry detail. Best of all, they work! Their cost is far below even junk box prices.

LOGIC

The Selcal is built entirely of three types of logic. Each will be described to allow the reader to follow the Selcal operation. See the references (Part 2) for more information on logic. This logic series operates on two voltage states. High (H) voltages - over .8 - will turn

on any gate; Low (L) voltages - under .43 - insure all gates are off. Levels between .43 and .8 would give erratic operation and are not used. The logic symbols that follow do not show the Ḃ (3.6v) and ground connections.

INVERTERS

The simplest type of logic is the inverter, shown in fig. 2. This is just a resistance coupled amplifier designed so that in the "on" state the output is less than .43 volts. The inverter has a small "logic gain," or fanout, meaning one stage will drive several succeeding stages. A buffer is similar to an inverter but has a greater fanout capacity, and is available in both inverting and non-inverting circuits. The MC789P Hex Inverter contains six independent inverter stages for only $1.08.

NAND GATE

The next logic type used is the nand gate, shown in fig. 3. It is obvious that if any input is high, a transistor will be saturated and the common output will be low. Only if all inputs are low can the output be high. The nand gate is a most universal function, and nearly all digital computer circuits and systems can be built from combinations of this logic type. In the Selcal we will use the nand gate as a coincidence recognizer. With varying high and low signals on all inputs, only at the instant all are low will there be an output.

The J-K is an unusual but most versatile type of FF used in modern digital systems. It is also called a "master-slave," or "clocked" flip-flop. Its symbol and operation table are shown in fig. 4A. The inputs are: Set (S), Clear (C), (sometimes called the J and K inputs), Toggle or Trigger (T), and Preset (P). The outputs are (1) and (0), sometimes designated as (Q) and (Q̄). These outputs are always in opposite logic states; that is, when one is high the other is low. The preset function is not shown in the truth table. When the (P) lead is high, the (1) output is forced low, regardless of the states of

the other inputs. While the integrated circuit J-K contains the equivalent of 15 transistors, two independent circuits are contained in the MC790P for only $2.00.

The J-K can be connected for several different logic functions. Fig. 4B shows the J-K used as a common binary counter, or divide-by-two circuit. This divider will be used to count down the oscillator frequency in the Selcal.

Fig. 4C shows the J-K used as a set-reset FF. A pulse on lead (T) causes the device to flip, forcing (1) to high. A second pulse on (P) resets or flops the J-K, restoring (1) to low. This configuration will be used to operate the output relay of the Selcal.

Fig. 4D shows the clocked flip-flop operation. For this use the (S) and (C) inputs must be in opposite states, so an inverter is used as shown. The output logic states duplicate the input states after the clock pulse. This FF is seen to be timed, or "clocked." It will be used in this mode in the Selcal Shift Register. The truth table in fig. 4A shows all modes of operation.
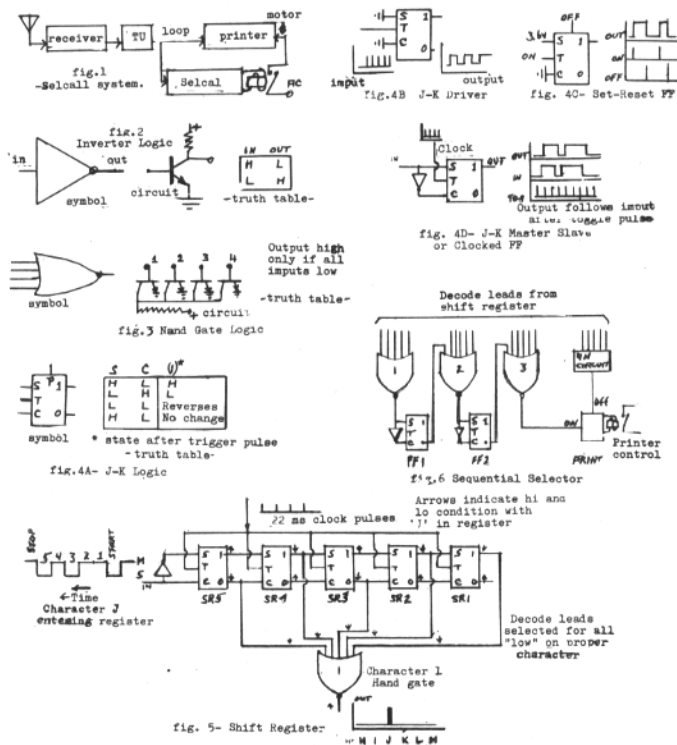
OPERATION

This explanation is not strictly accurate, but presents the Selcal operation in a way most easily understood. The exact operation is given in Part 2 of this article.

The Selcal is basically a series-to-parallel converter. The five character information pulses, mark of space, are briefly stored in a five stage shift register. The desired character is recognized by a coincidence circuit. The state of recognition is stored in a flip-flop. When all four characters have been received, the output relay is closed.

Figure 5A shows the operation of the shift register (SR). Five J-K flip-flops are used, one for each of the five character pulses. The start and stop pulses are not part of the character information and are not retained. A timing system generates clock pulses that occur at the center of each character pulse, similar to the selection interval in a printer selector magnet system.

Lets see how the register stores the letter J, which is: Start-M-M-S-M-S-

fig.1 -Selcall system.

fig.2 Inverter Logic

fig.3 Nand Gate Logic

fig.4A- J-K Logic

fig.4B J-K Driver

fig. 4C- Set-Reset FF

fig. 4D- J-K Master Slave or Clocked FF

fig.6 Sequential Selector

fig. 5- Shift Register

Homemade

Tape Handling Equipment

By James Sayer, VP9BY
PO Box 73
Devonshire, Bermuda

Once the RTTY enthusiast has uncrated his 'pride and joy' and perhaps spent sleepless nights mastering the jungle of terminal strips, wires, levers and gears to get it printing - one problem seems to remain with him over the years. "What do I do with the miles of paper and tape?" Very few machines I dare say, come in such completeness as to include paper winders and tape handling equipment with them, and yet these simple devices make life so much easier for the keyboard operator. One answer would be to try and locate the various parts needed, manufactured by the company from whom the original machine was issued. However it is the purpose of this article to show some 'home brew' methods that will work equally as well and with a lot less outlay of cash.

Since not all RTTY stations are fortunate enough to have tape equipment, lets start with the page copy winder. This unit, properly designed and constructed, will eliminate the normal 'pile up' at the back of the machine and can be used to reverse wind the paper in order that the remaining unused surface can be re-inserted into the machine, thus providing a bonus roll! Of course if certain copy is to be retained for future reference, then this may not appeal, but at this station use of the re-perforator is made under such circumstances. While the idea is probably not new to many, it will provide thought and possible modification for those who want an inexpensive paper winder.

The heart of the winder is a barbeque motor. This provides an economical solution in as much as they are relatively cheap even if purchased new, but at this shack a motor far outlived the unit it was intended for. The motor operates from the mains and has a very slow output shaft speed, however because of the large reduction gears the torque of these motors is far more than required, and a slip clutch arrangement must be used in order that the motor can continuously turn, yet wind the paper with a certain amount of tension. The original barbecue spit is used as the main drive shaft from the motor socket as it is designed to incorporate a square shaft. The hub for winding the page copy on, is made from a discarded center of a previously used roll of paper and this is packed very lightly with old sponges - the shaft is simply inserted through the sponges keeping it as close as possible to the center of the tube, and two end retaining discs are glued to each end of the hub. Mounting the unit is not difficult if "L" shaped brackets are made out of scrap and shaft bearings inserted in them to allow the shaft to turn freely. As long as the roll being wound is placed directly behind the machine where the paper would normally fall it will provide an excellent winder. Another idea, should the slip clutch arrangement not appeal, would be the use of another paper sensing bar which would activate a micro-switch to turn the motor on whenever the paper is slack. However the constant on-off action might produce electrical interference in the TU, in which case some form of filter would be necessary.

Now to the tape winder. This is of the high speed type and employs the use of a discarded sewing machine motor. Many repair shops that deal in trade-ins will be glad to part with these at ridiculous prices, and because they often include a foot control to govern the speed, they make an ideal unit. The take up reel used here is a standard 16mm film reel with one side flange removed. The hub is 2 1/2" in diam and the flange being 7" diameter. The use of the popular plastic variety will result in easy conversion, and result in a light weight unit that is smooth and prevents binding. The center hole is modified to accomodate a shaft coupling, simply by drilling two access holes in the hub for the fixing screws, and heating and inserting the coupling into the center. In my installation I have mounted the motor on the inside wall of the model 19 table directly below the TD, the tape winding reel being placed on the outside wall of the table. To wind a tape after running it through the TD is a simple matter. Just make one or two turns lightly around the hub with the tape and press the foot control, guiding and tape tension being controlled by two free hands!

On the subject of tape un-winders, one has the choice of either a normal or center un-winder. Depending on which of these two you prefer, you either wind the start, or the end of tape onto the hub first, with the unit mentioned above. The unwinder is perhaps the simplest to construct bearing in mind these facts: The hub of the unwinder should be smaller than that of the winder. This is in order that the wound roll of tape will easily slip over it, and the center "start" of the tape can be easily grasped to thread into the TD for running. The top of the hub should have a bulge to prevent the tape from being pulled off the top of the center hub as it is being run. Also you will need a tape guide to ensure that the pull is at the correct angle from the roll. My unwinder again uses a plastic 16mm film reel with one flange removed. This time the hub is 1 1/4" diameter and the flange size 5". These are the rough dimensions of a 200' capacity reel. The hub is doubled in length by gluing another one on top, and the center hole is then filled with a wood dowel. The top of the hub is drilled with four holes at 90 and a stiff wire bulge is formed and the ends of the wire inserted in these holes. The dowel center is drilled to accept an old knitting needle that acts as a pivot for the reel, and half of the original reel container makes an excellent tray to prevent spillage as the tape tends to unwind from the outer edge. The tape guide if made from coat-hanger wire, can be bent into any configuration needed and the entire assembly placed on a relatively heavy base.

I have installed my tape center-unwinder by placing it on the floor next to the operators feet, and feed the tape through one guide and then directly up through the hole between the punch and the TD. Plastic reels of the 200' and 400' capacity I am sure can be obtained from various photo outlets and although they will not accomodate the regular 11/16th tape as they are, with one flange removed they are excellent for the above uses.

Aside from the many lengthy tapes that require the above type of equipment to handle, there are certain to be as many, if not more, of the short variety. For this I have solved the problem by using clothespins strung on coathanger wire which is then bent at right angles either end. A shelf is then selected and drilled to push the two ends of the wire into. Various tapes can then be stored in clip-board fashion quickly and easily, and the pins themselves can be labelled with what they hold. Once a system is developed for the handling of these various items, the operator no longer feels a slave to his machine. Happy operating!
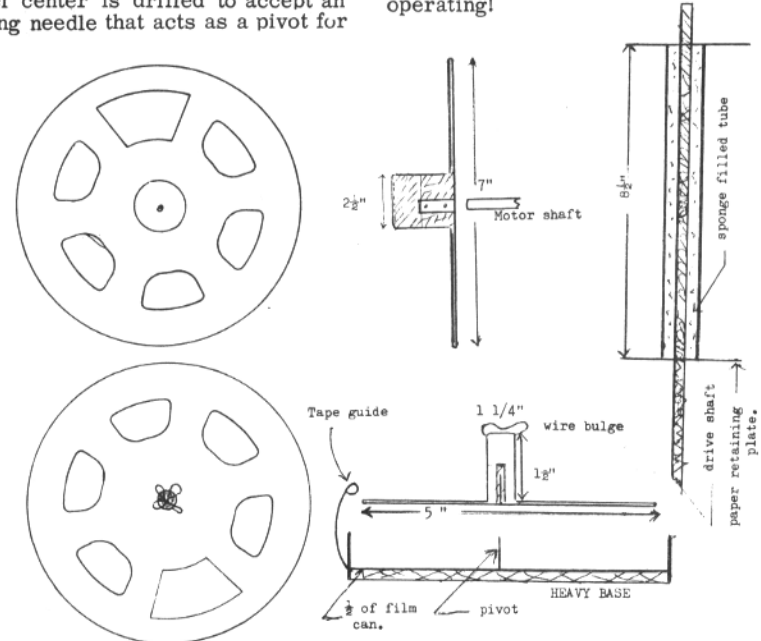
ARMED SERVICE DAY

This year's program will be conducted on Saturday, May 20, 1967 and all licensed radio amateurs are encouraged to participate.

Special QSL cards confirming crossband communications will be forwarded to those amateurs who establish two-way contact with participating military stations. Certificates will be awarded to those who aptly demonstrate their operating ability and technical skill by receiving a perfect copy of the Secretary of Defense originated "CW" and/or "RTTY" message(s) transmitted during the receiving contest portion of the communication tests. Interception by short wave listeners (SWL) will not qualify for a QSL card in confirmation of crossband communications. However, anyone who has the equipment and abilities may copy the Secretary of Defense messages and receive a certificate.

MILITARY TO AMATEUR CROSSBAND TEST

Military radio stations WAR, NSS, NPG and AIR will be on the air from 1400 GMT to 0245Z GMT. During this test of crossband operations, the military stations will transmit on specified military frequencies while amateur stations will transmit in the indicated portions of the amateur bands. Contacts will consist of a brief exchange of locations and signal reports. No traffic handling will be permitted.

STATION	MILITARY FREQUENCY	EMISSION	AMATEUR BAND
NSS (Navy Radio Wash., D.C.)	KCS unless otherwise noted 4012.5	RTTY	3.60-3.65
	7380	RTTY	7.0-7.05 7.1-7.15 14.05-14.10
	*143820	AFSK RTTY	144.0- 145.5

*Provided it is consistent with operational and training commitments, this frequency will be keyed from a U.S Navy aircraft flying between Washington, D.C. and Boston, Mas achusetts.

NPG (Navy Radio San Francisco)	4001.5	RTTY	3.65-3.8
	7332	RTTY	7.0-7.2
	* *148.410 (MCS)	AM/ FM/ AFSK	144-148

**Provided it is consistent with operational and training commitments, this frequency will be keyed from a U.S. Navy aircraft flying between San Diego and Seattle.

AIR (Air Force Radio Wash., D.C.)	3347	RTTY	3.5-3.8
	7315	RTTY	7.0-7.2

RTTY RECEIVING CONTEST

A radioteletypewriter "RTTY" receiving contest will be conducted for any individual amateur or station possessing the required equipment. This is a test of the operator's technical skill in aligning and adjusting his equipment, and serves to demonstrate the growing number of amateurs becoming skilled in this method of rapid communications. The "RTTY" broadcast will consist of a special Armed Forces Day message from the Secretary of Defense to all radioteletypewriter enthusiasts. The message will be transmitted at 60 words per minute in accordance with the following schedule:

TIME	STATION	FREQUENCIES
20 May 1967		
0335 GMT	WAR	3347, 6992.5 14405
	NPG	4001.5
	AIR	3397.5, 7315
	A6USA	6997.5
	A5USA	4025
	AG6EA	4580, 7332
	AG3HQ	4590, 7540

SUBMISSION OF COMPETITION ENTRIES

Transcriptions should be submitted "as received." No attempt should be made to correct possible transmission errors.

Time, frequency and call sign of the station copied as well as the name, call sign (if any) and address of the individual submitting the entry must be indicated on the page containing the text. Each year a large number of perfect copies are received with insufficient information, thereby precluding the issuance of a certificate.

Completed entries should be submitted to the Armed Forces Day Contest, Room 5A522, The Pentagon, Washington, D.C. 20315 and postmarked no later than 31 May 1967.   *   *

At the Southern California Mars Open House held at Fort MacArthur on 25 February 1967, Merrill Swan, W6AEE was honored with two awards.

The first was an "OUTSTANDING CIVILIAN SERVICE" medal and citation presented by the Fort MacArthur Post Commander, Col. Mark Brennan on behalf of Lt. Gen. J.L. Richardson, Commander of Sixth U.S. Army.

The citation, bearing a reproduction of the Medal with the legend "Department Of The Army" directly underneath read:

Mr. Merrill L. Swan is awarded the Outstanding Civilian Service Medal. Citation: For meritorious service during the period December 1953 to December 1966 as an active amateur radio operator and member of the Sixth United States Army Military Affiliated Radio System (U.S. Army MARS), Mr. Swan displayed exceptional professional knowledge and diligence through his valuable contributions to the art of radio-teletype transmission and its specific application to the Military Affiliate Radio System. Mr. Swan's personal efforts in the area of electronics and radio engineering were highly responsible for the introduction of Amateur Radioteletype Transmission throughout the post-war years and for the effective training of Mars members in its use. Mr. Swan's unflagging zeal and extensive performance have resulted in providing the Sixth U.S. Army with a highly efficient reserve of auxiliary means of immediately available communication and personnel for the use during a military or civil emergency. Mr. Swan's more than fourteen years of brilliant continuous service, coupled with his outstanding individual achievements, earned the highest admiration of his peers and reflect great credit upon himself, the Sixth United States Army Military Affiliate Radio System, and The United States of America. Signed: J.L. Richardson, Lieutenant. General, U.S. Army, Commanding Sixth U.S. Army.

The second honor was a plaque presented to Merrill by Maurie Schmitz, W6GJY, on behalf of the Southern California MARS Members.

The plaque, mounted on a wood back, was surmounted by the MARS Emblem in full color enclosed by a Laurel Wreath. The plaque was engraved:

Military Affiliate Radio System, U.S. Army. Presented in recognition and appreciation of Merrill L. Swan, W6AEE-A6AEE, for pioneering amateur and MARS Radio Teletype; for his enthusiasm, devotion and integrity which have attracted many amateurs to RTTY; for making available technical help, equipment and encouragement to all teletypers; for ceaseless work in behalf of the Southern California RTTY Society and RTTY Magazine; for long and devoted membership in and support of the ARMY MARS PROGRAM. Presented by members of SIXTH U.S. ARMY MARS, SOUTHERN CALIFORNIA, AREA, at their Fort MacArthur open house, 25 February 1967.

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WHAT IS MARS?

The Military Affiliate Radio System (MARS) is an organization of licensed amateur radio operators who are interested in military radio communications.

WHAT DOES MARS DO?

MARS creates interest and furthers training in military communications.

Provides an additional source of trained volunteer radio communication personnel and a system-in-being as an auxiliary means of communication instantly available to military commanders during local or national emergencies.

Provides a volunteer facility for handling personal, third party, moral type traffic between military personnel overseas and parents, relatives, and friends at home.

HOW DOES MARS OPERATE?

MARS member stations meet periodically in scheduled nets on military frequencies outside the amateur bands for the purpose of instruction in the use and modification of military communications equipment, and for the handling -- as an aid to training -- of MARS administrative, third party and, official emergency traffic when called upon by proper authority.

HOW WOULD I BENEFIT?

By receiving a membership certificate authorizing operation on military -- MARS -- frequencies, operating manuals, and operating crystals as available. By receiving on-the-air training in military communications procedures and instruction in the use and modification of military communications equipment.

VHF RTTY NEWS

RON GUENTZLER W8BBB Editor

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TERMINAL UNITS

We have recently reviewed some of the literature to find out what has been written on the subject, and have found there is a lot more than we even suspected. Therefore it appears that the best approach is not to sit down and try to develop a new "ultimate" in terminal units. Also, because there are so many types available (see, for example, the bibliography in "HAM-RTTY;" W2NSD/1 and W4RWM, 73 Inc., Peterborough, N.H., 1963, $2.00), it does not appear reasonable to try to evaluate or to build and test all the units available. (We plan to describe a method for evaluation in the near future.)

For FSK or VHF, the prime concern is frequency stability. Crystal control of both receiver and transmitter appears to be mandatory. In addition, AFC should be available. The simplest approach to AFC appears to be an IF converter with AFC built into the converter. If an audio converter is to be used, then the AFC loop must go from the converter back into the receiver. The best overall solution is to use the military CV-57. Admittedly, this is not a construction project. An additional advantage of the IF converter is that it can be used on the HF bands. Also, the more exotic the converter, the better.

For AFSK on VHF, the opposite appears to be true. Because the receiver output audio frequencies are determined by the transmitting stations, it is necessary only to have the receiver and transmitter reasonable stable. Crystals will adequately solve stability problems unless extremes of ambient temperature are encountered and crystal ovens will cure the ambient problem. The only problem normally encountered will be noise. Usually, noise will be white - or colored - Gaussian in its characteristics.

We would like to relate our personal experience with the Twin City T.U. (see Kretzman's "The New RTTY Handbook," for details). When contemplating VHF RTTY operation, it appeared that many of the problems existing on the HF bands (selective fading, QRM, drift, etc.) would not be a problem with AFSK. Therefore, the simplest T.U. appeared to be the best place to start. Tubes appeared to be more suitable than transistors because only three were required and the power supply was no problem with much +130 volts available for the plate supply. Therefore, we built the Twin City (complete with polar relay in the output) and found that we had apparently made a good choice.

We were well pleased with the performance of the Twin City T.U. until one night when a station was heard way down in the noise; the printer could not make any sense out of the signal. Within a week, we had built, tested, and installed a band-pass filter ahead of the TU, as suggested in Kretzman's handbook, and now we no longer have noise problems.

The actual filter used is somewhat different from the one mentioned above. The reason being, we not only wanted a bandpass filter but also wanted a correcting network to undo the severe de-emphasis present in the receiver. The space tone was 4 to 5 db lower than the mark tone as it emerged from the 600-ohm output on the receiver. We plan to discuss the "equalization" of receivers in a future issue.

It appears a very suitable TU for VHF AFSK work would result from a minor reworking of the Twin City TU circuit to use FETs instead of tubes.

So What's New?

Ed Shook, W8ZYW, sent to us part of a recent QSO with Cass, KA9AK. The following is an excerpt: "On the six meter bit I have sked with FG7XT on that band (6) at 2230 to 2400 GMT daily but the beacon is not set up yet and at present we are only monitoring the frequency of 50090 and have decided that the transmitting frequency will be 50205. Would like to get a consensus of what to use in the way of shift. Would like to definitely settle on 50205 as the frequency of operation as the Japanese are quite good six meter hounds and the first two hundred kcs are clobbered and I do mean clobbered. But would like to know whether to set up for FSK or AFSK, would prefer FSK. As we only have an IF type converter at KA9MF where most of the monitoring will be done. . .But main thing is they have both high freq and low freq capability and if they hear the beacon on 50205 kcs call on 29040 kcs and we will get on right away. The best times are the same as 10 meters, sigs peak around 2300 but sometimes are in as late as 2400 but if we could get a couple people interested in six meters operation we will put up a six element yagi here at this station. We now have a 5 element job at KA9MF and monitor every day from 2230 to 2400 pointed northeast and swing south to Australia."

Toledo, Ohio is now represented on two meters. The following stations are auto-start on 146.700 MHz, vertically polarized, with 40F2 modulation: Ed Brown, K8ZCS, and Jerry Coleman, W8HYW. We understand that Jim King, K8DPE, is a RTTYL (or is it SWL-RTTY?); we hope to soon hear his tweedles.

Vic Tresidder, Sr., W9TQ/WA9KHU, sent along the following information: "The following stations 40F2 (or less) near Milwaukee (S/E Wisconsin) on 146.880 Mc -- for reasons given following listing.
W9ATK 50/650W GP/Gain A/S,
W9BTQ 50/300W GP/HZ Beam A/S,
K9CMX 50W GP A/S,
W9CUW 50W GP A/S,
K9DJR 75W Vert/Hz Beams A/S,
W9GIR 25/250W GP/Hz Beam A/S,
W9GPI 50W GP A/S,
WA9GZO ?
WA9HAD 25W GP,
WA9KHU 50W Vert-Col/Hz Beam A/S,
K9HXA ? GP,
W9NY 25W GP/Hz Beam,
W9TQ 25/500W Vert-Col/Hz Beam A/S,
W9YYW 50W GP,
W9ZBM ?,
W9ZPV 50W GP/Hz Beam A/S."

Now for some of Vic's comments: "The 60 Kc separation was accepted for over 10 years and observed." . . . . .

"Locally a quartet in '60 made their own choice on the basis of 30 Kc separation for a voice circuit and chose 146.670 Mc. This bloomed into the local AREC-Red Cross net in '62 and by much work and labor now includes over 60 fixed and mobile units. In addition a repeater link has been established that involves another channel split. When this is operational, a signal on 146.790 Mc is transferred to 440 plus Mc and via that ckt to the repeater out on 146.670 Mc. Repeater is located on high building in downtown Milwaukee and does give substantial coverage of the local region . . . Most of the receivers working in this group are 40F2 broad units.

"The groans and howls heard when 146.700 Mc was picked as the RTTY national spot and our possible use thereof, were fierce."

"Thus the RTTY group began to be viewed as interlopers. Since they already had facilities for .94 contacts and wished to retain such, some discussion as to where or how far to move was indulged in. Contrary to the boasts of some and reported word of unit manufacturers it was not considered best to move too far. . ."

So anyway, that is how Milwaukee ended up with RTTY on 146.880 MHz.

Box Score

Here is the capsule summary of VHF RTTY operation as we have it to date. There have to be more stations on the air and in more cities than we have listed here. How about some more info?

Akron Ohio (146.700, 40F2, Vert) - 1,
Cleveland (146.700, 40F2, Vert) - 5,
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 there it is. 73 ES CUL, RG.

WA8PCK-"Bill" with Selcal

RTTY·DX

JOHN POSSEHL W3KDF Editor

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

Hello there. . .

In these latitudes it was a long hard winter and now that the warm sun and balmy breezes are here again we have a good opportunity to fix those bent beam elements and sagging long wires and get the long neglected outside gear back in shape.

I recently received the latest edition of the BARTG Newsletter and it was a pleasure to read. One item of special interest to you DXers is that there is a DXpedition in the planning for this August. The same group; G3TEY, and G3OHH, that had us all excited last year from Sark may very well be RYing from Jersey this year. We will try to get more specific information on the date in the near future.

Applications received and confirmed for the WAC Award this month are as follows:

Nr. 83	Robert W. Spaith	WA8BOT
Nr. 84	Samuel A. Leslie	W4EGY
Nr. 85	Edwin N. Shook	W8ZYW
Nr. 86	Earl D. Crawfis	W7ATV
Nr. 87	Everett M. Hawley	K8JTT
Nr. 88	Paul Sala	WB6ADY
Nr. 89	Jean Nugues	F8KI

Congratulations gentlemen on a job well done. This is quite an impressive WAC listing for one month and it is interesting to note that all of the above, with one exception, had KA9AK for the Asian entry. Cas' consistant activity is paying off for many of you. One of the recipients waited six years. All his other cards were dated 1961!

Well, band conditions the past month have been somewhat spotty and I noticed almost complete blackouts at times, particularly to Europe. Activity was also somewhat diminished after the contest fracas which I guess is a natural thing. Anyway, let's take a look at what has been going on.

NORTH AMERICA

Dusty sent me a note from two new subscribers to the RTTY Journal, Ken KZ5KR, and Mike KZ5GA, in the Canal Zone. Both these lads indicate that they will be on RTTY soon. Jean, FG7XT, reports a QSO and QSL from KZ5AJ. This is good news as Central America has always been quite rare on RTTY.

Erosa at XE1BI, reports that XE1AY, Miguel is now active. His first QSO was with WA9NHQ and his best DX so far is KH6FOX. Erosa is to be congratulated on the fb job he is doing in getting Mexico established on RTTY. In February he helped Hugh, XE3TTT to get going, and now Miguel.

PJ2MI, SintMaai tinhas been heard back on the air so I guess that Jose has his rig back in shape after the contest blowout.

SOUTH AMERICA

Paul, WB6ADY, sends some additional information on OA8B, after a QSO on March 7. This station is the radio outlet for a scientific group analyzing unwritten languages in the jungles of Peru and reducing these languages to writing. The operator is Paul, OA8V and they are crystal controlled on 21.1 mc. The best time to look for this station is at approximately 1600z after he finishes handling traffic for the group.

YV5CIP has been quite active from Caracas and some of you may remember Franco as YVIEM of previous years. He also maintains schedules with Lou, I1ORS as Franco is an ex Florentine and at one time was I1ANF. The interesting thing about Franco's station is that it is located on one of the upper floors of an apartment house and the antenna is in the garden some distance BELOW the transmitter.

Jose, PY2CQ, has been on twenty meters lately with his usual potent signal. He regrets not being more active but he is quite QRL with work and his activities as President of the LABRE section in Sao Paulo.

It was indicated in a previous column that we could perhaps expect additional RTTY activity from Antartica. This month we are happy to announce the operation of KC4USB from the base at Marie Byrd Land. Les W1ACW, was his first contact, followed by W3ISE, and by this time many more, I'm sure. He has been heard quite consistently on weekends, at about 0100 GMT (Sunday), with very strong signals on the 14 mc. band. You might also try 0600 z as he indicates there is less QRM for him at this time. The operator is usually Elmer and apparently has quite an antenna farm at his disposal. Switchable rhombics no less. QSL cards go to K.W. NOKES, K1TWK, Island Park Road. Ipswich, Mass. SASE please.

Arthur, ON4BX, reports consistent signals from KC4US V from about 0800z on but finds a QSO difficult to come by due to the volume of traffic being handled. Perhaps Walt, W7ARS could give us some "ground rules" to follow in trying for a contact with KC4USV.

EUROPE

As always, there has been a good bit of activity with new stations showing up all the time. A few of the stations that had not been previously heard were DJ9EZA, DJ5WU, F5AZ/P, F2DM, I1JOE, SM4GL, SM1BXJ, OZ2JC, and OE2MHL/2.

Les, W1ACW, reports contacts with OZ7T and F8KW.

After a few months absence, Serge, I1AHN, and Josef, DJ6ZBA have been back on the band with their usual terrific signal. Serge has also been heard using narrow shift. At various times F3PI, and ON4BX, have been heard using this mode also. It certainly is a revelation to see the tremendous improvement in copy when the DX station is using narrow shift, particularly on a cluttered up band like 14 mc. I think that Earl, W7ATV, summed it up pretty well when he said that using wide shift is like sticking with spark when c.w. is available. We are getting a little out of context here, but getting on narrow is well worth the effort.

K8JTT reports that Olle, SM0KV has been putting in a tremendous signal on Ten meters. Olle is a QRP station and it shows what low power can do on Ten when the band is open.

Here is an exciting bit of news. Paul, WB6ADY, reports a QSO with LZ1CC back in October, and now has received the QSL to confirm it. Paul was his first "W" station on RTTY.

This is indeed a rare one.

AFRICA

Am sorry to report that there is not too much activity from this continent this month. Orbra, EL2F has been active as is Alban, 5T5AD, but to date no additional activity has been indicated.

OCEANIA

ON4BX reports a QSO with KH6EDW for his first from Hawaii. Eric, VK3KF, and Noel, VK3NR are quite consistent to these parts via short path at about 12-1300z. It is almost unbelieveable how loud their signals are at times. Eric is set up for narrow shift and can usually be found in QSO with W1WL and K5PJB in this mode. Noel is working on some narrow shift filters so should be using them soon. As we go into Spring and Summer the long path possibilities with VK seem to diminish at these latitudes.

The BARTG Newsletter indicates potential activity from New Zealand with the following stations having machines. ZL3WY, ZL2AFE, ZL3RJ, ZL3VP, ZL3RW. It is understood that ZL4RJ is providing test signals for the others until they get going. That's quite an impressive line-up of RTTY from down-under.

ASIA

Cas is still holding the fort in this area from KA9AK. During the week and with conditions permitting Cas is active from 2145z until 2225z on about 29040 kc. Adolfo, LU8DR has had several contacts and the path is quite long between Japan and Argentina; something like 12,000 miles.

Before winding up for this month I would like to bring one or two more items to your attention.

First, I would like to mention that the CARTG has set the date of October 14-16 for the 7th World Wide RTTY Sweepstakes, sponsored this year by the CARTG as a Centennial Project. The Volta scoring system will be used with some slight variations for added incentive. Some of the top scorers will receive very attractive. awards commemorating the event. Wide spread publicity will be forthcoming but mark your calendar NOW!!!

Next month we will again feature the DX Honor Roll listing. Please send me your numerical list of countries worked and countries confirmed. I already have some upward revisions from some of the gang but we would like to have a nice long listing this time. So send me your list, send me your list, send me your list, send me your list. . . .click.

Sorry I missed you fellows at Dayton but just couldn't make it this time. Bet you had a ball.

73 de John

* *

Anybody need IRCs, ?? - As a courtesy to some foreign subscribers who have difficulty in sending money out of their country we have accepted IRC coupons for subscriptions. We will be happy to sell these for 10¢ each, as long as we have them in stock. You save a nickel, we get some cash and the foreign station gets the magazine that he otherwise might not be able to have. (Then you work the dx station, send him an IRC for a QSL and next year we get the IRC back for a renewal, pretty clever eh. . .)

□ □

The Dayton Hamfest attracted a large crowd as usual. About 150 attended the RTTY forum and heard talks by Ron Larson of the Teletype Corp. on "Present and Future Equipment from Teletype Corp." (looks as we may have to get the FCC to allow 2400 WPM equipment, so practice your typing speed). Tom Lamb, K8ERV talked about the Selcal (see this issue) and Keith Petersen, W8SDZ answered questions on the TT/L converter and AFSK modifications. Two remarkable things happened, the writer made the RTTY meeting at nine in the morning (crack of dawn to us) and although the Kool Ade ran freely the night before we actually had to bring some home with us because of the many contributors. A bound volume of 1966 RTTY magazine donated by Merrill W6AEE was awarded to the youngest RTTY present at the forum.

The talks on RTTY were recorded and we will be pleased to send a copy to anyone furnishing a blank reel of tape. 1200 ft. at 3-3/4 speed, plus 30¢ postage and handling.

□ □

A model 28 machine may be mechanically programed to start and stop on certain selective codes. Unfortunately not many of these machines are available and a number of ideas for selective call-up on any machine became the center of attention on the 80 meter Auto-start net. Bill, WA8PCK, a computer engineer finally came up with the answer using integrated circuits. With the help of several others in building and testing models the final version is described in this issue by K8ERV who was one of the first to finish a working model.

This months article describes some of the theory of operation. Next month will give construction details and operation. If you are impatient to get started we strongly suggest the use of circuit boards. A printed board for this Selcal may be obtained from Harold Quinn, KØOJV, 6605 Mardel St., St. Louis, Mo. 63109. The cost will save a lot of wiring and includes parts list and directions. The integrated circuits cost about $35.00.

コ □

We have planned on having a couple of demodulators in this issue, with the Selcal article and several others not planned on appearing this month we have put off the TUs for another month.

□ □

The ice and snow have finally disappeared from our back yard and by the time this is in print we hope to have our beam up and renew old friendships on the higher frequencies. We enjoy some DX and hearing of all the new countries on from Johns column it has been hard not to be able to be in the pile ups.

□ □ □

SELCAL----

Stop. The first logic level seen by the register is the Start pulse, a space. This (L) input is inverted to a (H) and applied to SR 5 lead (S). After the clock pulse, the (1) output also becomes (H), which we will define as the Space condition of the flip-flop. The next signal pulse (one), is a Mark, which makes SR 5 lead (S) low. The next clock pulse now does two things. At this point SR 4 sees the Space condition of SR 5 and duplicates its output, making SR 4 (1) low. The start pulse has been passed from SR 5 to SR 4. Also the output (1) of SR 5 is changed to high, following the input signal. At the next clock pulse, the input is a Mark (pulse 2). After this clock, SR 5 and SR 4 are in a Mark condition, SR 3 in a Space. The Shift Register

now contains the Start and first two information pulses of the letter J. These pulses continue to enter the Register from the left. Finally the Start pulse is pushed out the right end of the Register, which then contains all of the five J information pulses.

Since both (H) and (L) outputs are available from each SR stage, we can select that lead of each SR that is low for a J. Only for this J (upper or lower case) will the all low coincidence exist. These selected low outputs are now fed into a nand gate. Recall that the output of a nand gate goes high only when all inputs are low. It is the nand gate that actually recognizes the J. The high pulse output is fed into a character 1 FF, that flips and thus remembers that the J has been received. See Fig. 6. To detect the next call letter, say K, another nand gate is, independently connected to the SR outputs that will give all lows with a K. The output of the character 1 FF feeds a low to the character 2 nand gate so that the first character must be received before the second gate may look for its letter.

This prevents the Selcal from responding to your call letters in an incorrect order.

When both the J and K have been received, the third nand gate is free to look for the third letter, say L. When received, the third gate gives a high output which turns on the print FF and the print relay. The printer is now on and receives your message.

To turn your machine off, the sender ends the message with "NNNN." The letter N is recognized just like the J, with a properly connected nand gate. The gate feeds a two stage binary counter which turns off the print FF when four N's are received.

While the actual operation, to be described in Part 2 is a bit more complicated, if you have followed Part 1, you can easily build and operate the Selcal. The authors will be glad to help you to get started. Give a call on exactly 3 6375 mcs. 170 shift.

end part 1

*   *   *

Model 19 Transistorized Punch Magnet driver.

By – Ron Renaud – W8FEU
9150 Texas Court
Livonia, Mich.

The enclosed circuit is one I have been using for some time on my model 19, and may be of interest to anyone having trouble with electrical noise from the tape punch, or wishes to eliminate the large D C supply normally used.

The transistors are type 2N1212 and all diodes are any having a rating of 3 Amps, 200 V. Both are available from "Poly-Paks" or other sources advertising in "QST" and other magazines. The transformer can be any that will supply 35-40 volts at no load and furnish a peak current of 1.5 amps. The

one used here is rated at 26.5 V and .6 A and does very well under the intermittent load. The transistors and diodes are mounted on (and insulated from) a piece of 1/16 aluminum about 2"X7" which can be placed on the machines base behind the typing unit.

To install this transistorized magnet driver, begin by stripping the keyboard, punch, and counter of all wires except the two from the distributor to the connector. Each pair of coils MUST be wired in parallel aiding, then complete the wiring as in the diagram. Before testing a few minutes spent in checking the diode and transistor connections will insure long life for all components.

POWER SUPPLY
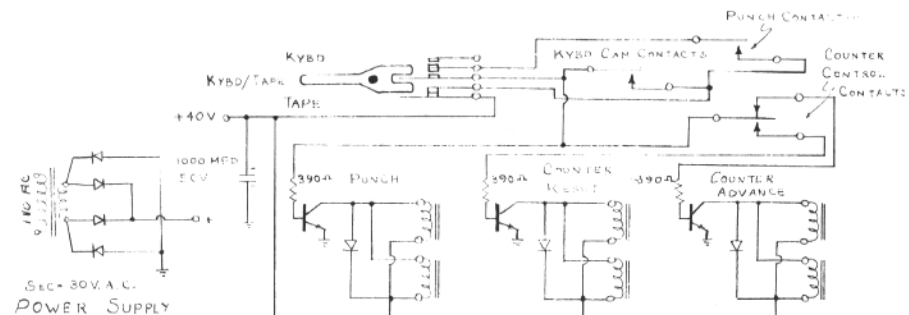
RTTY
READY READER

by W6LIP

Perhaps you are like me and not so fortunate as to have the letters printed on "TAPE" that has been punched. In which case, whenever I want to identify a character, I have to thumb through symbols until I can find a match. This table makes it much easier as far as I am concerned. All I do is note the position of the holes that are punched out, in the same manner that I remember terminal strips which have wires connected to them. Then refer to the easy grouping: I.E. All holes starting with the first position are listed with the possible following combinations. Likewise the second and third, fourth and fifth. Try it and see how fast it is.

To Find character note hole/s punched beginning with:			Carriage return	4 45 O 9 5 T 5
Lower Case	Upper Case			
1	E	3	ALPHABETICALLY	
12	A	-	ARRANGED	
123	U	7		
1234	K	(	A	- 12
12345	letters		B	? 145
1235	Q	1	C	: 234
124	J	' ,	D	$ 14
1245	figures *		E	3 1
125	W	2	F	! 134
13	S		G	& 245
134	F	!	H	35
1345	X	/	I	8 23
135	Y	6	J	' 124
14	D	$	K	(1234
145	B	?	L	) 25
15	Z	"	M	. 345
2	line feed		N	. 34
23	I	8	O	9 45
234	C	:	P	O 235
2345	V		Q	1 1235
235	P	O	R	4 24
24	R	4	S	13
245	G	&	T	5 5
25	L	)	U	7 123
3	space		V	2345
34	N	,	W	2 125
345	M	.	X	/ 1345
35	H		Y	6 135
			Z	" 15

* Check to see if "Figures" precede to denote upper case.

14

WHAT IS MARS? Continued from page 7

By becoming eligible for selected electronic courses offered by the U.S. Army Signal School, U.S. Navy Correspondence Course Center and the U.S. Air Force Institute upon completion of 6 months active membership.

By receiving, after 6 months active membership, excess and obsolete electronic communications equipment and supplies for experimentation, modification, and cannibalization. Issue of such items is based on availability of equipment, length of membership, degree of participation, and possible assigned mission of individual activity.

By receiving credits for MARS participation toward retirement in the Reserve Military Program if you are a military reservist.

By receiving a MARS issued certificate to aid in obtaining a military communications assignment upon enlistment in the Armed Forces.

HOW DO I JOIN?

16 years of age or older.

Hold a valid amateur radio license issued by the Federal Communications Commission or other authorized agency outside the jurisdiction of the FCC.

You may join either Army, Navy, or Air Force MARS but you may not join or belong to more than one MARS service branch at the same time.

Write to the Office of Chief Of Mars,
ARMY - Room 5B960 or
NAVY - Room 5D564 or
AIR FORCE - Room 5B543

The Pentagon, Washington 25, D.C. request the address of the Director of the office in your geographical area.

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W8BBB—"RG" Cleveland Heights, All VHF Equipment