Additional Classified on Page 15

SAROC, JANUARY 7-10,1971, Flamingo Hotel Convention Center, Las Vegas, Nevada. Sponsored by Southern Nevada ARC, Inc., Box 73, Boulder City, Nevada. Advance registration $14.50 per person accepted until January 4, regular registration at door, includes Flamingto Hotel Late Show and drinks, Sunday Breakfast, Cocktail Parties, technical seminars and meetings, ARRL, DX, FM. MARS, QCWA, WCARS - 7255, WPSS-3952 and WSSBA Ladies Program. Flamingo Hotel SAROC room rate $12.00 plus room tax,, per night, single or double occupancy January 3 thru 12, 1971. Mail accomodations request to Flamingo Hotel Mail advance registration to SAROC. W7PRM Club President, W7PBV, SAROC Convention Chairman.

THE MAINLINE TT/L-2 FSK demodulator is now available with the tones of 1275/1445/2125 for those who cannot utilize the standard tones because of receiver restrictions. These filters are assembled in vector C-12 cans. The rest of the circuitry is the same as described in May 1969. QST. J & J Electronics, Canterbury, Coan. 06331.

SPECIAL RTTY TEST TAPES: superdurable Mylar, for CQ, "fox" tests, etc., 5-level only, endless loop with any short message - 50¢ - G. White, 5716 N. ,King's Higway, Alexandria, Va. 22303.

SALE: TELEFAX TRANSCEIVER, Western Union type 6509-A, 115 V. 25A1 phase 60 hertz, 5" drum desk model, used, $12.00. each. Two for $22.50. Atlantic Surplus Sales, 580 3rd Avenue, Brooklyn, N.Y. 11215.

TI SN72709N OP AMP $1.75, 7/$10.00. Motorola MC890P/MC790P $2.00. MC724P, MC789P $1.05. Other MRTL including decade counters and decoder/driver in stock. HP-2800 Hot Carrier diodes 90¢ each, 12/$10.00. matched 4/$4.25. Fairchild 900, 914 60¢, 923 90¢. All items new and fully guaranteed. Get our catalog. HAL Devices, Box 365RJ, Urbana, Ill. 61801.

WANTED: TELETYPE Model 28 in working condition at a reasonable price, and good typing reperf with keyboard. Send description and price to: Mac Robbins, WA3KDJ, 339 Vernon Drive., West Newton, Penn. 15089.

RCA DIVERSITY SYSTEM for RTTY, consisting of two CV-57/URR converters and one CV-14/URR comparator in desk top rack. 10 to 1000 cycle shift - trade for R390 receiver or make offer. Boehme keying head and wheatstone perforator for morse code - 0 to over 75 WPM, $175. Boehme ink recorder head, tape puller for morse code, $75. RTTY paper rewind, $15. Heath LCR bridge, $35. Meas. corp. 10-1 - 1mc calibrator, $20. IBM transistor supply 36V at 2 amps, $15. 60 cycle sync motor $5. W6JX, 14945 Dickens St. Sherman Oaks, Cal.91403.

WANTED: MODEL 28 KSR TELEPRINTER cash, trade model 15 or build your linear amplifier. See QST July 1963, CQ July 1969 or your design. You furnish parts. Larry Kleber, K9LKA/W9CPD, Belvidere, Ill. 61008.

FOR SALE: 3 EL BEAM. Gotham tri band, brand new, never used. $45. You pick up or will ship collect. Steve Perry, WB2ESN, RR. Box 21. Rocky Point, N. Y. 11778

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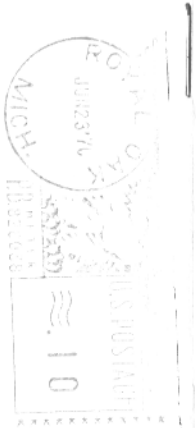

RTTY JOURNAL

JULY-AUGUST 1970

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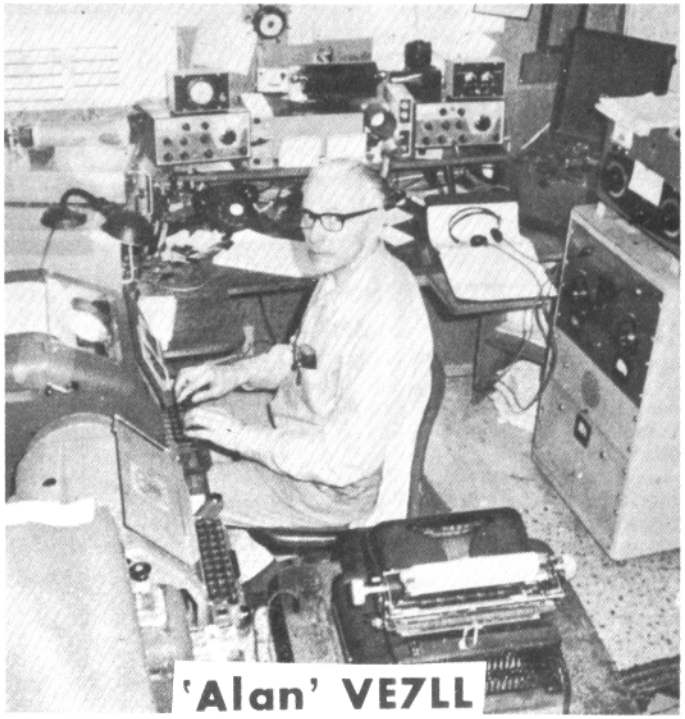
VOLUME 18 Number 7 — 30 Cents



'Alan' VE7LL

Contents-

RESULTS-

1st World RTTY Championship
Based on scores from all RTTY contests in 1969

	STATION	SCORE						
WINNER	ON4BX	77	28	i1EVK	22	55	K2KFV	11
2	SM4CMG	73	29	F5OL	22	56	K8ILL	11
3	W2RUI	60	30	WA2YVK	21	57	W7TZL	11
4	VK2FZ	60	31	iT1ZWS	20	58	HP1XHG	10
5	VE7UBC	46	32	DJ5JK	18	59	OZ6OB	10
6	W3KV	45	33	F9RC	18	60	VK3NR	10
7	i1KPK	44	34	W1JKL	18	61	i1KFL	9
8	W4YG	44	35	W3ABT	17	62	i1RRE	9
9	W9HHX	43	36	VE3RTT	17	63	XE1Yj	9
10	G3MWI	41	37	W2FAN	17	64	YV5AVW	9
11	i1CAC	37	38	W9HHX	17	65	W3IIZ	8
12	DL1VR	34	39	HA5FF	16	66	HB9AKA	6
13	HA5KBF	34	40	SVØWO	16	67	SM5CLW	6
14	DL5PQ	33	41	VE2HL	16	68	DL2QH	5
15	DJ6JC	32	42	VU2KV	16	69	i1CLC	5
16	VK3DM	32	43	WB6QFE	16	70	VE3GSZ	5
17	WA6WGL	32	44	DM3YA	15	71	K7MNZ	5
18	i1CQD	31	45	KG6NAA	15	72	W3DIZ	5
19	i1KG	30	46	PAØGKO	15	73	DL3NO	4
20	i1CGE	28	47	VK6DM	15	74	F3PI	4
21	DLØEL	25	48	WA3HRX	15	75	HB9P	4
22	HA5KFB	23	49	K2LGJ	14	76	SM4CEZ	4
23	i1CWX	25	50	i1PEP	13	77	K4VDM	4
24	W1BZT	23	51	SMØKV	13	78	W6AEE	4
25	W3ILZ	23	52	W3VJP	12	79	W6FFY	4
26	WB6RXM	23	53	W8CQ	12	80	W7RSJ	4
27	DL8VX	22	54	DL8CX	11	81	ZM2ALW	4

***

WINNER

Arther- ON4BX

PLAN NOW!
CARTG DX RTTY SWEEPSTAKES-
October 16-18
FULL DETAILS NEXT ISSUE

RESULTS- 1970 Giant Flash RTTY Contest.

	UNDER 100 W	CALL	SCORE							
1		VK2FZ	62.616	21	6)	HA5KBF	11.704	41	iT1ZWS	1.910
2		ON4BX	54.366	22	7)	K8QLO	10.285	42	DL8CX	1.315
3		W4YG	44.486	23	8)	WB6RXM	7.808	43	HB9P	964
4	1)	WA2YVK	35.000	24		K8ILL	7.740	44	i1ZAN	840
5		DJ6JC	26.581	25		ZM2ALW	7.656	45	W6FFY	652
6		i1CQD	25.194	26		DJ8BT	7.462	46	DM3DD	498
7		i1CAQ	23.144	27		SMØKV	6.342	47	JA1ACB	376
8		SVØWO	21.924	28		WB2JBH	6.330	48	ON5WG	301
9		KG6NAA	20.774	29	9)	W9HHX	5.335	49	DL9YB	220
10		W1KJL	18.606	30		HA5KFB	4.410	50	i1VN	217
11		WA6WGL	18.480	31	10)	K9WJB	3.982	51	G3WQT	168
12	2)	F9RC	17.879	32		WA7GGQ	3.790	52	OZ6OB	80
13	3)	i1EVK	17.100	33		K9BJM	3.400	53	i1LCF	-
14		W1BZT	17.073	34	11)	PI1HRL	3.369			
15		DL1VR	16.416	35	12)	HB9ADM	3.087			
16		i1CWX	15.725	36		WØKXZ	3.069			
17	4)	DL8VX	14.160	37	13)	W6AEE	2.464			
18		VE3GSZ	14.048	38		OK1MP	2.376			
19	5)	PAØGKO	12.020	39	14)	i1CLC	2.169			
20		W3KV	11.808	40	15)	LA6OI	2.076			

Plaques -- Trophys -- Certificates -- CARTG World Wide RTTY Sweepstakes -- Oct. 16-18. Honoring Province of Manitoba. Special awards for Low Power, Ten Meters etc.

An I.C. Regenerative Repeater

Supt. J. A. McElvenney, 7Q7JO
Police Headquarters. PO Box 837
Zomba, Malawi

A well adjusted printer requires that the applied signal has no more than 40% distortion. A regenerative repeater will accept inputs with up to 49% and pass them on with little or no distortion. This is done by sampling the input for a very short period (in this case at the center of each element) and delivering an output that corresponds to the input during the sampling period. The sampling circuit used here is a jk flip-flop that requires a fast negative going pulse to make it change state. The sampling period being a function of the flip-flop and the pulse fall time.

A major cause of errors is machines going out of synchronisation for a few characters due to a dropped stop pulse. This is prevented by the automatic insertion of a stop pulse having a minimum value of 1.3 elements. The actual length being equal to the stop pulse at the input.

CIRCUIT DESCRIPTION

The input (+high for mark and +low for space) is applied through R1 to terminal 3 of ic9 and through the inverter ic10(1) to terminal 1. Thus when the input is high, 3 will be high and 1 low. The reverse happens when the input is low. When a negative going toggle pulse arrives at 2 of ic 9, the flip-flop will decide on the basis of the states of 1 and 3 whether to change state or not.

At the beginning of the start pulse (low) a high from 7 of ic10 is fed to the oscillator control flip-flop ic11. This is made to change state giving a high on 6 which is inverted in ic10(2) and used to turn on the oscillator (Q1,2) via Q3. The oscillator will now stay on, irrespective of changes in the input, untill ic11 is reset by the stop generator after 14 pulses.

The oscillator output, in the form of negative going pulses at twice the baud rate, is fed to 2 of ic1. Ic1 changes state with each pulse and produces an positive going edge at 5 with every second pulse and in coincidence with the center of each element. These edges, after inversion in ic7(1), are used to toggle ic9.

Ic1,2,3,4 and 5 form a divide by 14 circuit. After 14 pulses from the oscillator, terminals 5 of ic2, 3 and 4 will be low causing a high to appear on 6 and 7 of ic5. Ic6, an astable flip-flop with a period of 0.8 elements, is made to change state giving a high at 6. This high is inverted in ic7(2) and used to reset ic1, 2,3,4,9 and 11 through the inverting buffer ic8.

The output will be held at mark during the time it takes ic6 to reset itself. With the next start pulse arriving at the input, the cycle will start again but, it will be noted that, due to the dividing action of ic1, ic9 cannot change state untill the second oscillator pulse. Thus a mark is always present at the output for 0.5 element. It can be seen that this adds to the 0.8 element generated in ic6 to give a minimum stop pulse of 1.3 elements.

A figure higher than this might cause desynchronization if the oscillator were slightly off speed. If the input stop pulse is longer than this, the extra is passed through automatically because the oscillator cannot start until a space is received.

ADJUSTMENTS

Ideally a frequency counter having facilities for period measurement should be used to set up the oscillator and stop generator but a calibrated audio oscillator and an oscilloscope can be used.

With the input shorted and the lead marked with an X (between ic5 and ic6) open, the period of the waveform on 5 of ic1 should be adjusted by the speed control to 20 or 22 mSec. The connection between ic5 and 6 is remade and the counter transferred to the output. The stop length control is now adjusted to give a total period of 146 or 160 mSec. If the counter has facilities for opening the gate on a leading edge and closing on a trailing edge, then the stop pulse may be set to length separately. The above figures have been rounded off. The first one relates to 50 bauds and the second to 45.

Using an audio oscillator and an oscilloscope, the oscillator can be put on frequency by using lissajou's figures. With the output from 5 of ic1 on one set of plates and the audio oscillator on the other,

the speed control is adjusted for a steady pattern. This will be rectangular and somewhat distorted but quite recognizable.

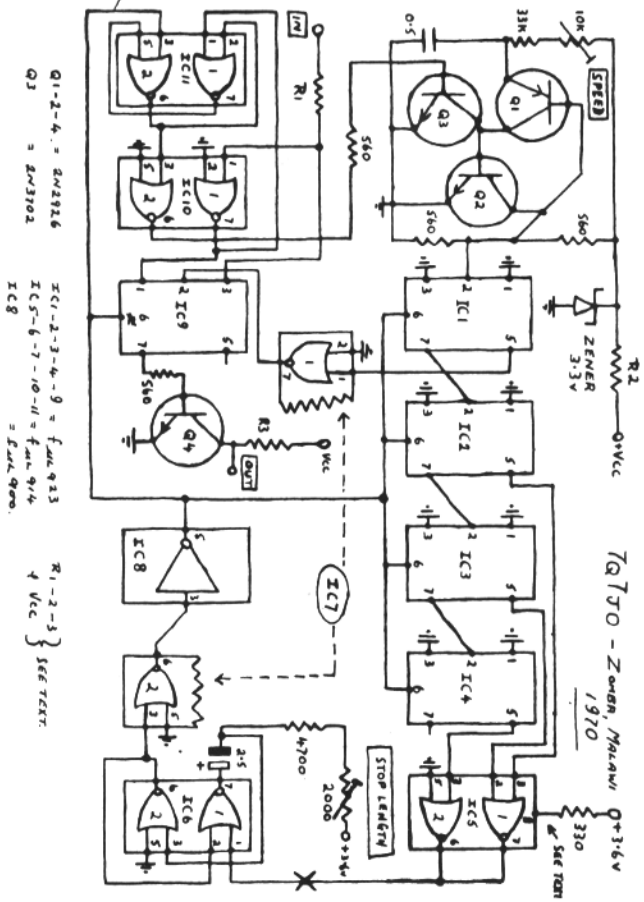
If now the oscilloscope is connected to 7 of ic9 and adjusted for a slow running, untriggered trace, a negative pulse will be observed. This is the stop pulse. It will be noticed that there is a slight step at the bottom. To the left of the step is that part of the stop pulse due to ic6 and to the right that due to the half element at the beginning of a new character. The stop length control is adjusted so that there is a relationship of 8 to 5 between the left and right portions.

When the oscillator is adjusted for 50 bauds and is changed to 45, an extra 1mSec is automatically added to the stop pulse and it will probably be found that no adjustment to the stop length is needed.

The input and output circuits have been purposely left vague because the actual arrangement depends on the particular application. In the writer's case, the unit was strung between Q4 and Q5 of W6FFC's ST-3. R1, R2, R3 and Vcc were 2k, 180, 1.5k and 12 volts respectively.

Single ic's were used but dual packages would make things even smaller. The repeater was constructed on a 5" x 4" board with plenty of room to spare. The cost was about $18. All of the number 4 terminals of the ic's go to the negative side of the supply and all number 8 terminals to the positive with the exception of the one on ic5.

It must be admitted that a repeater is not the most necessary piece of equipment but at least the writer enjoyed himself.



Modifying the Model 28 Teletype

PART 6 Auto. C R - Line feed

Irvin M. Hoff, W6FFC
12130 Foothill Lane
Los Altos Hills, Calif. 94022

The major thing remaining to do to the 28KSR "Mouse" machine is the installation of auto CR-LF. We have been delaying this until now so that we could give you the proper background to understand what would be needed. If you have read the previous five articles, you should now be ready.

AUTO CR-LF

Perhaps before we explain how to install it, we should attempt to tell you just what happens in the typing unit after we do have all the parts installed. This should make their installation somewhat more simple.

Therefore the following explanation jumps the gun insofar as we assume all the parts are already installed:

Looking at the front of the typing unit, a rather large round wheel is seen on the front, toward the right. It is called the "spacing drum" and has notches along the outer circumference. If you get out the Feb. issue (Article 1) and look at Fig. 3, the arrow points to the bellcrank. This has a projection on it. As the spacing drum rotates toward the right margin, this projection collides with the right margin stop on the rear of the spacing drum. This causes the bellcrank to tilt. The top of the bellcrank then causes the "Zero" code bar to be pulled to the right.

Up in the stunt box, in slots 4 and 39, we have some function bars coded so that at anytime this "Zero" code bar is pulled to the right, they can operate on the very next character or function that occurs. As we mentioned in Article 5, anything in slot 4 can operate the line feed mechanism. As a result, whenever the "Zero" code bar is pulled to the right, then on the next character typed or received, the auto CR-LF takes over, and since you have now moved away from the right margin stop, of course the bellcrank returns to normal position, allowing the "Zero" code bar to go back to the left (out).

So there are several things that have to be in the machine to allow all this to happen.

1. A bellcrank is needed with bracket, as shown in Fig. 3.
2. A rear ring is needed on the spacing drum that has the proper projection to collide with the bellcrank bracket.
3. We must have the "Zero" code bar.
4. We need parts in slots 4 and 39.

WHAT DO WE HAVE NOW?

This you shall have to determine. In Article 1, we had you determine part of this already, in order to send for the parts needed. About 75-80% of the machines apparently have "most" of the parts already needed. The other 20-25% need "the works" added.

Back to Article 1 in the Feb. issue. If when looking at Fig. 1 and then checking your machine, you find you have a code bar for the "O" slot, and then after looking at Fig. 2 you determine on your machine that you do have that particular bellcrank, your problem is pretty simple to complete. All you have to do is take the 157514 mod. kit we had you order, and install the little bracket in the "horse's mouth" (shown in Fig. 2) so that you wind up with Fig. 3. THEN YOU ARE DONE WITH EVERYTHING EXCEPT ADDING THE PARTS TO SLOTS 4 AND 39!

If you are one of the 20-25% of fellows who did not find the "O" code bar to be in your machine, and consequently did not find the bellcrank shown in Fig. 2, you will have to wait for some more articles that shall follow this one, in order to add the parts we had you get. In any event, EVERYBODY will need to add the parts to the stunt box, so this article will concentrate on that.

ADDING AUTO CR-LF TO THE STUNT BOX

In Article 4, we had you remove the typing unit, take out the stunt box and exchange function bars 5 and 38 to give automatic non-overline. That was also a "warm-up" to installing the parts needed for auto CR-LF which is a bit more complex.

So, review removing the stunt box in Article 4, if necessary.

Remove the typing unit, remove the stunt box. To make it easier to handle the stunt box, you might as well remove the electrical switch block on the stunt box. It is held in place with two bolts that

go through its top. It won't hurt if the switch falls apart, but it is a little more convenient if it doesn't. You can put some nuts on the bottom of the bolts, or use some Scotch tape to keep it together.

The wires are tied in a channel bracket that runs the length of the stuntbox. At either end, this channel bracket will have a small bolt holding it to the stunt box end piece. Take those little bolts out and then you can pick up the stunt box and it will be free of the electrical wires and from the typing unit. You may now set the typing unit in another part of the room where it will be out of the way.

Fig. 15 shows one end of the stunt box. The arrow points to a thin retaining plate (part 152889) which has to be removed before you can dismantle the stunt box sufficiently to install new parts.

So, take out the bolt just to the right of the arrow in Fig. 15, the retaining plate will slide down and off. You can temporarily replace the bolt to keep the end bracket in position (part 153299). Now go to the rear of the stunt box, and you will see another angle bracket running the length of the stunt box, near the bottom, between the end brackets. (Part 153581). Remove the bolts at either end holding this in place.

Now you can go back to the end bracket and again take the bolt out. Just tug the end bracket clear off, and this will allow the removal of the stripper blade (part 155061) probably, on your unit) and the round shaft (153295). In Fig. 16, these have all been laid out. Two of the three bolts came from the angle bracket at the extreme left, the third from the end bracket at the bottom right.

When you removed the 152889 retaining plate, there was a small rod that probably fell out of the stunt box, or wanted to. This rod had been held in place by the retaining plate, and is shown in Fig. 15 as being in the 10:00 position from the bolts you removed and perhaps a quarter-inch from it. This is the rod that holds the function levers from slipping out of position, but has to be removed in order to install any additional function levers anyway. Don't worry about that rod just now, as you cannot keep it exactly in place anyway without the retaining plate in position.

INSTALLING THE PARTS

You are now ready to start installing the parts in slots 4 and 39. It is not at all hard, and in fact you will find it most interesting.

In this case, a small embroidery hook is all but indispensible. I have several sizes, but find the size "13" to be ideal. Teletype Corp. also has special tools just for this purpose: 142554 which is a small hook (24¢) and the 142555 which is a "double hook" -- that is you can push or pull either one -- (24¢). They also sell what appears to be a no. 12 embroidery hook -- 151959 (16¢).

At any rate, the function pawl goes in first. Refer to Article 5 Fig. 10 -- the "pawl" is at the top of the picture. Since you already have several examples in front of you while looking at the stunt box, just slide the pawl in slot 4, similar to the appearance of the pawl in an adjacent slot such as 5. We originally had you order two sets of slot parts (153916) and the pawl, springs, etc. will be in that package.

There will be three springs and one cotton wick. Take the spring with the "bent-end", stick the wick inside, and hook between the end of the function pawl ("bent end") and the front plate. You can refer to the other function pawls in the stunt box for this.

Next comes the function lever. As it is all but impossible to install the spring AFTER the function lever is in place, put the one end of the spring on the function lever prior to inserting it in the stunt box. This is the shortest spring of the three.

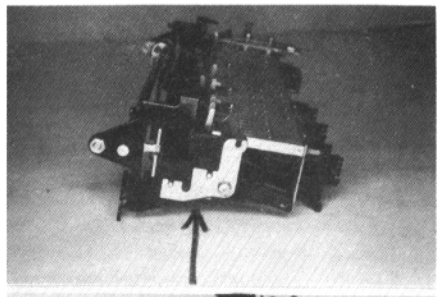
If you can't figure out which side the spring should stick out, look at Fig. 11, and it might give you a better idea. You install the function lever so the open part of the "C" faces the front of the stunt box, so the spring should stick out the "other way".

After the function lever has been wiggled around into place, install the 152660 spring plate similar to those in other nearby slots. After hooking the "tail end" you can then pivot it around until it snaps into place. If you have to push more than moderately hard, you may wish to loosen that bottom rod a little. f you look on the bottom side of the stunt box, you will see several small bolts. These tighten spacers that hold that bottom rod in position. Just loosen the one that is closest to slot 4 temporarily, and this will enable you to easily insert the spring plate properly, then retighten the bottom bolt again.

Now take your hooked tool and engage the other end of the spring on it so that it holds the function lever into place.

Do the same for slot 39.

Now you are nearly finished. You can at this time either reassemble the stunt box or install the function bars in slots 4



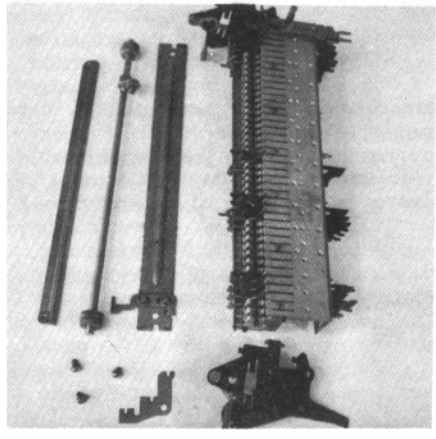


Fig. 15 -- left end of stunt box, showing the retaining plate that holds the small rods in place.

Fig. 16 -- Stunt box disassembled and ready for parts to be installed.

-++

and 39. No matter. Let's install the function bars so we can say we are finished with all the parts themselves.

We had you order two 152671 function bars. These look quite unusual with respect to the "business end" as only one tyne remains, and that is in an unusual position. This one tyne is called the "Zero" level, "non-select". Since the "Zero" code bar is normally "out" or to the left (marking position) these function bars can never do anything unless, until and if that "zero" code bar has first been pulled "in" to the spacing position, which is called "non-select". Then, the 152671 function bars can operate at any time and on any character, since they have no other tynes and thus respond to "anything".

The remaining spring is the longest of the three and retains the function bar. Just shove the function bar in the slot on the front of the stunt box. You may have to push and pull slightly, and you may find it easier if you hold the function pawl up at its rear end to allow the function bar to slip in under it more easily. Hook up the springs and you have finished all the work in the stunt box that we had in mind for this time (installation of auto CR-LF).

This may seem a bit "after the fact" but we hope you read the entire article before you start any actual work in the stunt box anyway.

GET SOME GREASE OR HEAVY OIL (EVEN VASELINE) AND WITH YOUR FINGER, PUT A LIGHT COATING OF GREASE ON THE FUNCTION PAWL, FUNCTION LEVER AND PARTICULARLY ON BOTH SIDES OF THE FUNCTION BAR PRIOR TO INSTALLATION.

REASSEMBLING THE STUNT BOX

Continue to leave the rod out that fell out when you originally removed the retaining plate (152889) from the end bracket (153299) as it will only get in the way at this time. Set the stunt box on end, so that the end from which you removed the retaining plate is in the air. Now place end of the stripper blade in the bottom bracket, making sure the end with the added piece is "up" The stripper blade goes in the slot in the end bracket that is closest to the function levers. Notice at each end of the stripper blade is a small notch. This engages the arm (153301) that is attached to the end of the bracket.

Now install the shaft in the hole in the bottom bracket. You will note that the end of the shaft has an eccentric that engages that hole in a certain way, so that when the shaft is turned, it moves the arm, causing the stripper blade to move.

OK, now take the remaining end bracket and install on the top end. This is not a difficult job if you do it as we suggested, with the stunt box standing on end. You will have to go back and forth between the stripper blade and the shaft until both fall into place, and then you will need to wiggle the end bracket around a bit to get it to position correctly over the rods that stick out the end of the stunt box frame.

Put the bolt in that holds the end bracket on. Now for the time being we will forget all about that other rod that has not been put into place, and we will for the moment forget about the retaining plate on the end.

Continued on page 12

RTTY theory & applications-

RON 'RG' GUENTZLER, W8BBB
Route 1 Box 30
ADA OHIO, 45810

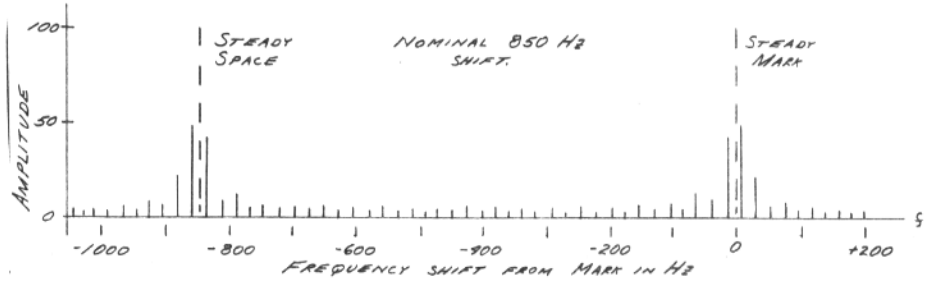
RTTY SIGNAL BANDWIDTH
Part 7 - RSK Signal Spectrum

This series on RTTY signal bandwidth was supposed to be complete with the 1970 April Issue. However, the spectrum diagram was inadvertently omitted. Therefore, a portion of that month's "column" will be repeated here. The spectrum resulting when a square wave (dots) are used to frequency shift a carrier (FSK) is shown in the Figure. The actual numerical values and how they were obtained are given in the April "column".

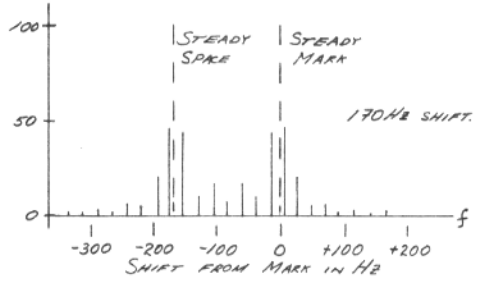
The amplitude of the unmodulated carrier (either steady Mark or steady Space) is taken as 100 units high. The values are voltages (or current), not power. To get the relative power, the values should be squared. The horizontal axis represents the frequency in hertz from the nominal unmodulated (Mark) carrier frequency.

When the signal is modulated, the signal is spread out over quite a range of frequencies. One curious point is that no power is transmitted on the frequencies corresponding with the unmodulated carrier (either steady M or S). However, the energy is concentrated in these regions.

The plots show all sideband frequencies that are 2% or higher (relative to the unmodulated carrier). 2% represents a signal that is approximately 34 dB below the unmodulated carrier power (or, approximately 28 dB below the strongest signal component). The 850 Hz shift actually requires a bandwidth of 1300 Hz (using the 2% limit). The 170 Hz shift requires a bandwith of 500 Hz. Therefore, although the nominal shifts are in a 5:1 ratio, the actual bandwidths are in a 2.6:1 ratio.



SPECTRUM OF FSK SIGNALS WHEN A 45.45 Bd SQUARE WAVE IS USED AS THE MODULATION.



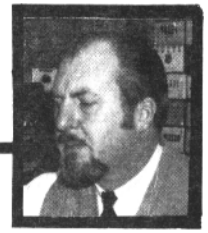
VHF RTTY NEWS

Bob Jeffers, W2ALL, sent the following information about VHF RTTY activity in the Rochester, NY, area. It appears that one of the ex-Cleveland VHFers, Fred Cupp,

Continued on page 13

RTTY-DX

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



Hello there. . . .

With the Contests over until the Fall the RTTY bands seem to have settled down to normal, and by that I mean, not too much activity. Conditions have not helped any either as they have been quite spotty the past month or more with Ten Meters really taking a beating. It is difficult to hear a signal in any mode on that band most of the time. Then too, with the Summer months on hand in these latitudes it seems that the static level is always highest just when you have the time to get on the bands. There are some gems that show up from time to time however and we will try to bring a few to light.

Venkat, VU2KV, is back in business again with a real excellent signal from a temporary antenna set-up. At least he is on again and the Quad will follow shortly to put more sock behind his signal. The European boys have been heard working him at around 18-2000z on week-ends and he has been coming thru the long path at 11-2000z here in the states. This has been on 14 mhz but Venkat will be on 21 mhz whenever the conditions are favorable. His new QTH is . . .

102 Jorbagh
New Delhi, 13 India

Gin, JA1ACB continues activity from Japan and has been coming in here at 11-1200 z most days on 14 and 21 mhz. He has a 75S-3B now for receiving so no more transceive or exact zero beat is necessary. In the coming months, Gin will look into the possibilities for RTTY in 9M2 and XZ2 land. Wow! He has located some additional Model 15 machines which he will overhaul and try to place with hams in these rare countries. On 20 Gin has been printing LU4DA, LU8DR, PY2CBS, KZ5LF and a few other South American stations but they do not seem to hear Gin's "peanut whistle" . He did connect with Bill, HP1XHG recently, which is quite a long haul.

Things are pretty quiet from Africa now that Leo, EL2BD, is QRT. He was trying real hard himself to find an African station so he could make WAC before he left. We sure hope he made it.

Jo at CR6CA was real active in early May on a "one way" only basis. G6JF, myself, and I am sure several others, have had contacts with Jo. He was on CW and printing our RTTY. At that time he still had FSK problems which we assumed would be overcome real soon. W4FPS sent him complete information for his particular exciter so perhaps he is on by the time you read about it. In any event, Jo has been answering RTTY CQ's on CW and 14090 at 2300-0000z from time to time.

That world traveler, Olle, SMØKV, was recently in Belgium and was visiting at the shack of Wilf, ON4HW. It was an enjoyable QSO and it was good to print Wilf again. He does not operate often but he does write very interesting technical articles on these pages from time to time.

Arthur, ON4BX informs us that Jean, ON4RJ will be QRV very soon. He is printing at the moment and FSK will follow shortly. We would also like to congratulate Arthur upon Obtaining the "World RTTY Champion Award" which was recently awarded by the Italian RTTY Group. This Award is based on Contest participation and you will perhaps find more details elsewhere in this issue.

Congratulations are also in order to the following station for W A C . . .

Nr. 129 Larry Filby KG6NAA

I know that we are all pleased that Larry made it before going QRT. He put Guam in many a RTTY log in the relatively short time he was active; and he really was active. He is pretty much involved in his Stateside assignment at the moment but hopes to put out a signal from Vermont as soon as he possibly can, and perhaps from some other "rare spots" if he can swing it in the future. You'll be hearing from Larry from somewhere soon.

It used to be difficult for John, KL7DRZ to work into the states due to a large mountain blocking the path up there in Auke Bay. All that is changed now is John recently moved about two miles and now has

a clear shot toward the states and puts in a real terrific signal in these parts. The comparison is amazing. We used to hear something in there but could never print it, and now, just moving a short distance changed the whole picture. Speaking of pictures, John is real active on Slow-Scan TV up there too on the HF bands.

There has been a re-issuing of call signs recently in the USSR which affects the club stations. Some of the "new" calls you are printing now you possibly worked at sometime in the past. UK1AAA was formerly UA 1KBW, UK4FAD was UA4KED, and UK2GAX used to be UQ2KAX.

There has been a terrific increase in RTTY activity from France in recent months and here are some calls, old and new, that we have either heard or worked lately. F2LV, F2PX, F2UU, F3WV, F5AX, F5BH, F5KD, F5KK, F6AOE, F8KI, F8KW, F8TZ, F8UC, F9RC, and F9ZU. The newer stations are to be congratulated for their interest in RTTY and we all hope that the interest continues.

They say that miracles do happen, and I'm beginning to believe it. It was close to midnight local time and we were trying to finish this column so we could get it off to Dusty in the morning when we heard this RTTY signal on the frequency the receiver was set at. The printer was activated and CQ de HI8XRM appeared across the page. Needless to say, the mill was pushed aside, and we were the second QSO for Bob since he started up on RTTYon the night of June 5th. Bob is originally from Iowa but has been in Santo Domingo for about 14 years and runs one of the broadcast stations down there. He says that he set up the RTTY for handling emergency traffic in the event of hurricanes which are quite frequent in that part of the world. We hope of course that it will not have to be used for that purpose. After we cleared the frequency the west coast boys were right there ready to go and Carl, WB6RXM was next with Merrill, W6AEE standing by, At this point we shut off the Rx and got back on the mill to get this finished. QSL's can go to --

Robert E. Meyer
P. O. Box 385
Santo Domingo
Dominican Republic

or it can go via his QSL Manager, WA2RSX. Good Hunting!

Al, WA5EGG/MM is aboard an ice breaker in the Artic Ocean, although not a separate country he is always an interesting RTTY contact.

Newt, K8QLO has a number of QSL cards from EI stations for distribution. This is the first group of cards since Newt offered his services as QSL manager for DX stations. If you have a EI card due send to K8QLO with a stamped self addressed envelope. See the May DX column for details.

Since this is the combined issue we will not be back for two months. We hope that you fellows in these latitudes have an enjoyable summer, and those of you on the other side of the Equator will not have too severe a Winter. In the next issue we will run the RTTY-DX listing. It is slowly but surely closing in on the 100 goal. If you can, please send in your latest totals in the next few weeks and many thanks to those who already have.

73 de John

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SCANDINAVIAN Society

In the interest of better organizing the fast growing interest in RTTY in the four Scandinavian countries and for better and more efficient liaison with similar groups in other areas the S. A. R. T. G. was recently formed and includes the four countries of OX, LA, SM, AND OH.

The President is Karsten Tranberg, OZ4FF, Box 121 Roenne Denmark, The Group Managers for the different countries are OZ7OF, SM7DMC, LA7MC, and OHONY

A Net meets every Wednesday at 1830 GMT on 3585 Khz. A news bulletin is transmitted every Wednesday at 2015 GMT on 3585 Khz by SM4CMG (OZ7T) and every Sunday at 0815 GMT on 3590 Khz by SMOSAA.

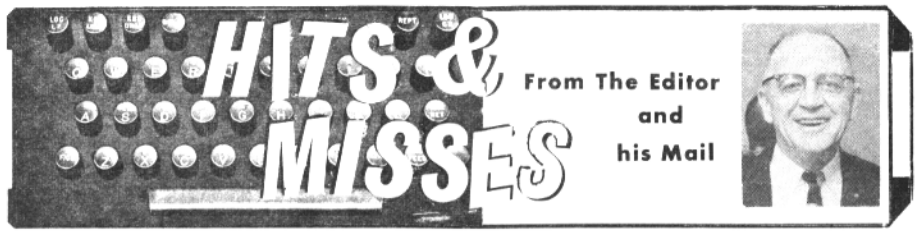
Contest manager is SM5AP. Newsletter editor is SM7DMG. Technical assistants to the Group are OZ6OB and SM5BRQ.

The SARTG both encourage and solicit the exchange of ideas and information with similar Groups in other areas.

***

ST-5 PC Boards

We understand that
Stafford Electronics 427 South Benbow
Greensboro, N. C. 27401
have ST-5 boards ready for sale. There are two boards, drilled and solder plated for easy construction. We understand that the price of both boards is $6.50. We have not heard of any parts kits but HAL Electronics who have an ad in this issue can no doubt supply them as they have parts for the ST-6.



We have sometimes wondered, why, with a number of well printed and edited magazines catering to all amateurs, we have such an enthusiastic group of subscribers to the JOURNAL. In analysis however, the JOURNAL presents more RTTY information than all other magazines combined. No magazine covering the entire amateur field can present more than a couple of RTTY articles a year and none of them have the room for specialized RTTY news.

I suppose the JOURNAL is like a big frog in a small puddle, but thanks to a loyal group of authors, donating their services, the JOURNAL frog on a number of occasions has made a big enough splash to lap over into the big puddle ---- .

The TT/L was first published in RTTY in 1964 and the TT/L-2 in the RTTY JOURNAL in 1967. The ST-3 appeared in the JOURNAL in 1968. The ST-5 in the JOURNAL in May 1970. All of these articles have or will appear in the general magazines many months afterwards.

With a little research we could fill a page with the exclusive RTTY items appearing in the JOURNAL but this is not our purpose. We are happy to have anything reprinted, every magazine reaches different groups in their subscription and the more articles reprinted the more new readers will be exposed to RTTY information. Our lag time between receiving an article or news item can be as little as three weeks, most magazines require at least three months. This permits many new ideas to be tested and improved by a number of experimenters in a minimum of time. The perfected ideas can then be rewritten and published in other magazines when of sufficient interest.

We are now in our fourth year of publishing the JOURNAL and the subscription list has grown slowly but steady in that time. There are a number of things we have learned and have made a few small improvements as we go along. Many of them as suggestions from our readers. Regardless of what we do, or how many subscribers we have, it is the authors in the long run that keep the magazine interesting and worthwhile. Never have authors given so much for so little, we appreciate it, and hope you do.

***

Somewhat in line with the above it has been suggested that we publish a list of RTTY articles appearing in other publications. We think this is a good idea but lack the time to make up a list of any past issues at this time. We will try to include any articles appearing in the future. If any reader has the back issues, for maybe two years, of the amateur magazines and would like to compile such an index we would be happy to publish it.

***

This is the combined July-August issue and we plan on mailing it about a week later than usual. The September issue should be mailed on schedule about the 20th of August.

***

Present plans call for the publication of the ST-6 by Irvin Hoff, W6FFC in the next issue. This is a deluxe solid state demodulator with a number of features. A number of these have been built and tested and we hope to be able to offer circuit boards and kits at time of publication.

***

Any readers interested in FM operation should have a book being offered by Sherman Wolf of Two-Way Radio Engineers. It is advertized in the classified section and from the copy we saw has EVERYTHING on the operation of just about any Motorola FM set. Schematics, crystal details, adjusting, alignment and as far as we can tell all information necessary for trouble shooting or operation of these sets. We put this plug in not because of the advertising but we feel this book would be invaluable to anyone operating this type of rig. It is $6.50 but I am sure any purchasers will agree it is worth it.

***

Our shipment of binders arrived and all orders have been sent out.

***

28 Modifications -

Continuedfrom page 7

Now install the "angle bracket" between the rear ends of the end brackets.

OK, we are ready for the "fun" now. We are ready to put in that remaining rod through the center of the stunt box. First, look at all the tops of the function levers to see they are in proper position. Then insert the rod from the "bottom end" of the stunt box so that the end of the rod with the little groove that the retaining plate holds will come out the top end. It might have such a groove on each end, so no bother in that case.

Try to wiggle the rod so that it comes out the top bracket far enough that the retaining ring will grip that groove we mentioned. When successful, lay the stunt box on the bottom side, remove the bolt holding the end bracket to the stunt box (it won't fall off), slip the retaining plate into place, reinsert the bolt into the end bracket, and you are all finished with the installation of parts into the stunt box.

REPLACING THE STUNT BOX

You are now ready to replace the top bracket and electrical switch. As soon as this has been accomplished, you can put the stunt box back into the typing unit. As this was discussed in great detail in Article 4 we shall not go into it further at this time.

TRYING IT OUT

You can easily see if things are going to work. Just type well over to the right margin and keep typing. As soon as the bellcrank collides with the projection on the rear of the spacing drum, it should pull in the "Zero" code bar, and then whatever you type next, it should return the carriage and turn up a new line.

Again if you are one of those without the code bar or bellcrank, of course nothing will as yet happen, as you have some additional work to do. Also, this assumes those having these parts have already installed that small bracket into the bellcrank, as shown in Fig. 3 in the Feb. issue.

SETTING THE RIGHT MARGIN

You "75-80%" who are all done now, will want to check the total length of line you can now get prior to an automatic CR-LF action. You should get 73 total spaces, and on the 74th have it automatically return. Normally this would be only 72 spaces and return on the 73rd, but since we had you install the simple non-overline in Article 4, this sytem works properly when set for one additional character, due to the nature of its operation.

On the spacing drum there are five bolts holding the front and rear rings to the spacing drum. These bolts are visible in Fig. 2, to some extent. One of them is about halfway between the arrow and the center nut of the spacing drum itself. You can see another bolt to either side of that one, and one more to the bottom of that ring. One of the five is hidden from view by the frame that holds the spacing drum in position.

Going clockwise, you will see that the 1st, 3rd, and 5th are all "round-head" bolts and the 2nd and 4th are "hex-head" bolts. The 2nd holds only the rear ring (right margin) in place, and the 4th holds the front ring only (left margin). The three round-headed bolts hold both rings.

This may be a bit confusing, but it will soon straighten out. You must loosen all three round-head bolts to move either the front or the rear ring. Then you loosen either the 2nd (for moving the rear ring for right margin adjustment) in addition, or the 4th (for moving the front ring for the left margin adjustment).

To summarize you have to move four of the five for either the front or the rear adjustment.

If you are satisfied with the present left-margin, just make sure you do not loosen that 4th hex-head bolt at all, and you'll be in business.

At any rate, to adjust the right margin, loosen 1, 2, 3 and 5 -- then you can easily push the rear ring around with a screwdriver about the equivalent of one notch, and temporarily tighten several of the bolts again while trying the line length once more. Moving the rear ring counterclockwise will lengthen the line, moving it clockwise will shorten the line.

If you decide to adjust the left margin, several hints are in order.

First, note how the ratchet fingers grip the notches on the circumference of the spacing drum, so you can duplicate this position after you have moved the ring sufficiently for your purpose. Second, make sure before you loosen the 1, 3, 4 and 5 bolts (no. 2 is for the rear ring, remember) that those fingers are engaging the spring drum and that you are not resting on the left margin stop itself -- that is, you are "away from" the left margin and stopped say in the middle of the page. This takes the pressure off the left margin stop so it will not change until you push it around yourself. Otherwise it could "get away from you". We recommend on general principles that you do not move the left margin at all unless for some reason you feel you would really like to. It's not a difficult job, but it does add some unnecessary work in getting the fingers to engage the notches properly once more.

RESULTS SO FAR

This has taken us through more than half the year. As of this moment we have completed all the changes needed to put the Mouse machine into normal amateur standard. We now have communications type, communications keyboard, non-overline, auto CR-LF (except for that 20-25% who will have to read a few more articles yet), and we have learned how the stunt box works, how to take it out and how to install parts. Indeed you have most likely learned a lot more about this 28KSR already than you ever knew about the model 15 or 19 or 26 that you had been using previously. You are ready for the "icing on the cake" which are the optional things you can put into the stunt box. However, we shall have to ask your indulgence while we explain to the 20-25% of the fellows how they can install their "Zero" code bar, bellcrank and rear ring on the spacing drum before we can continue with some of the special things you might want to do with your stunt box. So those of you who now have auto CR-LF operational, can skip the next two articles as they will hold little interest for you, other than general information now that you are somewhat familiar with the Mouse machine.

***

VHF News--

Continued from page 8

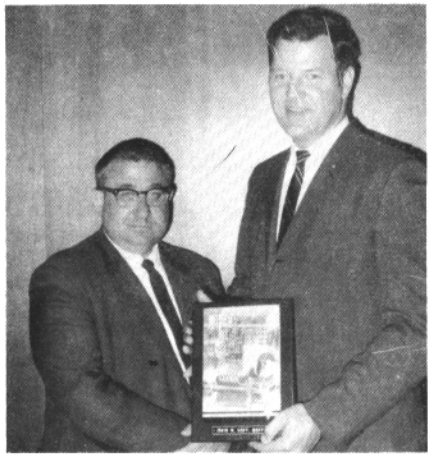
W2DUC (ex-K8AOE), has gotten things started in Rochester. They are operating on 146.700 MHz, with AFSK on FM. The active stations on .700 are W2ALL, W2DUC W2DYY, and K2MPE. Bob says: "There are another half-dozen stations on AM with AFSK, down between 145.0 and 145.35 MHz. We must give them the word and get them up on the Funny Modulation part of the band."

Glad to hear that another city is represented on the VHF RTTY scene. Hope to hear about more in the near furture. If anyone has any info, please send it along.

That's it for this month. Keep those cards and letters coming, folks! 73, es CUL, RG.

***

RTTY Author Honored



Irvin M. Hoff W6FFC is shown being presented with the Cover Plaque award for his outstanding QST article on the Mainline ST-3 demodulator. (QST for April 70). Shown presenting the ARRL award is Doc Gmelin W6ZRJ, Pacifific Division Director, in behalf of the ARRL Board of Directors.

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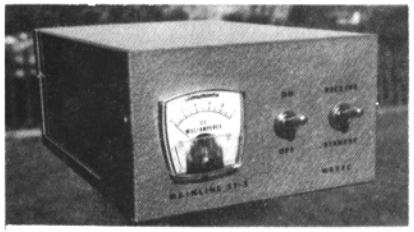
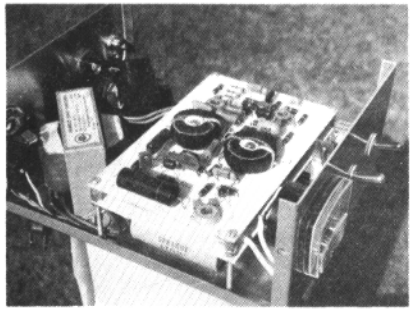
ST-5 Demodulator





The above pictures show a ST-3 demodulator, including power supply, built by the author Irvin Hoff, W6FFC.

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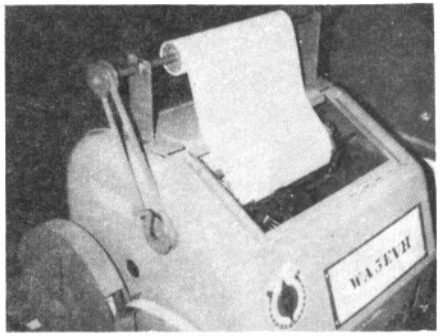
PAPER SAVER



Dear Dusty:

Please note the device rigged to the line feed crank on my machine in the enclosed picture. I lifted the idea from an old picture of Teletype operations but I think that the use to which I put it is rather unique.

The idea is to salvage effortlessly the thousand or so feet of good paper that usually goes to making the carbon in the three ply (carbon copy) rolls that are readily available on the surplus market.

One simply puts the roll of carbon copy paper in the maching backwards so that one then types on what would ordinarily be the back of the carbon copy. This gives one copy with typing on the front and back of the sheet because the carbon sheet is in contact with the sheet on which one is now typing. The other piece of paper rolls up on the auto rolle-r in the picture with every line feed. The carbon paper and typed sheet are allowed to go over the roll and are torn off as desired. At the end of the roll, one has another tight half roll of completely unused paper.

Needless to say, this also makes an ideal paper roller to keep the single ply stuff off the floor.

The device was made by first bending a piece of 1/4" diameter brass tubing in a shape similar to the line feed crank already on the machine but allowing an extra 1/2" or so for the pulley. A slot similar to the original was filed into the machine end of the new crank, and a 2 1/2" maching pulley was fitted on this crank.

On top of the machine are two brackets with U pins to hold a metal shaft on which is fitted the roller made from a discarded tube from an old paper roll. This tube is held by the aluminum end caps that come on new rolls. A 1 5/8" pulley is fitted on this shaft.

The larger pulley was wrapped once with that stickey-on-both-sides electrician's tape while the smaller one was left bare. This allows the roller to slip when the paper gets tight. The two pulleys are connected by a piece of wide seamstress' elastic.

I have used this device through several rolls and have experienced no difficulty with it. Maybe you might like to pass this idea on to your readers in your RTTY Journal.

Sincerely yours,
Richard J. Bourgeois
"Rick WA5EVH"

***

BACK ISSUES---

THE ONLY back issues available are: July through December 1966. No issues of 1967. All issues of 1968 except for January and November. (July-August is one issue). All issues of 1969 and 1970 to date. All copies are 30¢ each.

RTTY Journal Binders are $2.50 each in USA. $3.00 in Canada or Mexico. Custom regulations make it impractical to ship binders overseas.

All copies of the TT/L-2 reprint are exhausted and as this article was reprinted in QST, May and June 1969, we plan no future supply.

Through the courtesy of Clyde Keenan, K7WTQ we have another supply of excellent drawings of the Solid State TT/L-2-MKT demodulator and controls system. There are 12 letter size drawings in all. Available at 50¢ to cover postage and handling. This is the demodulator by Ole Berland, OZ6OB, that was published in the December 69 and January 70 issue of the Journal.

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

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PARTS - ALL MACHINES - fast service on all machines from 14s thru 35s. SASE for list. Sell Fred your surplus TTY for highest cash or trade. Typetronics, Box 8873, Ft. Lauderdale, Fla. 33310 W4NYF

TYPEWRITER RIBBON REINKER, Hand operated model now only $3.50. 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.

J & J ELECTRONICS Builders of fine electronic equipment wish to announce the introduction of their complete line of solid state RTTY demodulators which will appear very soon. Models for beginners to pro. (Watch QST for further details.)

SPECIAL PROJECTS, TU's, kits, expertly built to order. Estimates without obligation. Of, by, and for hams. Applied Electronics Laboratories (W6BD, ex-W6CQK), 1068 Eden Bower Lane, Redwood City, Calif. 94061.

RTTY RIBBON INK: economical (ribbon lasts for years), deep (easy-to-read) black. Widely accepted. Large 2 ounce size $1.25 Postpaid, U.S. Marv. Cook. WA2RDC, 1932 Windsor St., Westbury, N.Y. 11590

FM SCHEMATIC DIGEST: Extensive collection of Motorola FM Schematics, Crystal Alignment, and servicing information, 136 pages 11 1/2 x 17. $6.50 postpaid. S. Wolf, 1'00 Tremont St., Boston, Mass. 02120.

WANTED: Damaged and irreparable MITE teleprinters for parts and MITE spare parts. Also will consider working MITE machines. Rick Bourgeois, WA5EVH, P.O. Box 2746 Lafayette, Louisiana 70501.

MAINLINE ST-6 PC BOARDS and parts available. Please allow us to quote you on boards or on the complete unit. Write for details. HAL Devices, Box 365RJ, Urbana, Illinois 61801

SOLID STATE TU/AFSK generator based on units in July 1969 73 and September 1969 QST. All circuitry including PS on 3 x 6" G10 glass PC board, 850 and 170 HZ shifts, CW ID, zener protected transistor loop switch, reversing switch, high and low impedance output FET audio. $40.00 kit form. Cabinet $5.00 extra. Board only $4.50. 3 pole Butterworth filter boards, drilled 3 x 6" G10 glass, $2.00. Write for details. HAL Devices, Box 365RJ, Urbana, Ill. 61801

CASH FOR BACK ISSUES of radio magazines. Especially want April 1953 RTTY. Orville Magoon, K6DZN, 1941 Oakdell Dr., Menlo Park, Calif. 94025

RTTY CANARY FOLDED paper, 8 1/2 wide and about 3 miles long. $4.00 per box FOB. Andy Clark W4IYT, 41 Lenape Dr., Miami Springs, Florida 33166.

WANTED: #28,32,33,35 ASR & KSR page printers, complete or parts. We pay cash and freight, or trade for new ham equipment. Alltronics-Howard Co. Box 19, Boston, Mass. 02101. (Tel: 617-742-0048)

TOROIDS; LOWEST price anywhere. 40/$10 postpaid. Center tapped 88 mhy or 44 mhy. 32KSR printer reconditioned, perfect $200. Lorenz ASR page printer (all 60 speed) $100. Fresh perf tape 11/16 $10/case 40. Electrosensitive facimile paper $3. box/250. Stamp for list. Van, W2DLT, 302 R Passaic Ave., Stirling, N. H. 07980

J & J ELECTRONICS WILL custom-build your Mainline TT/L-2 FSK demodulator complete - self contained - autostart-heavy duty loop supply - electronic keyer stage - single bar tuning eye - 2 inch scope indicator with separate power supply -- motor control stage includes both FM (Limiter) & AM (Limiterless) with 3 section lowpass filter for optimum reception of 60-75-100 WPM. 8 3/4 x 19 gray hammertone silkscreened front panel suitable for rack mounting - wired and tested by W1SOG, John F. Roache, Windham Rd., Canterbury, Conn. 06331.

TELETYPEWRITER SIGNAL DISTORTION test set. TS2B/TG is a portable signal distortion test set arranged to transmit normal or distorted signals for testing teletypwriter circuits and equipment. The distorted signal provided by the test set may be marking or spacing end distortioner marking or spacing bias. The amount of distortion is adjustable from zero to 50%, it is usually set for 35% distortion. It is arranged to transmit continuously anyone of four test signals; R, Y, Space or a standard test message. A 60 millampere test circuit is built into the test set to provide a means of measuring the bias tolerances of teletypwriter recurring equipment. May be adjusted for use at 368 or 404 apm. It is self contained unit 23 inches long, 17 high and 14 deep, in wooden chest. Excellent. $40.00 each. Teletype catalog on request. Atlantic Surplus Sales, 580 3rd Ave., Brooklyn, N. Y. 11215

TELETYPE PARTS and Supplies; DC supply new $7. Wheatstone perforator with keyboard, accepts 5 unit teletype tape and converts to morse code for automatic keying of CW signal, $75. WE polar relay 255A, $2.50. Polar relay socket for 255A, $2.50. Teletype page printer paper, 3 copies, case of 12 $5.00. Single roll, $.50. shipping weight 50 lbs. per case. Miscellaneous teletype parts and tools. Send SASE for list. L & L Electronics, PO Box 1327. Harrisburg, PA 17105.

RTTY PICTURES FOR SALE. Volume 1, 8 pages $1.00. Volume 2 16 pages $2.00. Over 100 different pictures. Audio and perforated tapes available. W9DGV, 2210-30th. St. Rock Island, Illinois 61201.

ADDITIONAL CLASSIFIED on NEXT PAGE