R T T Y

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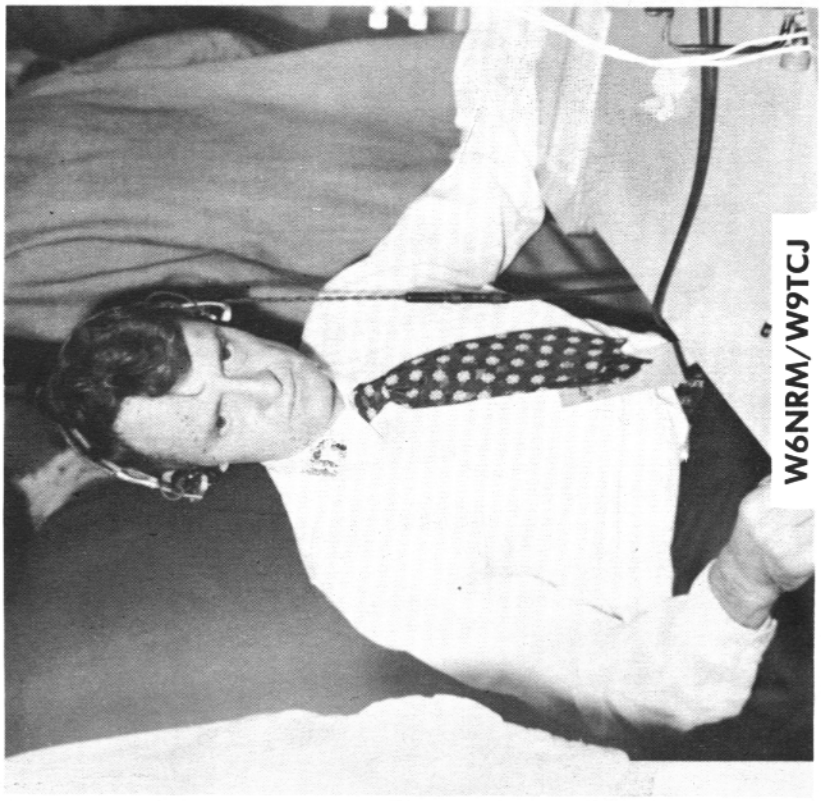

W6NRM/W9TCJ

HORSE TRADES

This page of the Bulletin is for use of amateurs who have RTTY EQUIPMENT FOR SALE OR TRADE and those looking for equipment to buy or trade. It is a free service and may be the means of getting someone on the air.

For Sale—Model 12 with table and cover, less keyboard, Model 15 keyboard with AC motor in one unit, Also Model 21-A printer W9HKA

For Sale—12 ohm, 57,000 turns RBM 110 volt DC DPDT Telephone Type Relays W1AFN

Wanted—Model 14 type equipment ..... WØHFU & WØLFI

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For Sale—Model 15 Complete, Model 12 Complete with Sync Motor—Terminal Units W1AFN

For Sale—Model 12 Typing Perforator, set Vacuum tube

For Sale—Model 26's w/tables W6SCQ-W6VPC-W9GRW

For Sale—Bound Volume No. 3 RTTY (1955) $5.00 .... RTTY

For Sale—Model 0-73/URT FSK Exciter - manual .. W6PZV

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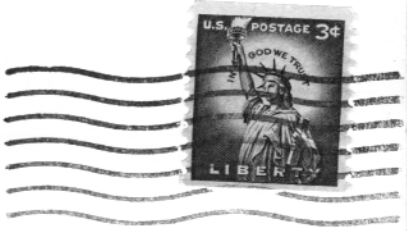

THE RTTY STORY AT W6NRM/W9TCJ

By Bob Weitbrecht, Williams Bay, Wisconsin

My inspiration for this weird and wonderful device called the printing telegraph began in earnest with the appearance of W2BFD's article in the October issue of QST, although notions of one form or another were entertained earlier for a remote controlled typewriter. A year elapsed before I obtained a Model 12 receiving - only printer from a Los Angeles newspaper plant. As I well remember there was a "walking cast" on my left foot as a broken bone was incurred while at work—a heavy signal generator box slid off the workbench and cracked onto said foot. The cast had been on for some time but that did not prevent driving to Los Angeles to pick up the printer, to stuff it into the back of the car—and to bring it all back to W6NRM in Oxnard, California.

This printer was in operating condition and I saw it in action in the newspaper shop. Various parts and accessories were thrown in the deal, except for the keyboard. Using coils and odd parts found in the rummage box, a limiter-discriminator type of AFSK was constructed, aligned, and tried out on the machine. Lo and behold the printer started giving forth with some news broadcast from a commercial FSK signal. Man! but that certainly was something at having results come out of that machine! It had a governor controlled brush type AC motor on the receiving distributor and both motor and distributor contacts generated a particularly vicious noise which prevented reception of any but the strongest FSK signals. At this time (1949-1950) I worked alone with no help except via numerous letters from John Williams, W2BFD, who lent me much aid and encouragement. Over the period of time a study was made of the general subject, noting the various systems in encyclopedias and engineering treatises. It is interesting to note that the whole art of printing telegraphy is old, dating back almost to the days of Samuel Morse. The present five-unit teleprinter code was invented by Emile Baudot, a French telegraph engineer, before the turn of this century.

After six months of searching and writing— I even took a trip to Hawaii on a vacation but kept questing—a keyboard was procured from an east coast ham. It used to be part of a Model 26, and I was able to get it going in a few minutes, using a string around the gear on top of the keyboard and around the bare shaft of a washing machine motor At first the thing was much too fast for the printer to copy, but a few trials of pulley sizes, using tire tape, finally made the proper rate. The setup was crude but it worked! Later some Boston gears, 14 and 16 tooth sizes along with two idler 32 tooth ones, were purchased and mounted so as to reduce the 420 RPM output of the receiving distributor shaft to the required "368-speed" for the Model 26 keyboard transmitting camshaft. A little mechanical work and I had at last an integral send-and-receive teleprinter outfit.

Arrival of a synchronous motor with its gear alleviated the noise problem to some extent and I was able to copy weaker RTTY stations. I remember tuning in one on near 17 megacycles and it turned out to be HLQ-4, Seoul, Korea, transmitting news and press. Trans-pacific signals! Incidently, I copied my first ham RTTY signal on January 1st, 1950, from W2NSD on 11 meter AFSK. Just only a few words. In the summer of that year W7LUK of Phoenix, Arizona (now W6UPY, Stan Mahurin) sent me a letter asking if I was ready for on-the-air RTTY, using make-break (CW) keying. I was receptive to the idea of some tests over the air with him. Some months delay intervened due to his being engaged in business affairs. However his success at noise reduction with a VT keyer system inspired me to design and construct a similar system for my Model 12. A cathode follower scheme was used just so as to keep all magnet coils near ground potential and even now the original chassis still is on the "Thundering Twelve."

In early 1951 Stan and I ran some fairly successful make-and-break (MAB) tests. At W6NRM a tone biased scheme was used—it was fairly good if the CW signal strength was reasonably good and steady. However if the signal varied very much in amplitude, the gain control of the receiver had to be "ridden upon" and even then results were not as would be desired. Of course I was for a long time familiar with the superiority of FSK over MAB, having witnessed wide variations on the audio output voltmeter upon a distant FSK signal yet the printer locked on solidly. Such is the advantage of "telegraph frequency modulation" with a signal for mark and another for space—a "push-pull" effect. Having the circuit diagram of the Collins 709-D-1 FSK exciter in hand, I pondered the idea of using the FSK diode in a VFO, having an old Field-Day portable rig in the shack. Tried it and found it worked to perfection! With the diode mounted on cathode tap of the ECO grid coil via a small mica capacitor, plenty of shift was obtained. I was not able to try this kind of signal out on Stan as he had to go out on another of those business trips at the last moment, but later I transmitted FSK RTTY signals to W6DOU, Paul Lemon in Hayward, California on 80 meters. Due to the question of legality at that time only a few tests were made and W6DOU, W6STA, W6ITH, and possibly others copied my signals. As FSK was officially permited on 11 meters I constructed and operated a 400 watt crystal controlled 11 meter rig for a time but never did make any RTTY contacts on that band due to its being very poor at that time.

In the summer of 1951 I had heard something about 2-meter RTTY activities in the Los Angeles area so I wrote to Leo Shepard, W6LS. Back came a cordial invitation to drop in to see him and to operate his very neat Model 14-15-19 layout at his home near Inglewood. I had wonderful visits with him and his family. Shep took me out to Pasadena, some 15 miles out, to see Merrill Swan, W6AEE, another of those RTTY fiends. Visits were made to several other RTTY stations and a grand time was had. Soon after, I picked up a 16 element two-meter beam, put together some kind of a receiver, and tried like mad to pick up two meter signals from W6OZE, Redondo Beach, California, but without

success apparently because of the rough mountainous areas between Los Angeles area and Oxnard.

In January 1951 I sent a petition to the FCC requesting that low frequency amateur bands be opened to frequency shift keyed emissions for radioprinter operation. This was entirely on my own initiative and in response to an invitation extended to me by FCC to which I had written in regard to low frequency FSK. Apparently this resulted in Docket No. 10073 and all the events that centered around this matter is now history. I recall writing to the ARRL asking when would FSK be permitted, and back came a tart reply making some reference to a petition I had recently filed. Wayne Green, W2NSD, started his "ARTS" Bulletins at about this time and jumped into the fight for the rule changes. It is my belief that he did yeoman service through his newsletters which helped to nourish the infant ham RTTY movement. Two years were to pass, with much wrangling over the docket, confused with other issues for 7 mc. phone, RTTY only in same 7 mc. phone band. and other such matters, not to mention the then existent television freeze problems before the FCC.

In the fall of 1951 I came to Yearkes Observatory, Williams Bay, Wisconsin to work in electronics and techniques for use in astronomical reseach. My RTTY gear was packed and towed across the continent in a trailer. Due to obvious reasons and pressure of other work, little was done RTTY wise until the opening night of February 20, 1953. However in the meantime a new terminal unit was designed and built—this is the "Little Gems" circuit in April 1953 RTTY. It includes a bandpass filter on the input—which proved to be most helpful in keeping adjacent signals and QRM out of the T. U. A flipflop stage is used after the discriminator primarily to give a "toggle-switch" action in keying the teleprinter magnets through the VT keyer-distributor system. Although designed for use with the Model 12, this T. U. proved so successful that it was later installed on the Model 26 system now in use at W9TCJ.

As for tape gear, I purchased a tape transmitter head, Model 1-A, from Shep, W6LS, and then set about solving the problem of a tape distributor. I conceived the idea of modifying the Model 26 keyboard (in 1951) and using its distributor for scanning the tape. After several hours of work I had the six contacts separated and wired to a plug on the keyboard. For the tape advance magnet a switch was arranged so as to be closed by the "locking loop" every revolution of the transmitting cam. For the tapes I went over to the Oxnard Airport office and operated their Model 19 tape equipment for a while, turning out an assortment of messages. Thus at W6NRM I had some sort of tape gear operating for a while. It is interest to note that W6NRM and more recently others have used exactly the same idea although it is my personal feeling that the Model 26 distributor is not designed for such service and should be for the keyboard only. Hence the reason for a separate distributor, so, making use of my pulse technique experience gained from Navy work on timing systems, I designed and constructed an electronic tape distributor. The first breadboard model was so successful that I constructed a second model

with minor circuit revisions and simplification—this is the model described in the January 1954 issue of RTTY. This original unit is still operating perfectly, three years old and with its original set of tubes and parts and is in daily use at W9TCJ for handling all tapes on bulletin service and other jobs.

The present equipment at W9TCJ consists of two model 26's equipped with audio FSK converters such as described above, a model 14 typing reperforator, 2-A keyboard perforator, and the aforementioned electronic tape distributor with tape head. Radio equipment consists of two BC-348 receivers; a 400 watt 80-40-20 transmitter with high-stability heterodyne VFO; 100 kc frequency standard with 10, 2.5 and 2 kc multivibrators with provisions for audio frequency injection for measuring r-f frequencies to cycle/second accuracy; an audio frequency meter with shift measuring provision a la W2JAV-W6ZBV; and various supplementary instruments. Antennas include an end fed longwire for 80 and 40 and a ground-plane vertical for 20 meters.

When transmitting RTTY from the station, the keyboard of either machine keys an audio oscillator for audio FSK, and this tone is injected directly into the T. U. for generating local copy and at the same time the T. U. feeds DC square waves into the diode modulator in the VFO exciter for frequency shift of the outgoing carrier. A switching system is employed for accomplishing this end, and is so designed as to permit single control send-and-receive for the utmost in simplicity and convenience in operation. During reception, the receiver feeds audio tones directly into the T. U., and tuning indications are shown by means of 6E5 "magic eyes." A convenient control is provided for "remote vernier tuning" of the high-frequency oscillator in the receiver over a range of several kilocycles. The shift meter is employed for measurement of shift on received signals even while they are transmitting ordinary matter.

I could go on and on discussing various things in this fascinating RTTY field but it seems that I should close my story for now. All in all, ham RTTY is a most successful going concern and I am well pleased with results that my present equipment has given over the several years since the opening night of ham FSK on low frequencies. The model 26 teleprinter is an ideal machine for general purpose ham RTTY and it should be pointed out that we are doubly fortunate to be able to obtain such printers from the various sources at reasonable prices. Such gear satisfy our requirements very well—in the way of lightness, single-magnet working, compact, easy to operate-and-maintain devices.

In the works is an automatic-start receiver-printer for low frequency RTTY use. It will be on 24-hour service and it will be possible for any RTTY station to start it up, "leave a message" and then shut it down by using keyboard signals. Further details will be available at a later time, however, the model 26 is an ideal printer for this kind of service.

In closing, I hope that you have obtained as much enjoyment as I have out of RTTY in the seven years I have been working in that field. It is now an important and growing facet of Amateur Radio, with untold possibilities for communications purposes.

THOSE FILTERS !!!

By R. Couppez, 85-15 139th St., Jamaica 35, L. I., N. Y.

When I received RTTY for February 1956, I sat down to make some figuring. Here are the results:

Since a teletype square signal lasts 22 milliseconds (we better write 0.022 sec.), two consecutive pulses will last 0.044 sec., which is the PERIOD of a complete unitary "FULL WAVE" signal, one mark and one space. Dividing 0.044 into 1, we find 22.72 or the FREQUENCY in cycles per second of same periodicity.

If we, now, adjust an audio signal generator to produce a pure sine wave at 22.72 cycles per second, and if we apply this pure sine wave to a pulse shaper (a Schmidt trigger, for instance), the output will be a series of square (rectangular) pulses, each exactly 22 milliseconds long, and these pulses will be strictly equivalent to the square pulses outgoing from a well adjusted RTTY transmitter.

What follows is, perhaps, less known:

When we audio modulate at the rate of 100% our 522 transmitter (and this holds true with any other type of transmitter) with such square pulses at 2125(or 2975) cps, we actually modulate a "CARRIER" (2125 or 2975 cps) in such a way that the rectified audio pulses at the receiving station will restore the "DC" square pulses considered.

This is possible ONLY if we take steps so that the "carrier" 2125 (or 2975) cps and ITS SIDEBANDS (Yes, indeed!) be NOT mutilated somewhere during the process of transmission and reception.

after Fourier, Euler and others, it can be shown that square packages of waves such as those mentioned are nothing else than a SUM of several strictly pure sine waves selected and combined together according to a certain systematic rule, which I am about to explain. They are the sum of 100% of the audio voltage at the carrier frequency (2125 cps) PLUS 33.3% of the same carrier's voltage but given to a pair of sidebands (the first order sidebands) THREE times 22.72 cycles higher and lower than the 2125 cps carrier, PLUS 20% of the same carrier's voltage but given to another pair of sidebands (the second order sidebands) FIVE times 22.72 cycles higher and lower than the 2125 cps carrier, PLUS—and so forth—endlessly—choosing each time an additional pair of sidebands whose voltage and frequency will respectively be one seventh and seven times, or one ninth and nine times, — and so forth — using in same manner and successively all the available ODD numbers, — until you become deeply disgusted with such a stupid game.

In other words: if we apply 100 volts audio modulation to the final of our transmitter, everything happens as if we would apply simultaneously:

100 volts at 2125 cps,

plus 33.3 volts at 2193.16 cps,
plus 33.3 volts at 2056.84 cps,
plus 20.0 volts at 2238.60 cps,
plus 20.0 volts at 2011.40 cps,
plus 14.2 volts at 2284.04 cps,
plus 14.2 volts at 1965.96 cps,

— and so forth — till the end of time according to the explained rule.

The voltages mentioned are successively 1/3, 1/5, 1/7,— of the carrier's voltage, while the frequencies are respectively 3 times, 5 times, 7 times, — 22.72 cycles added to and subtracted from the carrier's frequency. This is basic, and should you not agree with me, please show it!

In order to make much more money, the Telegraph Companies have greedily figured that they may squeeze many more "channels" on a same telephone line, provided that their equipment can handle only the first order sidebands, or maybe only the two first order sidebands. But they are shrewd enough not to tell you that their signals are always at least strong enough to compensate for the obvious lack of sidebands. In clear words: it is a trick which works only if the signals are strong and their equipment does not need then to be of the HI-FI TTY type.

RTTY amateurs are not that greedy, but they are willing to spend money and a lot of time in trying to receive weak and dirty signals, and for this reason, they cannot afford to "round off" those cute (?!) and very elusive square pulses.

If you plot a curve of the sum of the fundamental and the first order sidebands, you will get something that is far from being a square pulse. If you include the sidebands of the second order, the curve will look a little better, but will not be a real square wave in any way.

It is agreed that on very high quality circuits (I mean: circuits where signals are very comfortable) the first order sidebands may suffice. It is agreed also that on a little lower quality circuits the first and second order sidebands become necessary.

Unlike Telegraph Companies, we RTTY amateurs must be prepared for the worst: let us not kid ourselves about it! We need SEMI-HI-FI RTTY circuits, but only up to the point where noise and jamming signals spoil the whole deal. Isn't that true, Bruce?

It is a matter of personal taste to decide which sidebands will be kept and which ones will be deliberately mutilated. However, if we like to keep the third order sidebands (and after all this is not exaggerate) we must give to our equipment a bandwidth of TWICE 159 cps, that is about 350 cps, to include a 10% safety margin.

It finally boils down that a decent RTTY amateur filter should/must pass without any loss everything from 1950 to 2300 cps for the mark channel, and everything from 2800 to 3150 cps for the space channel. I respectfully dare to state that this is about sufficient for our needs.

Take now the ARRL Handbook, 1956 edition, page 563, at Band-Pass Filters, three-element pi-section, just the ones proposed by Phil and Roger, in RTTY, February 1956, pages 11 and 14.

The Handbook gives the formula:

$$L = \frac{2(f_2 - f_1)R}{4 \times 3.14\, f_2\, f_1},$$

which shows that, all other things being kept equal, the bandwidth will increase if the inductance increases. To simplify

the work, let us write that $f_2 - f_1 = b$ and that $f_2 f_1 = f^2$, b being the bandwidth and f the center frequency of the filter.

The formula may be rewritten

$$b = \frac{6.2832\ L\ f^2}{R}$$

Just for the fun of it, let us make now

R=100,000 ohms

L=0.088 henrys

f=2125 cycles

the value of R was claimed adequate by Roger, and the value of L is the one of these C-114 coils used by Phil.

$$b = \frac{6.2832 \times 0.088 \times 4\ 515\ 625}{100\ 000}$$

Any way you figure it, it always ends up to:

b=24.9 cycles....!!!!% ?/#/±" '.

Which means that Phil's filters are flat but ONLY on 25 cycles! If you prefer, we could state that they are not at all of the BAND-PASS type, and that they are merely PEAK-PASS FILTERS.

Do you want sharper filters? You just use the filters data given by Roger or by W4OLL (see CQ September 1952, page 28, same thing!). I really don't dare to make the figuring because I would find that the peak-pass-like bandwidth would be roughly four times less wide, not to say narrower: some 6 cycles.

If the load R drops to 10,000 ohms, the Phil's filters peakwidth will widen to 250 cycles, but you will get such results only if you actually load them, don't forget that! I do ask you: What's the idea of using "torrid" coils under those conditions? Do you know that torroid coils become lousy if you apply more than a volt or two into them, the Q gets disgusted and goes with the wind. You better use torroid coils at LOW LEVEL, where they behave nicely.

We understand now why 39 cent shoddy AC- DC BC sets audio output transformers can do wonders.... when adjusted by expert hands, such as those of Wisconsin's Wizard's (RTTY April 1953, pages 5 to 10).

If you don't like the spoiling of the Q of your coils at 10,000 ohms load, you better use a ten times greater inductance value, say 0.88 henry, with R=100,000 ohms again. Provided the coil's Q can stand it! That's TEN C-114 coils in series! The peakwidth will become a 250 cycles bandwidth.

Should you want my 350 cycle bandwidth for both Mark and Space filters, with again those 100,000 ohms load, not more and not less, then make the inductance 1.23 henry for mark and 0.629 henry for space. You will find the corresponding value of the tuning capacitance by dividing 0.005609 by 1.23 for the Mark channel or by dividing 0.002861 by 0.629 for the Space channel. These mysterious numbers are nothing else than the LC products for 2125 and 2975 cps.

You will find that the tuning capacitance is 4547 mmfd in ALL circuits Mark and Space). Does that surprise you?

This again brings out two different things: First, in each such filters, if the loads are equal, the inductances should be equal. Check with the formula of the Handbook. But Roger gives (page 14) unequal values of inductances—WHY?

The second thing is that, as you can see, the inductance used for space is roughly HALF of the inductance used for mark. On this important point Phil, Roger and W4OLL are just silent! Why?

If you build your filters in a jiffy you will never see it, but if you compute them carefully, you will notice that the bandwidth is constant (350 cycles) while the square of the channel frequency varies by that ratio of about 2, that's why the two inductance values may not be equal. And if they are the bandwidth won't be constant. You must agree on such a thing.

I will leave up to you to plunge again in the Handbook to find the coupling capacitance, I hope you will not get lost! You have by now almost everything that is absolutely necessary to be prevented from building filters that are a bit too much out of this world.

This story brings out the following 64 kc question: We are not all engineers —Some of us are! We are just amateurs —Teletype fans! Hobbyists!

MUST WE BE TINKERERS!?

Our hobby is NOT an easy one! It takes skill, courage and patience!

Couldn't we introduce less tinkering and some more BALANCED engineering in our experiments and designs?

REMEMBER: Theory is always right!

If you don't belive in those sidebands, listen to this: It happened to me, it is a true story!

Some years ago I got a job. My very specific assignment was: to find out why an already built terminal unit didn't want to work properly. The unit had even been rebuilt, but the beast didn't want to work, period!

The filters had been made (prior to my time there) by the world's finest pioneers in fine toroid filters, not to say the least. It didn't help at all and the brand spanking new model 19 subbornly printed in Greek-Chinese anything that was sent to it in English, in closed circuit, in our smoky and hot lab. on the ninth floor.

The boss was mad and . . . shaky. Everybody was desperate and pale, but I was not. They had to beg a shameful extension of delivery, because we would not be ready for the deadline in any way. That's how business is run some times.

I hade a severe plotting of those filters, those cute and ultra expensive filters, the finest available on Broadway, in our city, just built especially to order for us.

My boss didn't want to believe it . . . I must say that he had ordered the filters . . . and that the filters had been ordered to be specially sharp, that is; as shary as a modern filter can be, just because space and mark had the funny idea to be at 1225 and 1325 cps. It was a 100 cps shift affair, what you would call by now a narrow shift square deal What do you think, it was absolutely necessary to prevent mark from leaking into space—and vice versa of course. That's why the filters had to be so sharpy!

We had a big discussion, I should say "argument," even several of them, in

that hot lab, mostly about decibels, cycles —sidebands also. Tell me! How can sidebands exist when the shift is so narrow? There is no room for them! Are you crazy? It's even from then on that my boss was nicknamed Mr. Decibel Gr_____. he really deserved it.

I re-wrote the specs for new filters, civilized filters of course, filters kind to sidebands, I mean. What's the idea to have so sharp filters? I ordered JUST what was necessary, not more, but at least that. Nobody wanted to agree, in that hot lab.

When the filters arrived, the 19 printed right away in English and in English only, for the very first time in the history of that project, never the monster had been so happy—one of those things! Listen, boys, be kind to your machines, please.

Today maybe Mr. Decibel Gr___. still will not admit it, but the firm got rid of him in some way, and now they are making (I mean; trying to make) filters TOO. Be careful, gentlemen, when you buy your filters! Also when you make them!

From now on, and this is entirely up to you, you better believe also like hard rock, that decibels do really exist — sidebands too, and that you have to live with them.

——NEXT MONTH——

"An Amateur RTTY System"

by Dave E. Chapman, W9DPY

Lombard, Illinois

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W6AEE—Merrill Swan
W6SCQ—Lewis Rogerson

For Traffic Net Information:
W6FLW W6IZJ

For "RTTY" Information:
W6CL W6DEO W6AEE

Memorandum to: KH6ZD, KH6LD, KH 6AED, KH6BD.

I have been trying for some time to have a good RTTY contact with the Hawaiian Islands. I had one "loose connection" with KH6ZD (I think) until we got lost in the QRM. I keep late hours here and think forty meters is best just before daybreak here. I have made many calls "CQ RTTY Pacific" on even 15 minute intervals between two and four-thirty a. m. Central Standard time. (I raised KC6CU in the Carolina Islands one time who was on CW only)! I put out about 800 watts on 80-40-20 meters and have worked 31 states so far and most places where there are active printers.

Merrill, W6AEE, is coming to your Islands June 25th so you better get your gear whipped into shape for the few days he will be with you, and test it out on some DX—that's me! He will surely want to work from some of your stations. Merrill is number one gent in our book and we expect to talk to him May we?

Therefore please look for me around 7140 kcs on every quarter hour between three and four a. m. CST most every morning. I think that is before midnight your time. May be on other times, possibly earlier. I have full tape equipment which I will run about five minutes and listen ten. Will start calling by the time you get this and continue most every decent night. The foreign B C stations and jammers cause a lot of QRM at other hours. Twenty meters is all loused up with South and Central American phones most of the times but can try if you prefer. Think around 7140 kcs is best for a start. Do you accept the challenge???

—Boyd "Beep" Phelps, WØBP

RYRYRYRYRY

"Very many thanks for your reply of May 31st. Glad to know that my letter was received so promptly! Actually, it so happens that mail to U. S. A. closes here on a Monday afternoon, which I endeavor to catch, so maybe that explains why it did not take very long. There are of course, several closing times throughout the week, for the various Air-lines which travel your way.

I regret very much not hearing 'BeeP' calling. Jove, but heres a little information which may interest you and WØBP. Firstly, I heard (CW unfortunately) W6AEE QSO with K6BWJ at 1755 NZT on May 29th and WØBP QSO with W6MTJ on May 30th at 1855 to 2000 hours NZT. Signals were 100% and had I the machine, would have been able to procure surely 99½% copy. I tried to bust in with my CW rig, but realize that with two strong sigs working together, my chances of being heard

that way would be somewhat remote.

One thing seems obvious tho' Merrill; forty metres will provide a known channel for RTTY stateside from here. Since copying Roger on RTTY, I have kept a listening watch around 7140-50 kcs. and have heard many other good signals very clearly, and logged their respective call signs. I often rig up my TU and just listen to the response from the Polar Relay.

Since writing you last, I had the opportunity to attend the National Convention of NZART which was held over the weekend June 2-4. It was resolved that I, and others, interested in RTTY, should inform the Council of the frequencies which we wish to use, for their action with the Post and Telegraph Dept. Unfortunately I was not the Delegate this time, so could not do much about it at that time, However, it should work out O. K. in the end. I will operate forty for sure.

I met several fellow-Hams who were, or rather, are, interested in Teletype. I write them with information on how to get going, and so forth. I will be sending the RTTY Bulletins around to them, as they come to hand here. I will give you their callsigns, and names, for your information. The first one, which I believe to be a very sound fellow indeed, a very capable Ham, is;

ZL1AU, Morrie Walker, Norwood Rd., Bayswater, Auckland, N. 3.

The other chappies are;

ZL1NT, Basil Hill, 41 Brookfield St., Hamilton, N. Z.

ZL2LJ, Pat O'Grady, 104 Sidlaw St., Wellington E. 5. N. Z.

I will not mention the others who may possibly be interested at a later date, but should I hear of other 'certainties' I will let you know who they are.

It is very possible that Morrie may be able to aquire a permit for a machine, by using me as a lever. He will have a good case to base his claim on, really. To date they are not aware of my endeavours to procure equipment, as I considered that until such times as I procured a machine myself, there was not much point in it. At a later date, I will be able to give them an exact procedure for them to follow, which will eliminate all the trials and errors, which we have encountered! It may be wise to test their reactions first off. The rig-a-marole may put them off! But I feel pretty certain that Morrie will be keen enough to see it thru. One never knows, Merrill, he may come one with SSB RTTY! Incidentally, he lives approximately 100 miles south-east of here.

I have my rigs here all ready to go, immediately the equipment arrives, and with the note which you have kindly supplied, I do not expect even the slightest difficulty to bring the machine in. I looked in at the Customs Dept. when at Convention and had a very interesting chat with one of the Officials, who was keenly interested in the entire affair. Maybe that may be of assistance to me, when the time arrives.

At the Aeradio here, they now have another 15. Gee, Merrill, it would make one cry. It is just reposing there doing absolutely nothing, and here is little me, rearing to go. Ultimately, it will be used for a circuit to the nearest Airways office in Whangarei, but, now

heres a comical thing. They have not yet a spare machine to put on the other end of the line! Gosh. If the original Boss was still here, why he'd bring the jolly thing down here to my shack! But of course, nowadays, everything is exactly as it should be, with no perks for any person.

But never mind. The day will eventually come, and we will be all the more grateful for it, at that time. Brother I'm going to be hard-put to thank you good fellows for all that you have done, and are doing on my behalf. Mayhap, one day I may have the opportunity, and pleasure of reciprocating in full measure.

I forget now, whether I mentioned to you, of the passing of my very old friend (and real OT of amateur radio here in N. Z.) Neil Shepherd, KL1KH. Originally he held the call OZ2BY, Z2BY. It was not all together unexpected, as he had been very sick for some years, but it was nonetheless a considerable shock to us all. He was active right up till the time of his passing. Then again, last week, a very fine gentleman, a personal friend of mine, who lived quite close to me (not an amateur tho) was knocked down by a pedal cycle and suffered severe head injuries, from which he did not recover, passing on last Thursday. Quite a very sad period. But enough of that.

Sincerely hope and trust, that both yourself and your Good Lady there, have a truly wonderful time during your trip to KH6 land, and I hope everything goes well with you all. With those thoughts, then, Merrill, I will close, and patiently await developments

—Bruce—ZL1WB

"On behalf of the Denver Radio Club, Inc., I wish to thank you for your donation of prize material for the Rocky Mountain Division Convention."

Carl L. Smith, WØBWJ
President

RYRYRYRYRY

Ye gawds what a long letter. Just wanted to bring you up to date on current activities and plans. The midwest RTNET is now in three sections, 3618 kc for W8 area, 3620 for W9 and 3630 for WØ. About ten stations more or less total the number of report-ins in all Nets Combined.

Will close for now. Hope to work you on 7 mc pretty soon. W6MTJ and the W6's sure coming through fine at night on 7140 kc or a bit lower.

—73, de W9TCJ

RYRYRYRYRY

LEGITIMATE EXCUSE FOR NOT CHECKING IN TO NET

. . . . Roger I did. And I wanted to report a SKUNK-DOG incident immediate adjacent to my shop here. Result I am leaving the place open to air and may not make it back at Net time. I don't know yet. So if I don't show, please check me in, otherwise I will handle Net if you like. Gotta shove off now before I suffocate. W6FLW de W6IZJ.

. . . . Roger Ed. Well I think that is the best excuse we have had for an excuse yet, hi. The skunk dog incident must make it quite miserable in the shack so you run Ed and we will see what we can do here. See you later. W6IZJ de W6FLW.

Traffic Net News

By EMILE DUVAL, W6FLW

The RTTY Society of Southern California Net operates every Tuesday evening at 8:00 p. m. on 147.85 mc.

ACTIVITY FOR THE MONTH OF JUNE, 1956

June 5--W6CMQ, N. C.—26 Checkins

W6AFX	W6JFZ
W6BPG	W6NAT
K6BPI	W6NWM
K6BTK	W6OZO
W6CAP	W6SCK
W6CKS	W6SCQ
W6CMQ	W6VAD
W6DNJ	W6WYH
W6DYB	W6ZBV
W6EV	W6CND
W6FLW	W6EGZ
W6IZJ	W6KMT
W6JAU	W6RCM

June 12—W6ADD, N. C.—28 Checkins

W6ADD	K6IHG
W6AEE	W6IZJ
K6BTK	K6JDN
W6BPG	W6KMT
W6BWG	W6LDG
K6BWJ	W6MOY
W6CK	W6NCP
W6CKS	W6PFF
W6CMQ	KN6QQV
W6CZ	W6SCQ
W6EV	W6VAD
W6FLW	W6WYH
W6FBF	W6ZBV
W6FNW	W6ZVO

June 19—W6ADD, N. C.—20 Checkins

W6ADD	W6FLW
W6AEE	K6IHG
K6BTK	W6IZJ
W6BWG	W6JAU
K6BWJ	W6LDG
W6CKS	W6OJF
W6CMQ	W6PFF
W6CZ	W6SCQ
W6DYB	W6MOY
W6EV	W6ZBV

June 26—W6ADD, N. C.—15 Checkins

W6ADD	W6CND
W6BPG	W6CZ
W6BWG	W6EV
K6BWJ	K6IHG
K6CHU	W6IZJ
W6CK	W6LDG
W6CKS	W6VAD
W6CMQ	

SWITCHING PRINTER COILS IN THE MODEL 26

BY BOYD PHELPS, WØBP

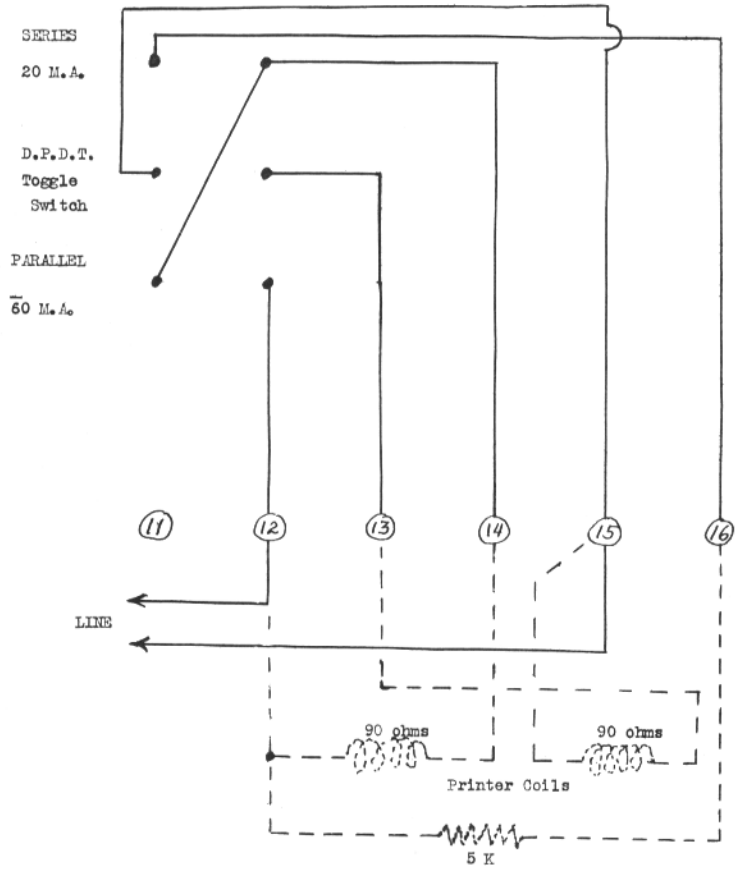
Greater flexibility for experimenting, interchangeability of printers between stations, power supplies, or emergency set-ups can be had by installation of a DPDT toggle switch to connect the printer coils in either series or parallel on the Model 26 machine. Many hams prefer the 20 ma. series connection but perforators and reperforators require 60 ma., so a quick change switch is convenient when so used. The idea was stolen from the basement of W9GRW.

There is ample room on the right rear of the keyboard base which has several drilled and tapped holes for the U shaped bracket on which the toggle switch is mounted. Lay a piece of paper over the holes and poke a pencil thru for a template of the base which need not be drilled. My bracket was sawed from the end of a little old chassis and is 1¼ x2¼ by 3 inches high, but size is not critical. The top horizontal face is stamped for 20 and 60 ma. switches positions and may be seen and thrown by just lifting the front hinged cover and reaching in. A few inches of wire to the terminal strip 11-16 completes the project in a few minutes, wired as shown in the sketch, the jumper lugs not being used with the switch.

My printer, keyed with the low voltage high current 6W6, works with either switch position due to compensation of cathode bias resistance change from 45 to 180 ohms. No household can afford to be without this handy dandy switch feature.

SKETCH ON NEXT PAGE.

DIAGRAM OF SWITCHING PRINTER COILS



Series or Parallel switching of Printer Coils in Model 26.

Solid lines show new switch wiring.

Dash lines show internal printer unit wiring which is unchanged.

Old jumper lugs on terminals 11 thru 16 not used with switch arrangement.

W9BP, WØBP

SERIES OR PARALLEL SWITCHING OF PRINTER COILS IN MODEL 26

Solid Lines show New Switch Wiring

Dash Lines show Internal Printer Unit Wiring which is unchanged

Old Jumper Lugs on Terminals 11 thru 16 not used with Switch Arrangement