



# BELL BREAK

## A Semiautomatic Means for Rapid RTTY Intercommunication

By ROBERT H. WEITBRECHT — W6NRM

Here's a way to achieve rapid and pleasurable exchanges of transmissions between two RTTY stations engaged in a QSO! It's a simple switching system using a "ratchet relay"—easily obtainable at any radio parts store—that permits both local and remote control of a transmitter and a receiver in each station. A microswitch is mounted or affixed in such a manner so that it is operated by the bell-signal lever in the teleprinter machine. Now, let's say your station is receiving a transmission from my station—and when I desire to "turn it back" to you at the end of my "talk," then I transmit a BELL signal just once (upper-case "S").

What happens? The BELL signal operates bell-signal levels in both of our teleprinters. These levels operate microswitches that next cause our respective ratchet relays to operate — presto! *your* station is placed in *transmit* position and my teleprinter is now receiving your turned-on signal. You go ahead and type—the bell has informed you to "go ahead." And at the conclusion of your talk, you send BELL signal again to perform another switchover at both ends—turning on *my* transmitter! With quick acting relays the switchover is so rapid that both machines usually don't notice the fact that it has occurred, or at most causes them to return to "LETTERS"—a convenient arrangement.

Thus is in essence the BELL BREAK. When engaged in a "question-and-answer" session, such transmissions are usually very short and then it is quite a chore to have to send station calls both in RTTY and CW at end of each transmission. The FCC regulations state that so long as each transmission is not over three minutes in length it is permissible to sign calls at least every ten minutes. Moreover, the FCC also sanctions the use of this BELL BREAK system, as was determined officially by W3-LGK-W3MHD (See February 1956 RTTY, p. 3-4), the originators of this method. There are other obvious uses for this sys-

tem—as in traffic handling, for instance. An operator can "Roger" each message in a quick and efficient manner, or fills are expedited in like manner. All in all the system is a simple and close approximation to the ideal "person-to-person" conversation via single-channel radioteleprinter.

Only one "special" relay is required—the ratchet relay—and it is readily available at most radio parts stores. Several manufacturers make such items; for instance Guardian type RC-100-BR "remote control relay" and Potter & Brumfield PC-17-D ratchet relay. Lately the latter relay has been modernized and now incorporates a "toggle-action" together with 4PDT contacts, and this type is to be highly recommended and costs less than the predecessor unit. A variety of magnet coils are available; for our application let us use a 115 volt AC coil, and operate it from such a source of power via the bell-signal microswitch.

Shown in the photograph is a microswitch assembly mounted on the rear of a Model 26 typing unit, in such a position as to be operated by the bell-signal ringing lever rear end projection. Two pieces of aluminum were formed and fastened to the machine back, making use of two existing holes in a springbracket for machine screws to run through. The switch is of the normally-closed type, and the bell-signal lever holds it in open circuit except during the instant when BELL is received and rung. The resistance and capacitance shown are employed for spark-suppression purpose (100 ohms and .1 mfd being typical values).

And in the figure is shown the simple circuit of the BELL BREAK system. The circuit is drawn as would be for use with a RTTY station employing an audio type of terminal unit, together with audio-oscillator keyboard signaling, and utilizing a single key to put the transmitter on-the-air. (FSK fed into the rig at all times from TU). A pushbutton is added, as shown, to permit manual control of transmit-re-

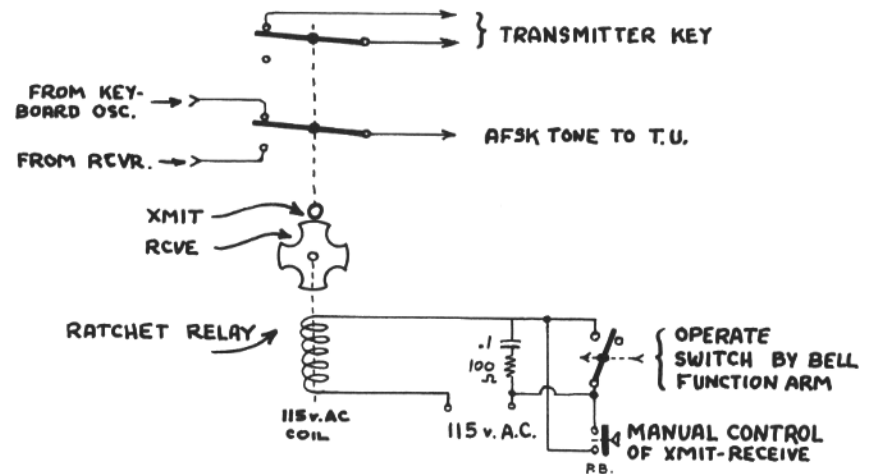
ceive functions. In fact this button is needed in order to "overrule" the system in case it is in wrong position at any time.

In essence this scheme is equivalent to having a single-lever transmit-receive switch at hand, and this lever is alternately placed in transmit or receive position when the BELL signals are received. Depending on what equipment is available, this system can be further simplified to just controlling the transmitter keying (on-off) with the keyboard signal directly injected into the rig, and depending on the receiver to make copy from one's own signal or from the other station as the case may be. Or other equipment may justify more elaboration, such as transmitter HV power control, receiver cutoff, antenna relay operation, switching of audio tones, and the like. The Potter & Brumfield relay is available with contact arrangements up to four-pole double-throw contacts, and thus permit use with any kind of circuit as each station layout may involve.

Let's go Bell Break! This system is in common use out in the Midwest and East Coast areas and it makes for such ease of intercommunication that there is no other equivalent simple method of RTTY operation. This is the nearest thing to working duplex, yet only one transmitter is on at a time. One slight defect, however, is inability to actually "break" the other station, and as a result it is necessary for the transmitting operator to avoid giving a "captive audience" feeling to the receiving operator. In other words, use discretion and avoid verbosity during communications! With this simple caution, BELL BREAK is a fine and simple method of rapid RTTY intercommunication between two stations.

Note that this system is useable only between two stations thus equipped. For use in a "round-table" QSO, it is necessary to devise a selective method so that only one station selected will be "triggered-on," instead of having everybody coming back at once. This is indeed possible and would be FB for work in a regional traffic net. What do you think of this? Give it a thought!

## BELL BREAK SYSTEM



# THE W8SDZ FSK MODULATOR

KEITH B. PETERSEN, W8SDZ

The advantages of this new type of keyer or modulator circuit are:

1. D.C. loop for local printing while transmitting. This means you don't have to have your receiver on the same frequency you are on, in order to read your own sending.
2. Insensitivity to voltage changes in power supply. This means the shift will not change in width if the supply voltage should change slightly.
3. Positive shift—either mark or space—no in-between. Also no chirpy transitions between mark and space.
4. Needs less capacity to shift the same amount as older type circuits—more efficient.
5. Uses no relays or neon bulbs.

Operation of the circuit is explained thusly:

The "D.C. loop" is comprised of R-1, the printer magnet, the keyboard, and R-2.

On mark, the current flow in the loop produces a voltage drop across R-2 of about 40 volts. This voltage is applied to the cathodes of the 6AL5 (thru the R.F. filter—RFC-1 and C3). 20 volts (which is obtained from a tap on the power supply bleeder) is applied at point "B" to the plates of the 6AL5. Since the plates are negative with respect to the cathodes (i.e. —have less positive voltage on them), the 6AL5 does not conduct.

On space, there is no longer any voltage drop across R-2 and effectively the cathodes of the 6AL5 are grounded. (Thru R-2). Since the plates are at a 20 volt potential and are now positive with respect to the cathodes, the 6AL5 conducts. This causes the internal resistance of the 6AL5 to become very low and effectively shorts out the R.F. choke (RFC-1) tied between the plates. This places the lower end of the shift condenser at R.F. ground potential (thru C-2) and lowers the frequency of the VFO. When the loop is again closed, (mark) there is again approximately 40

volts drop across R-2 and this places the cathodes of the 6AL5 tube at a positive voltage greater than that which is applied to the plates. This causes the 6AL5 to cease conducting which unshorts RFC-1 and places the shift condenser above R.F. ground. Since the shift condenser has no R.F. ground its effect on the VFO is negligible and the VFO returns to the mark frequency.

The RFC that is connected from the cathodes of the 6AL5 to R-2 is to prevent any rectification of R.F. by the tube.

You will note that there is a resistor (R-3) connected across the printer coils. This is to absorb the back E.M.F. that is produced by the printer coils. This back E.M.F. can cause the transmitted signal to be biased unless this resistor is used. Note that this resistor is already in the teletype model 26 machine and is used when the printer magnets are connected in series for 30 MA operation. When using the printer magnets in parallel for 60 MA operation, it is recommended that a 3,000 ohm 2-watt resistor be connected across the printer jack (J-1). The only changes necessary to convert this circuit from a 30 MA loop to a 60 MA loop are:

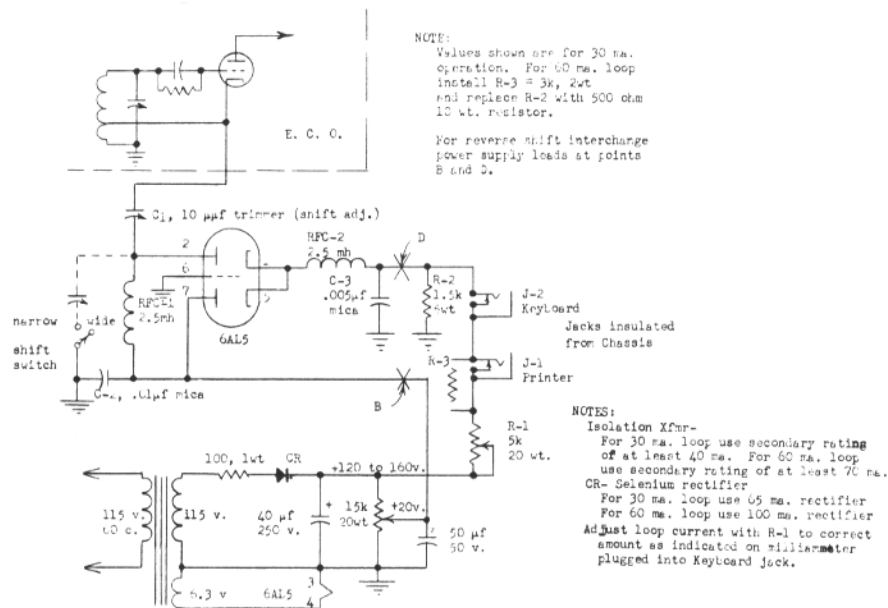
1. Replace R-2 with a 500 Ohm 10-Watt resistor.
2. Adjust R1 for 60 MA loop current—as measured in the keyboard jack.

The adjustments of this circuit are simple—

1. Adjust the current limiting resistor (R-1) for the desired current in the loop—as measured with a meter in the keyboard jack.
2. Adjust the tap on the bleeder in the power supply to the 20 volt point.
3. Adjust the 10 MMF trimmer condenser for the proper amount of shift.

That's all there is to it . . .

This circuit will work very nicely for narrow shift also. All that is needed is the addition of a ceramic switch and capacitor. This is added at point "C" in the diagram.



I have drawn it in to show the method of connection of this addition. To switch back to wide shift, it is only necessary to throw the switch to take out the added capacity. This same idea can be used to give several pre-set shift widths or to give pre-set shift widths for each band. The only adjustments necessary are:

1. Set the original 10 MMF trimmer for the widest shift you operate on the lowest frequency band you operate.
2. The added capacitors are adjusted in order of frequency. The lower frequency bands first, of course.

Should you for any reason want the shift to be reversed (space high), reverse the connections at point "D" and point "B."

When you want to receive, you will have to provide some means of switching the printer from the loop to the terminal unit output. I use a double-pole—double-throw switch or relay in this application. The printer is connected to the arms and one set of contacts goes to the printer jack in the loop. The other set goes to the terminal unit output.

This circuit can be used with a crystal and will work satisfactorily even on 80 meters with a good crystal. The only change necessary is to remove the 10 MMF trimmer (C-1) and replace with a 50 MMF trimmer. The adjustment procedure is the same as for the VFO type of FSK modulator.

One word of caution—the use of germanium diodes in the FSK modulator is not recommended. Their unstable characteristics tend to cause instability in the VFO frequency as well as the width of the shift.

This circuit is now in use daily at W8SDZ and I have had no trouble with it so far. Reports of the range of my signals have been extremely good.

I think that you will like the operation of this circuit, and, if for any reason, you have trouble with this circuit, don't hesitate to write me or contact me and I will do all I can to help you out. The circuit is simple and there should be no particular adjustment problems with it. Keep the FSK modulator as close as possible to the VFO tube and use short leads.

## Bothered With Unshift on Space ...

Or is it that you just can't copy the baseball scores from the commercials?

By LEN HERZMARK — K O B W U

7730 Falmouth — Prairie Village 15, Kansas

Some of the 26's in use by the fellows around the country have no such function but most of them do unshift everytime a space key is depressed at either end of the wireless circuit. Mine was in the latter category and try as I might I couldn't find the little giz that made it do that. I did see the little shift lever going back and forth on shift, unshift or shift, space, but for the life of me I couldn't see through the maze of other moving parts to find what caused it. Here I was, a Chemical Engineer, who had been practicing Mechanical Engineering for the past eleven years, making cams cam, push rods push and rollers roll on all kinds of nice machines but couldn't figure that thing out. A postcard to W6AEE brought back a multilithed booklet with a drawing of a 26 on the front and some lines of the table of contents underlined in red with a couple of red check marks next to a couple of numbers further back in the booklet. Yeh, but how do you un-unshift on space?

Didja ever look at the bottom end of the shaft to which the type wheel is attached? *That's* where the giz is! The clutch, along with the function arms which form the function control assembly, should be removed from the shaft by first printing the letter G, and then removing the machine from the base. The locking screw is now in a position for easy removal of the assembly. The unit is keyed to the shaft with the locking screw. Loosen to remove. Numbering from the bottom, the unshift function arm is the fourth one up. It has two projections at approximately right angles to each other. One of these cams the unshift function lever when you depress the unshift key (letters), the other when you space. A simple analysis of the situation says that since we don't want the functions on space, remove the arm. Which one? Well, looking down on the assembly held in a vertical position, clutch down, orient the function arms so that one of the (unshift) arms points to twelve o'clock and the

other three o'clock. Three o'clock has got to go. Grasp the extension firmly with the pliers about a quarter of an inch from the end, twist back and forth a couple of times and that's that.

While the thing is out, oil the clutch well and put the assembly back on the shaft. It can only go one way. Now, let's replace the machine on the base, reconnect the motor and see if we took off the correct arm. We can always cannibalize another 26 if we didn't. Shift to numbers, depress 1 2 3 4 5 6 7 8 9 0! 1 2 3? Looks as though we did it right.

Of course, if you have Bulletins 158, 159 and B 1074, you can read, re-read and puzzle over these for a couple of days like Merrill made me do, and you could figure it out without having to put up with the foregoing levity.

73 DE KOBWU

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**For Information Regarding the  
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**W6CLW—Ed Simmons  
W6AEE—Merrill Swan  
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**For Traffic Net Information:  
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**For "RTTY" Information:  
W6CL W6DEO W6AEE**



Please renew my subscription to the RTTY Bulletin for another year. Bulletin is the wrong word, I think, because it really is a neat little magazine.

Anyway, you will find enclosed (I hope) my personal check for \$2.50. Glad to know your subscription rate is not going up this year, hi.

You will find me on 40 RTTY most of the time now with a Model 26, home brew FSK VFO, and a quarter gallon to a pair of 811 bottles.

Hope to see my station listed in the RTTY callbook in the future. W8JST

No activity to report on teletype as yet. Still haven't unpacked all the gear since the last move. I understand there are quite a few on in the Detroit area but have only met two of them so far.

One of these days when work slacks up a little I hope to finish the terminal unit and get on the air.

In the meantime, keep up the good work on the Bulletin. W8HOE

Dear Folks:

Just a short note to thank you both for your hospitality during my recent visit to Los Angeles. It was very kind of you, Merrill, to drive me all that distance; and Margaret, thank you very much for the very fine dinner you prepared on such short notice.

Regarding the cover for the Model 14 typing reper of W6KJO: I will not need it now, as up in San Francisco I had the good fortune to talk to Dick Urian on the land-line up at Jack Pitts' office and I bought a unit from him—to be picked up as soon as I can get to his QTH.

Jack organized an RTTY dinner on short notice with Roger Wixson and Buck to help. It was a fine affair, and Buck took some pictures, so you should have one or two for the Bulletin.

73 es tnx a million,  
BYRON, W2JTP

We have gotten a great deal done on the new TU here in the past few weeks. Have a few rather interesting features in it that might well be of interest to the gang. As soon as it is all finished and assembled we will write it up with diagrams and pictures for you. If it has any merit you can print any part or all of it as you wish.

We find that the discriminator on the Gates AFC circuit works well on 170 cycle shift. The bandpass of the discriminator is practically nill, but we are using pulse restoration which seems to make up adequately well for sideband loss. (All due respects to Mr. Coupepez.)

One commend. That was a nice little writeup on the FSK adapter for the KWS-1, with just one exception. The little wire to the VFO tube pin moves when you switch sidebands. So the PTO goes out of calibration between lower and upper sideband. I have tried an almost identical unit here, which was not too successful. Might try a short hunk of shielded cable to the PTO pin, but I think the added capacity would be too great for the PTO. Generally, a PTO is a good thing to leave alone if at all possible. A good idea might be to shift one of the hetrodyning crystals in the KWS-1. WOYKZ

At last activity on RTTY is in progress in Tulsa. A group has formed, about eight members and are incorporating to obtain equipment. W5WI Oren Gambill President, W5TVG Sam Goldish Secretary, K5BSS Dan Gridley Vice President, W5ZBI Phil Garver Treasurer, members-W5ZBD Grant Isbell, W5RMQ Dick Taylor, W50GA Newt Armstrong and yours truly W5ESV B. F. McCoy. The club's name is "TARTS" Tulsa Amateur Radio Teletype Society. The goal is 25 members or more. Now I am happy and hope to be more active. This should be news and appear in the RTTY don't you think? Any help and suggestions that you can give to further the progress of "TARTS" will be appreciated. W5ESV

NEWS .....

In case you should be interested, here's the list of equipment at W8SDZ.

XMTR: Pair of 304 TL's in push-pull—1000 watts.

Exciter: Home brew heterodyne VFO utilizing the BC-453 and shifting a XTAL that beats the High freq osc of the 453 to 80 meters.

RCVR: 75A3-B Collins. (B stands for additional product detector and fast attack-slow release AVC).

AMT: Folded dipole half wave long and 50 feet high.

I work 80 meters exclusively. SSB and RTTY.

Machine: Teletype model 26-A.

T.U.: Home brew—my own design—has flip-flop and 60 db limiting and toroid band-pass filters (W9TCJ style filters). (No relays — all electronic.)

I have taken the T.U. down to the W.U. and measured the bias and distortion on our W.U. bias and distortion meter and it measures zero bias and less than 1% distortion. I think that it would do well for some of the fellows to watch out for distortion on some of these T.U.'s that have been described recently. I have found out from my experience at the W.U. that your signal can read zero bias and yet have considerable distortion. The printer will print but you don't have much leeway for those fading RTTY signals which will go all over the bias meter as I have noted from some actual off the air tape recordings. In my experience with teleprinters here at the W.U., I have found that some printers will have good range but are unable to print signals that are more than 20% biased. (marking or spacing.) If the adjustments are set right, the printer should have at least 75 and preferably 80 points of range from a local test. These adjustments are fairly critical in that you may get the 80 points of range from the local test, but the printer is unable to copy 25% biased signals. All our printers here are put through a test that sends just that—25% bias—into them. They are adjusted and readjusted until they conform to our specifications of being able to read signals with as much as 25% bias.

I might add at this point that this is really easy to achieve if the printer is carefully adjusted. I can print 25% marking and 25% spacing signals on my 26-A.

It might interest some of your readers to know that the W.U. is changing over to electronic operation of their circuits and eliminating polar relays wherever possible. The present trend is to polar operation. In fact, the W.U. has converted some of its larger offices to all polar operation. This would seem to indicate that M.A.B. is fast loosing out in the commercial fields. I understand that some of our rival companies are still using on and off keying (AM) on their carrier systems instead of the FM (FSK) type of carrier systems that the W.U. uses. They are rapidly converting over to FM systems and discarding the AM systems entirely. The Western Union Telegraph Co. has done this many years ago and, to my knowledge, there is not one single piece of AM carrier equipment in use today here at W.U. In my mind this settles once and for all the question of M.A.B. vs FM (FSK).

There are about 5 fellows in the Toledo area who have machines ordered and they will be on the air with RTTY just as soon as they arrive.

I would like to know if there are any back issues of RTTY available and, if so, at what price.

If anyone in this area needs help or would like to have their printers and keyboards tested out on our bias and distortion instruments, I would be happy to do what I can for them.

W8SDZ

— 0 —

Am leaving 8 March for King Roger Six land and hope to be on air within a month of arriving there. Have just shipped the main pieces of my gear this week, which includes: Model 19 table, Model 14 typing reperf, W2BFD autostart unit, Johnson Romomatic with 20 & 15 meter beams and receivers. Am ordering, this week, a Central Electronics 100V—but have no idea when they can make delivery.

Plan to be in Okinawa at least three years, so by that time will manage a few RTTY QSOs I'm sure. Have good prospects of receiving a dual diversity job, URA-8, which is capable of narrow shift reception and if so, anticipate some fun. So, see you then. W6WEM

Enjoyed the new issue of "RTTY," which arrived over the weekend, and in particular the article on the modification of the I-97A Bias-Meter.

In this article the author makes reference to the use of a 20-cycle source in testing the system, but does not mention where same may be procured.

Pacific Communications, P.O. Box 555, Livingston, N. J. has a limited quantity of these units, known as Converter M-222, which is used by the military as an emergency source of 20-cycle ringing power. I happened to receive a sample of this unit last week for an industrial account, but it appears to be a perfect, compact source of 20-cycles with either sine or square wave output available.

The unit contains a 20 to 24 cycle vibrator which is actuated by a pair of 1½ volt dry cells, and the vibrator contains single-pole, double-throw contacts which could be used for square-waving switching. However, the output is fed thru a step-up transformer with wave-shaping capacitor to provide about 150 volts sine wave AC output, no load.

If any of the fellows are interested, I suggest they contact the Pacific Communications firm directly.

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Jack Pitts, W6CQK, made the interesting announcement that Bob Weitbrecht, W6NRM/W9TCJ will now be permanently located in the Bay Area, having accepted a position on the staff of the Stanford Research Institute.

With the coming Pacific Division ARRL meeting being held at the Fresno Ham Fest June 7 and 8, Dick Segerstrom, W6CQI, was appointed chairman, Chuck Bey, W6PHS and Howard Hale, W6FYM on the committee to handle arrangements for operating RTTY display in Fresno for this meeting. As we all remember, the RTTY talks and demonstration at Fresno were one of the outstanding features of the convention.

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Reference to the activity in the State I submit the following:

At the moment we have W4EKB, Greensboro, N. C. W4RRH, Morganton, N. C. W4CVU, Mars Hill, N. C. W4HKB, Winston-Salem, N. C. and K4RRG, Winston-Salem, N. C. on the Air with RTTY. I believe all machines are Model 26 except W4RRH who has a Model 15. Except for K4RRG none of us have had any experience with this medium, but we are learning. W4CVU is the technician of the group. If we had a medal we surely would give it to Ray. We had to start with nothing except a firm desire to use the medium in the State. RTTY, Inc., Especially Merrill Swan, RTTY Handbook and some army manuals have assisted in many ways. It surely has been fun getting these machines working. Golly, if these engineers knew the trouble they caused this operator. Spent almost a month getting the wiring as per the diagram. Only to find the whole time was wasted(?) Shucks, we could have torn out the whole mess and still have had RTTY. Anyone wanting some instructions from a Ham that is no engineer, and not trying to impress anyone just drop me a note. I have had everything happen that can happen (I guess) to a drop of oil on the Selector Magnets (A machine will run wild if that happens) and I believe I can help with straight talk. W4GXR Forest City, N. C. has a machine on order from W7-HRC also W4OFV, Winston-Salem, N. C.

Our big stumbling block in the State is securing machines. We have plenty of interest, but very few machines. The wire companies and the Contracting Company for "Teletype" don't seem to understand WHY the amateur is trying to invade their field. Which is wrong, we simply want to use it on the Amateur bands and to help perfect the art of using Teletype on Radio Circuits assigned to the Amateur. At the moment we are in the process of forming a Society in the State, in the hope we can convince the persons concerned we are sincere, and as Ray, W4CVU says "We will make these stumbling blocks into stepping stones." Those of us in RTTY realize the potential involved, the ice is broken, and we plan to push RTTY with all our being.

W4RRH

Something you might mention that occurred to me the other day concerns the current trend toward ready built equipment from antenna systems to automatic keys. I know this has been discussed before, but the fact still remains that RTTYers must build. I hope this continues. The ever-increasing trend to factory made complete stations, in my opinion, encourages sloppy operation. The bands are being cluttered up with people having little to say and no particular way of saying anything.

I hope you will continue to put out a fine publication with such a constructive and positive influence that has been forgotten by many. W9VYD/K9EWO

#### MORE K R 6 DX COMING—

W6WEM left in early March for Okinawa, and hopes to take up the slack that "CAS" KR6AK leaves when he goes home. Jim is taking Model 19 table, a Model 14 typing reperf. O-5B FSK unit, and a W2-BFD autostart panel. He also has placed an order for a Central Electronics 100V to be shipped from the factory. Jim has good prospects of getting a dual diversity job capable of narrowshift reception (URA-8). He will be beaming both 20 and 15 meters from a Johnson Rotomatic, and is looking forward to some RTTY contacts in KR6 land. QTH is James A. Johnston, W6WEM, 17th comm Cnstr Sqn, APO 239, San Francisco, Calif.

WANTED: *Weather Teleprinter*, receiving only. W7ANX Fred Decker, Dept. of Physics, School of Science, Oregon State College, Corvallis, Oregon.

WANTED: Information on Tone Keyer Navy Type CALO 35049, unit of RDM equipment, manufactured by Bond Equipment Co. W6WEM James Johnston, 17th Comm Cnstr Sqn, APO 239, San Francisco, Calif. ARTS 50-38.

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Talk about tape on the floor, this was paper on the floor! I measured it: 52 feet 9 inches of it. And I quit ten hours early.

Will try for a visit some time when we know you are home.

Tanks a lot and C U L, W6HIF

Per two mentions in CQ, apparently data on the F R A converter is hard to find—References below is where I find data for my F R A, it may be of interest to readers of RTTY:

F R A Frequency-Shift Receiving Converter. Data is available from Clay Cool, 443 West 47th St., New York 36, N. Y. Ask for ARTS Bulletin No. 40 which contains the schematic and theory, and Bulletin No. 41 which has data on conversion for operation on 455 kc. Enclose 25¢ for each bulletin desired. W2EBZ

Have been spending a great deal of time traveling and also at my FS7RT and PJ2-MC. Plan to ship back a new Model 28-ASR (equal 19) when I go back there before long and get on the air with it and my KWS1. W6ITH

The NCARTS had a swell impromptu dinner for Byron last night, and he gave the fellows a lot of much needed info about that East Coast outfit.

We talked to W3CRO, Dick Urian, on the phone today, and Byron now has his typing reperferator, complete, so guess that El Monte deal is not necessary. We looked for you for a half hour on the air yesterday from W60WP, but ND.

Maybe you had XMTR troubles.

Byron is leaving for home tomorrow night on the plane at 7:25 p.m.

Hope to see you at the Fresno convention. Will sure be there with "Bells" on.

Byron is up in S. F. working right now—7:50 p.m.—but will include his very 73 also. W6CQK

Finally back on RTTY after an absence of a couple years. Have a Viking Pacemaker for an exciter now and sure is a big improvement as far as drift is concerned up on 15. Sure a mess of new calls on RTTY since I was active before.

Worked DL4WX on SSB and DL41W on AM both on 15 metres and they have printers with them and both should be on the air shortly on RTTY. Also worked KZ-5KJ about a week ago for a new country on printer. I also broke down and purchased a Conset Tri Bander so should be putting out a pretty good signal on 20 and 15 now. W7LPM

Just a note to let you know I have moved here to Michigan. A little town close to Detroit called Plymouth. The company I work for offered me a job as electronic instructor and trouble shooter at an attractive price so here I am. Hated to leave the Coast but I may be back out there in a few years. I am working with electronic bookkeeping machines which is fairly close to RTTY as it's all done with pulses. (Use Cannon plugs too.)

I'll be able to travel around the country a lot too and may drop in on you sometime. I am going to be in Portland, Ore. for a week starting May 23 and then in Spokane and Seattle for two weeks.

Hear "Beep" on 7140 regularly from here but there doesn't seem to be much activity locally. W6PGP/8

#### STAFF OPENING AT THE UNIVERSITY OF ARKANSAS, FAYETTEVILLE, ARK.

Academic appointment is available as Research collaborator or Assistant Professor to supervise designing, fabricating, and maintaining specialized electronic research equipment. Examples of the type of equipment involved are: nuclear pulse amplifiers, scalars, single and multichannel analyzers, and coincidence circuits; special high-voltage supplies, d-c amplifiers; radio- and audio-frequency oscillators.

A properly qualified person will have the opportunity to participate in electronic research related to the University research program. Typical fields of current interest are ion-source techniques, radio-frequency communication, missile and satellite tracking, and high-voltage accelerator techniques. A suitable person may, if he desires, be given an opportunity to conduct courses in his area of specialization. Salary in range of \$7,000. Annual appointment with one month vacation. Application or further inquiry should be made to Dean Virgil W. Adkisson, Research Coordinator, University of Arkansas, Fayetteville, Arkansas.

(This typewriter makes errors as easily as the Model 26.)

Band conditions on 40 have not been good; although I did hear you couple weeks or so ago but not too strong. Also heard Bob, ex W9TCJ also but not too strong either. W3MHD

Just received March issue of RTTY and got a big charge out of seeing my call in the results of the RTTY Sweepstakes X Submitted information only because saw that W7YZQ had less points than I did. My extensive operation at the time was confined to two meter AFSK so I worked one station under two calls (OM & XYL team) X Don't know why I couldn't have worked W6ASJ, VPC WIS VYI VVF NKP as they all are on the MARS two meter RTTY net X Guess they were too busy looking for Section Multipliers X Last Friday I made my "big splash" really on the "men's" band eighty meters X Got all the way to San Mateo K6CZ then later to El Cerrito (Metropolitan Oakland) with W6VYI X Thanks to you and Don Jackson W9BQC for the FSK method as appeared in RTTY X Put 500 ohm pot across key terminals of Viking I and away we went. X Viking 122 VFO is stable so the SSB boys say and my new (March 29) 75A4 says. X I print on XMTSN by copying on the air sig thru rcvr X If shift, vfo, or rcvr drift—no print my transmission and it seems to hold solid for gud long transmission. X

That I heard you in on 3620 Friday nite but am not sure X My code is really slow—Never got it very fast except for license X Heard you and the 8's Sunday nite on Forty X Couldn't copy anybody really solid, even QSB on you but got nuff to see wot was going on X Think you'd have been better on 3620 X Maybe see you on RTTY one of these days but if I do pse qrs on the cw hi! K6ZBL