The last issue of the Bulletin was already on the presses when the word came through that our long sought objective had been won and that within a few weeks we would have the privilege of operating on the lower frequencies with frequency shift keyed teletype. The regulations were not exactly what we wanted, much gnashing of teeth being heard about the c.w. call signing sections, but then this was sugar-coated by the open invitation of the FCC for us to get busy and use the present regulations and then suggest improvements. In their own words: "It further appearing, that clarification of the proposed requirements for the transmission of call signs as requested is desirable,". Full reproduction of the release and regulations should appear in CQ and QST so I won’t fill four pages of the Bulletin with it.

There has been some confusion among the newer adherents of RTTY about FSK and AFSK. The new regulations permit FSK (frequency shift keying) in the bands: 3500-3800 kc, 7000-7200 kc, 14000-14200 kc, 19300-19350 kc. No new bands have been allotted to AFSK transmission (audio frequency shift keying) so the old bands of II, 6, 2, and up are still authorized for this mode of operation. With FSK the frequency of the transmitter is shifted 850 cycles and there is no modulation used. With AFSK the transmitter frequency remains unchanged and an audio tone is used to modulate the carrier. This audio tone is shifted in frequency by 850 cycles.

I was a little disappointed to note in the FCC release that only 266 comments were filed with the FCC on the docket. That means that if no one except the teletype gang wrote a letter to them there still was less than half of the gang who bothered. This is a rather large block of complacency or indifference. Is it that you who didn’t write didn’t care whether we were able to use the low frequencies or did the date for all comments to be in sort of creep up and pass you? I hope it was indifference for that is much less destructive of the two prerogatives. If you intended to write and then didn’t, you have let us all down. Just suppose that any one of the several groups who are against RTTY getting into the low frequencies had put up the meagerest sort of opposition to us. We were darned lucky. The feeling that there is someone to do the job can defeat us. When there is a letter to be written no one else will ever write it for you. Your letter is all important. In a couple months we shall be wanting the FCC to amend the new regulations with respect to the call signing procedure. FULL RESPONSIBILITY for our success in this rests squarely on your own personal shoulders. If you write we can get what we want, if you don’t, we get nothing except what the ARRL wants us to have.

Standards

In view of the rather varied assortment of equipment which is in the hands of our members it is probably a good idea to rehash all of the operational differences so that we may be able to intercommunicate with as little friction as possible.

One center of continuous misery is the "unshift of space" function which about half of the members have. I am afraid that Johnny Williams has created a Frankenstein monster unintentionally by trying to keep the different types of machines in separate areas. The unshift machines are mostly out west, while in the east there are few to be found. The upshot of this is that many fellows who have been used to using the unshift machines will suddenly find that they have to remember to send the LTRS pulse whenever lower case is desired or else the rest of the gang will have to learn to read the $@ etc. of the upper case alphabet.

RULE: SEND THE "LTRS" PULSE WHENEVER SHIFTING TO LOWER CASE.
One difference that is of less importance, fortunately, is that of the BELL key. Most machines have this function on the upper case "S" while the rest of them have it on the blank key. Unless you send both signals there is no simple way be sure that you are ringing the bell on the other end.

In order that all machines may have a chance for the carriage to return to its starting point, exactly like a very good frequency, but of course the actual value of it as a permanent parking place will be more clearly determined in time as we have a chance to use it. On twenty meters the calling frequency is much simpler for our purposes to use the "S" key only. This is a fairly clear way to do it, and has little or no c.w. to chop up the W2K signals. The selection of 80 meters was more difficult. Desiring to have the channel on an even ten kc frequency for ease in checking with a simple 100 kc standard and 10 kc markers, I brought us up against the rather imposing array of ARRL frequencies. This was greatly facilitated by normal VHF propagation. To this end, it would be most desirable to operate RTTY on lower frequencies where use can be made of frequency shift keying (type P2 emission) permitting operation at signal-to-noise ratios as low as 5 db. (Voice communication requires a minimum of 20 db S/N, 30 db is desirable; CW requires of the order of 15.)

This is interesting to note just what these db mean: Imagine, e.g., an AM radiotelephone transmitter operating at 71.4 watts input (this is an average representative power). And further, imagine another station just copying this station with a noisy background. This represents the 20 db S/N case just referred to. Now, if this station wants to be clearly copied (30 db S/N) he must raise his power by 30-20, or 10 db and must run 714 watts input, the legal limit. On CW (15 db S/N) the power could be reduced by 20-15, or 5 db, and the input required would be 22 watts. If, on the other hand, the transmission was RTTY, the power could be lowered to 20, 15, and 10 db, but 22 watts input would be required.

Summarized, we have these representative conditions:

- A3 emission, 100% copy: 2 watts
- A3 emission, noisy: 71 watts
- A1 emission, 100% copy: 22 watts
- FL emission (RTTY), 100% copy: 2.2 watts

The bandwidth required for standard speed teletype (nominal 60 wps) transmission is only slightly in excess of a well adjusted CW transmission at 30 wps. The required bandwidth is a small percentage of the total spectrum space occupied by an AM signal. An interesting sidelight is to note that the management of commercial radio circuits has long realized the superiority of RTTY, as shown by the gradual replacing of CW by RTTY signals commercially. Interest in amateur RTTY is strong. Well established local networks are now operating in the U.S.A. where recent conservative estimates place the number of active stations in excess of five hundred. Here in greater Toronto there are at least five or six stations equipped with the necessary RTTY gear. Some of the stations now operate on VHF, while others wait low frequency authorization (type A1 emission). I have talked with a few boys similarly set up in Montreal; rumor has it that a ham in London is equipped - but we cannot have intercity QSO's - yet.

I myself have installed the teletype gear necessary to operate my station, VE3AKO, using type A2 emission. There is a proposal (Docket 10073) before the P.C.C. requesting, in part, FL RTTY privileges on portions of the "CW exclusive" parts of the 10, 15 and 20 meter bands. I should like very much to be allowed type FL emission on low frequency bands. Specifically, I see no reason why our licenses should not grant type FL emission for RTTY wherever an exclusive type A emission authorization exists. I hope the Department of Transport will feel inclined to further the technical development of amateur radio in this respect.

Very truly yours,
Frank A. Ford, P. Eng.
W2BFD vs Letters

Every now and then I get a letter from someone who wants me to ask John Williams about something "the next time" I "talk to him." This usually has to do with an unanswered letter or some piece of equipment that hasn't come yet. A few words of clarification are perhaps in order about John and his mail problem. First, it should be understood that John has a store and works at making a living for himself, his wife, and daughter whenever there is not too much RTTY stuff to do. In the line of teleprinter he has about major projects on the fire which require construction and testing; he is on the air several times a day talking with the local gang (two meters); he types up special bulletins and runs them off with his tape equipment; talks on the phone an hour or two a day to local TT gang or out-of-town visitors; has visitors out to the store at least once a week and spends from four to six hours on each of them; handles all of the details on the procurement and distribution of all of the commercial teleprinter equipment that gets directly into ham hands; spends several days every now and then on a special RTTY demonstration at one such as the election return circuit; and the like. The key point is that John has a store and works at making a living, and he has worked out a rather fixed pattern for handling correspondence (mine as well as everybody else's). Letters that require a personal answer take twice the time and have a paper strip upon which it prints. Use of the 21A instead of the 12 printer results in much quieter operation, though some operators do not like the tape as well as the page print. The 21A does not have any RD and therefore must be used with the model 12 RD or else the RD which comes with the punched tape equipment. The 21A does not have any keyboard or TD either, being just a printer unit, and therefore must be used in conjunction with either a home-made keyboard or a keyboard from some other model machine. The model 14 also prints on paper tape, but it uses a mechanical RD system, thereby requiring only one magnet instead of six. This greatly simplifies the electrical problem of reducing the noise for radio use.

The model 12 clicks have been reduced in several different ways: filters have been inserted in the 12A, and 12 relays do the job. The six magnets of the wiring with shielded wires has been reported successful. The model 12A has just one motor, it being mounted on the printer unit. The keyboard unit has a small gear that meshes with the motor to furnish power for the TD. The model 15 printer unit also uses only one magnet. It has a moving basket of type and the platen and paper stay still. The keyboard of the 12A is activated by the printer motor. The mechanics of the wiring of the tape equipment is similar to the 12, the principle differences being use of a type-wheel instead of a type basket and the movement of the paper instead of the type. The typewriter of John Williams, W2BFD, serves as both a keyboard unit, and a converted typewriter you would have a complete typewriter.

Polar Relays

Bulletin #18 mentioned the availability of some unusual polar relays from a Brooklyn ham. Since these relays are just what we all need, and we are all short of terrific. For $3.00 there is the 7 winding relay with two 110 ohm windings, two 160 ohm windings, two 20 ohm, and one 100 ohm. The relay is extremely compact and is built like a watch. The base is 3/4" wide and the whole unit fits into a 3"x1"x1" handle. Size: 3" high, 1/2" wide, 1/4" deep. Weight: 6 oz. The other polar relay is slightly larger and has two 30 ohm windings. This unit has a banana type plug-in base and is 3/8" high, 2" wide, and 3/4" in thickness. Weight: 7 1/2 oz. It has calibrated screws on the contacts and is very carefully constructed. All of the units are brand new. Please include 25¢ postage per relay, if you are ever going to want a small lightweight polar relay now is the time to get one.
W7TBE, Bill Brunner, up in Seattle, has made the big step and ordered his printer. There certainly is a lot of activity in the northwest. This is a good idea, must I be the one to do it?

W8QKF, Larry Naylor, suggests a rewrite of the original construction instructions for the W2BFD filters, complete with brand names and numbers. This is a good idea, must I be the one to do it?

W7THE, Bill Brunner, up in Seattle, has made the big step and ordered his printer. There certainly is a lot of activity in the northwest, guess there will be no shortage of W7's on 40 meters.

W4KFK, Frank Schwartz, Nashville, has written a nice letter indicating his interest in the tape perforator so that it is independent of the other equipment. I used a 300 ma. selenium rectifier and a couple of capacitors along with a protective resistor. Plenty of room. Now I have a detector panel built up using dual Selectojets feeding twin tuned amplifiers to a control tube output to a 21A polar relay. It can be tuned to any audio frequency, mark or space. It seems to have a very narrow bandwidth and was very easy to build on account of being all electronic wiring.

W6KPK, Frank Schwartz, Nashville, has written a nice letter indicating his interest in the tape perforator so that it is independent of the other equipment. I used a 300 ma. selenium rectifier and a couple of capacitors along with a protective resistor. Plenty of room. Now I have a detector panel built up using dual Selectojets feeding twin tuned amplifiers to a control tube output to a 21A polar relay. It can be tuned to any audio frequency, mark or space. It seems to have a very narrow bandwidth and was very easy to build on account of being all electronic wiring.

W9SPT, George Boyd, and W9JBT ordered machines from John in October and are awaiting their arrival. JU7T has his receiving converter done and is working on the auto-call system. George had quite a bit of experience with teletype equipment in Korea where he was a tech rep for Philco. He likes his column in Q. A fine man.

W8QKV, Leonard Rawles: "I have built a d.c. power supply inside the left hand front of the tape perforator so that it is independent of the other equipment. I used a 300 ma. selenium rectifier and a couple of capacitors along with a protective resistor. Plenty of room. Now I have a detector panel built up using dual Selectojets feeding twin tuned amplifiers to a control tube output to a 21A polar relay. It can be tuned to any audio frequency, mark or space. It seems to have a very narrow bandwidth and was very easy to build on account of being all electronic wiring."

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THE USUAL BOOK REVIEWS

Your eager-beaver book reviewer has been at it again and comes forth with the following glowing accounts of the books read recently.

"THE ILLUSTRATED MAN" by Ray Bradbury; Bantam 991; 254 p.
All in all, an interesting collection of short stories by the best known science-fiction authors written especially for this book. Some, of course, were dull, but some were worth the price of the book.

"U.S. Submarine Operations in World War II" by the U.S. Naval Institute; By and large this book should have been edited from its 577 pages (c.0) down to about 250. There are a lot of very exciting incidents in it, and a lot of trivia. Though you have done much to tell the complete story of the submarines in the last war it falls short for having undertaken such an impossible task. Many of the really dramatic operations are dismissed with a short paragraph or sentence, while others are given fair treatment. Most of the facts from which the stories were written came from the official reports and hence lack the human detail and warmth.

"THE NAKED EYE" by Cebane; Pocket Book 899; 254 p.
Cartoons by Cebane and wonderful. Perishable poems by Joseph Newman; World; $2.75; 136 pages of rather dull poems. Now and then one was as amusing as the rest tried to be, but not often.

"HIGH FIDELITY SIMPLIFIED" by Harold Wellen: Rider; $2.50; 200 pages. Simplified is where a ham can understand it anyway. This is a good book for getting an understanding of some of the fundamentals of high fidelity. It is better than most of the basic theory books giving pictures of component parts and equipment.

"DR. HOWES DISCUSSES: HUMANICS" 104 pages; $2.50.
Somewhat pretentious presentation of excerpts from various talks and discussions of Dr. Ronald Howes. Excellent philosophy, with quite a few new ideas on human beings and mental therapy.

SKETCHES

I would like to run little thumbnail sketches of the active RTTY members in CQ. Items like: who you are, what you do, where you live, what you have done with RTTY, how you got interested in RT, what other interests you might have, etc. Mostly with this sketch there will be a small photo. This sketch can be written by yourself, wife, or another 'RTYer' not modestly rear its ugly head. Anyone in your group deserve credit? Get busy.

While dwelling on this topic I would like to again request that you send in pictures. I still have no good pictures of the CIA, 12, 14, and repurf (etc.).

W3INC, Howard Snyder, is trying to install the Collins PSK circuit in his Collins 31OB, so far with poor results. Any suggestions? He reports that WRJA, Guy Kneckerbocker, is going great guns and his rig is a good look and listen to me telling about amateur radio and amateur radio teletype on the "There's One In Every Family" program. They had a quiz after my spiel in which I went all the way and won a ham-phones and money, $140. On Sunday, January 11th, I made my debut on the Voice of America with a fifteen minute discussion of the new teletype regulations. I gave out our calling frequencies and asked for reports of reception of our signals. We shall see.

PARANOIA

There is a well known psychological principle called "projection" which points out that we see in others more reflection of ourselves than other who does not seem to be trusted himself. What fault do you see in others rather consistently? Have you naturally your suspicions will be well founded. After all, when you treat people with distrust they are not going to bend over backwards to do right by you. There is a greater chance that they will try to "teach you a lesson." This lesson is well taught in that it verifies your suspicions and it is then obvious that your distrust was well founded. Do not frequently do this to the personality of others when you are distrustful of them? We all do it, but frequently are not aware of doing it.

Anent this topic is a certain paranoia that creeps up on people forgetting an understanding of some of the fundamentals of this matter, and hence lack the human detail and warmth.

Another propaganda service of W2NDS is an occasional radio or TV broadcast via commercial channels to the world at large praising highly our mighty works. Dunno if any of you happened to be tuned in on W2NDS on Xmas day, but if you were, you didn't see a good look and listen to me telling about amateur radio and amateur radio teletype on the "There's One In Every Family" program. They had a quiz after my spiel in which I went all the way and won a ham-phones and money, $140. On Sunday, January 11th, I made my debut on the Voice of America with a fifteen minute discussion of the new teletype regulations. I gave out our calling frequencies and asked for reports of reception of our signals. We shall see.

Heathkit

My Heathkit Grid Dip Meter came the other day. I followed the instructions carefully and got the thing together and working in two and a half hours. The decision is that it goes to the scrap heap. It is not going to bend over backwards to do right by you. There is a greater chance that they will try to "teach you a lesson." This lesson is well taught in that it verifies your suspicions and it is then obvious that your distrust was well founded. Do not frequently do this to the personality of others when you are distrustful of them? We all do it, but frequently are not aware of doing it.

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W6AEK, Andy Stavros, writes: "How I got started on this RTTY ... is a long story, but it all began last May when I unknowingly parked my ten meter whip equipped car in front of W6FHD’s shop. I waited four months for my printer and then it took me another four months to complete my panel, but I finally got on two meter RTTY on January 5th with very favorable results. . . . . . . . 33 years old, single, have all my own teeth, work for Lufthansa Corp. as an electronic lab assistant. During the latter part of the war I was installing RTTY equipment for the Air Force overseas... I edited and compiled an RTTY manual for the A.F. back in 1944... I'm all for the RTTY callbook idea... I think the August 1946 issue is something worth reprinting again. It is a TT code chart showing all arrangements... I also have a tape recorder and hope to find time someday to enjoy it with good music... may be we could swap tapes... ordered a ZIA printer... will use as a standby and spare to experiment with electronic keying and distributors..."

W6NRM, Bob Weitbrecht, writes: "I believe that the FCC has given us a fair set of rules for a starter, and the fact that they have invited us to help revise the rules later on indicates that they are wholeheartedly in sympathy with our RTTY experiments. So let each of us write Mr. Slowie a letter of appreciation for all he has done."

Joe Doane, South Bend, has invested in a typewriter (hobby) and is now readable. Joe, an old hand at TT, is busy writing up dope on distributors. He has started construction on his own, mounting it on an old 27UN chassis.

Lou Buck, the patron saint of most Canadian RTTY'ers, should have his ham ticket soon, being spurred on by the new TT regulations.

WIKOD, Al Webb, Holyoke, expects to be active in two meters in a couple weeks. So far W61SZ has been holding down the Holyoke end of TT and from an audio signal a few days ago we can tell that amplitude modulation of a continuous wave (such as that caused by the presence of noise) can be eliminated by limiting. Detection of such a limited signal by an amplitude detector produces no audio, only a d.c. component. On the other hand, limiting of noise alone does not prevent an audio signal after detection. Thus the presence of an audio signal after detection corresponds to the off period of on-off keying and on rectification could be utilized for keying a local oscillating system (or for keying a local d.c. supply for the operation of a teleprinter). The difference between the two systems listed above seems to be that the first depends on naturally present noise such as receiver noise, static, etc., to produce the audio signal during the latter part of the signal, while the second utilizes a blocking oscillator to perform this function."

W6HRM, Bob Weitbrecht: "I believe that the FCC has given us a fair set of rules for a starter, and the fact that they have invited us to help revise the rules later on indicates that they are wholeheartedly in sympathy with our RTTY experiments. So let each of us write Mr. Slowie a letter of appreciation for all he has done."

W6WIL, San Francisco, writes: "Why have not the systems described in the columns been mentioned more often in the amateur columns? A New Noise-Reducing System for Q.0 Reception" by Don Hings, QST June '47, page 23; "Teleprinter Reception with Make-Break Keying" by D. A. Griffin, QST June '47, page 24. Both of these systems make use of the fact that amplitude modulation of a continuous wave (such as that caused by the presence of noise) can be eliminated by limiting. Detection of such a limited signal by an amplitude detector produces no audio, only a d.c. component. On the other hand, limiting of noise alone does not prevent an audio signal after detection. Thus the presence of an audio signal after detection corresponds to the off period of on-off keying and on rectification could be utilized for keying a local oscillating system (or for keying a local d.c. supply for the operation of a teleprinter). The difference between the two systems listed above seems to be that the first depends on naturally present noise such as receiver noise, static, etc., to produce the audio signal during the latter part of the signal, while the second utilizes a blocking oscillator to perform this function."

W2AKE, Ken Henn, reports that some of the west coast gang are getting together a bulletin for local consumption. Bert, W6CL, apparently will do the printing in his shop.

W7PFB, Bob Gregory, wants to put Idaho on the air with TT. Bob is superintendent of the Hydro-Electric Power Plant for the Bureau of Reclamation at Anderson Dam.

Conrad Roberts, who became interested in ham TT while in the Army in Alaska, is now home in Merchantville, N.J. and has a model 21A that he has been using into completion. He hooked up a power supply for it and a distributor, only to be met by a "holy cast" of noise. Now he is working on a keyer.

BOOK AVAILABLE: "Teletype Instruction Manual #26, issue 1, April 1943; Model 19," is available from Fred Pearse, 200 W. Merrick Rd., Freeport, L.I.N.Y. Would like to swap for radio books or money.

W6ZAZ, Benny Hallicman, has his model 12 and expects to be there with us on the low frequencies as soon as the D.O.T. extends the Canadian amateurs the new privileges.

Unofficial, but reliable word comes from Canada that the VE's will get the same new regulations for FSK-RTTY that we have and that it will be effective on the same day as our regulations: February 20, 1953.

W6XPU, George Mellon, is busy building a new panel, having sold his old one to W6SP (who is having a picnic with it and the TT keyer copying all of the commercial signals [R.M.S. available]). George is looking for a Panadapter with the idea of using a 2 kc sweep for viewing the mark and space signals of RTTY stations. He is another member of the multi-project gang and, in addition to his regular job, he is putting in a mobile transmitter, putting up a beam, and installing radio equipment at the St. Paul Airport tower.

W6XTV, Dave Kennedy, now has the last piece of equipment necessary to really speed up traffic handling to the far east; his reproducer. There is still the problem of running a model 12 at 4:30 in the morning to be met. I suggest that although the regular model 12 table appears to be cushioned that tremendous improvement could be had by removing it and mounting the printer on sponge rubber cushions.

I am pleased to report that this month I have had about five times as many letters from newly interested fellows as in the past. The QSL column certainly has been getting the word around. W2HNN, Murray Cohen, has plunged right into the middle of things by building the W2PAT converter out of the January QST. Say, do you think that of course, going to notice that QST is also giving some information on RTTY in spite of the official APR! attempts to restrict our operation to the Novice section of 40 meters. Must be some cross wires there somewhere.

W6MNZ, Bob Quenstedt, has ordered a printer and is interested in helping with the solution to the electronic distributor problem.

W6RQO, George Sensabaugh, has acquired a model 12 and expects to be ready to go with it soon. He is a bit worried about the noise problem of the old monster and is quite interested in finding one of the newer model models that are currently on the market. He has a model 21A that he would like to sell or trade for, by all means let him know. QTH: 1333 Birchwood, Chicago 26. With George going hot and strong there may be more stations getting on the air out in Chicago.

W6XPW, Dave Metal, is still hoping for some interest in 220 mc RTTY.

W6ZKZ, Bob Curtis, is looking around for a model 12 at a reasonable price. Bob works for the Telephone Company and does teletype work so he knows most of the answers. He further reports that interest in TT is on the upswing in New Hampshire with a couple of other fellows in Manchester thinking of going on.

W7NDS, me, needs a couple L291's for a two meter rig (±125A's). I have some L291's and a whole slew of other tubes for swapping, any takers? Also looking around for recording tape. I have a few band pass filters, a bit higher than the RTTY tones, with three toroids in each filter for $4 each. Ideal for band-pass RTTY input filter.

W6WBB/W7TIC has been warming up for FSK operation by copying the MARS net on 400 kc that was mentioned in an earlier Bulletin. W40LL and W6WBB have been copied pretty well in spite of QRM (c.w.).
TO OPERATE A PRINTER
YOU REQUIRE:
1. RADIO RECEIVER
2. SELECTIVE FILTER AND AMPLIFIER
3. POLAR RELAY
4. RECEIVING DISTRIBUTOR
5. 110 VOLT D.C. POWER SUPPLY

MODEL 12: Page Printer complete with keyboard, polar relay, distributors, cover, table, and M/G for d.c. voltages. 110 a.c. input.

MODEL 12: Page printer same as above, but less keyboard.

MODEL 12: Page Printer with base, table, and lower half of printer covered.

MODEL 21A: Tape Printers with covers.

MODEL 12: Replacement PARTS, cartons of them.

ALSO: Multiplex 1A Tape Transmitters.

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