

# Teletype Bulletin 10

APRIL  
1952

A Monthly Publication of the Amateur Radio Teletype Society

Well, my friends, another month is gone forever out of our lives. The FCC has yet to remove the pins and needles from our chairs on the FSK deal. Apparently other legislation is holding up the 40M consideration. We shouldn't be over critical of them though for there are several very important matters pending, such as the television unfreeze (which should spread TVI to every part of the country).

Unconfusing you perhaps: Amateur teletype, in its present expanded form is far too much for any one man to coordinate. Two of us are trying to handle it now, John (W2BFD) and myself. John is handling the distribution of equipment and technical developments, I handle publicity and correspondence. We contact daily on teletype and talk on the phone at least four hours a week; we are pretty well integrated. So there is the set-up, John doesn't answer letters - I do, I don't build equipment - John does. Fair enough?

Many of you have indicated on your information sheets that you can operate on 75M phone. Just so happens that I have a wee mite of signal on there too. Tell you what, I would like to have a weekly sked with as many of you as possible on 3805 - 3815 kc. At random I will pick Thursdays at 5, 10, and 11 pm EST. I'll try to make it each week at those times and say hello to you. If there is any news I could pass that on too. In the past I have worked quite a few of you on the hand and I will be looking for more. If I can get my 807's biased right I might try some more make-break teletype on 80M too. There are still over two hundred information sheets not returned, how can I finish the teletype callbook until I find out who has what equipment? Do it now....!

One rumor that has come to me from a couple of sources I would like to scotch. Teletype on 40M will not be tied to the Extra Class ticket. The FCC is interested in promoting TT, not killing it, and a reasonably fair deal is in store for us.

How many have their model 21A machines working? These little things are cute as the devil, inexpensive, and almost silent. Since the typing unit is the only piece of teletype gear that cannot be home-made it is quite possible that many stations in the future will cut their buying of equipment down to \$25 for one of them and then make their own keyboard from an old broken typewriter. We have already discussed this and the problems of the distributors. A simple converter (ARTT 4027) and a diode FSK (April CQ) would set up an entire TT station. The whole thing could be done under \$50, betcha.

Teletype equipment becomes available occasionally in rather large quantities, presenting problems. For example: a few weeks ago a dozen or so printers were sitting out in Kansas and John had just a few days to get money to hold them for our use. Fortunately W5MXJ put up the money and had them sent to New Orleans, else they would have been sent to John in NYC and then had to be reshipped when someone ordered them, increasing the cost to the buyer or making John pay the difference (as he has done many times). A couple days ago a bunch of 12's and 21's turned up in San Francisco; John won't sleep until they are safe. Suggest that everybody invest in a model 21, get 'em into ham hands.

A message came up from the Washington gang saying that John Gill, W4JCV, has been ill and is now in Florida recuperating. Gill is one of the pioneers in teletype and has been responsible for a lot of fellows getting on the air.

Most of you buzzards are too darned matter-of-fact. Now and then I get a surprise though and rush downstairs and read it to the family. Outstanding in this line I recall letters from W6RL, W6IIV, W3PYW, and W8BAJ. Run down the bias on the imagination and see what happens. After all, when your signal blasts out on 40M you want to have something to say. If we have gone to all the trouble to get the FCC to give us 40M, built up equipment, networks, etc., only to exchange signal reports and the line-up of the rig, then we have wasted a lot of time and effort. Instead of talking about things from antennas to zirconium transistors, why not discuss items from airplanes to Zen Buddhism.

From the Maelstrom:

W5HHA works for the CAA overseas communication station WEK, using RTTY and c.w. WEK transmits a "meteorological broadcast" on three frequencies simultaneously; daytime: 8140, 13624, and 18765; night: 4062.5, 8140, and 13624 kc. RTTY is used from the hour until 13 minutes after the hour, then c.w. repeats the weather material from 15 minutes past the hour until 57 minutes. Station identification is sent in the breaks between broadcasts: "WEK SENDING (date) RYRYRYRYRY..."(etc). These broadcasts contain mostly numbers with none of the special symbols as found on weather keyboards.

W7GLT: "Got a bid in with W2BFD for some equipment and feel like a kid waiting for Christmas." Mac is getting all d.c. equipment so he can install it in a trailer which he intends to buy for the purpose.

W6AEE offered to send a converter to me for testing and comparison with the BFD converter. I called John about it and we are both so darned busy that it is out of the question right now. I sure wish there was someone that could set up a test bench and find out about the characteristics of the various types of converters. Any volunteers? W3NL and W6KLD have expressed their interest in helping with some of the research that faces ARTT, anyone else?

JOHN informs me that the plastic covers that are made for the Webster model 7 & 181 wire recorders are just the thing for the model 21A printer. When in place there is plenty of room for the tape to come out.

W2RWV is busy converting his newly acquired 21A. He stripped the wiring, spark killers, buzzer, and magnet units off, then cleaned the whole works with Renuzit. He painted the case and base black. He is now making a receiving distributor for it and will put the spark killers on that. He offers to answer any questions for you model 21A owners and has commercial AFSK and TT experience to back him up. Callbook QTH OK.

W8BYB has a model 26 and a home designed converter. He asked me about getting a polar relay. I suggested Herbach & Rademan (\$2.95) for the #239 or W6ITH for a #215 (\$5). Rod thought he was the only one in the Detroit area interested in RTTY until I told him about W8HP & W8DLT who are not only interested but have model 26 printers to boot.

W1EVZ and W1RIA visited John recently. They called me about getting a "ribbon throw cam." Might as well expand on that a bit for the rest of the model 12 owners. Normally the ribbon jumps up and down with every letter making it so you can easily read what has just been typed. This apparently gave trouble in the field and most machines have had the cam removed that kicks the roller to make the ribbon jump up, this leaves the ribbon permanently up. These cams are simple to make; here is a sketch showing the shape, size, and use of the cam:  
 Jim is also looking for a bell & clapper.  
 W8SH also wanted dope on the ribbon dropper, making me do the research that resulted in this:  
 Bob has his model 12 cleaned up and printing to itself, now getting set to buff the BFD panel. He strongly suggests that the motors be cleaned periodically; oiling doesn't cure everything yaknow.

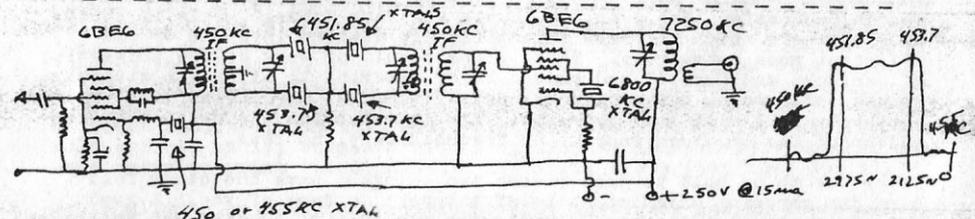


W8LBI has plans to join us on 40, at present he spends most of his spare time putting together a Viking exciter which will drive the big rig and allow a TG7A (15) printer to be used.

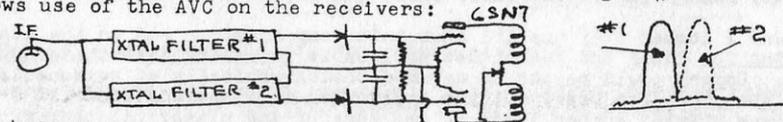
W6CMQ has a bulletin dated 9 March which explains how he converted his Collins 75-A receiver for TT on the lower frequencies with both AVC and AFC. If there are enough demands I will reprint it next month, well?

GREEK to me. Two out of three of the fellows that write to me most often have handwriting that is tough going. After five or six pages of that I am worn out and I can't remember what I just read. Typewriter, TT, or a little slower writing would help a lot, OK? It is very helpful if you put your address in the upper right side of the page too, at least until I get my list of addresses rearranged. I spend a lot of time finding QTHs.

There has been quite a bit of discussion on the subject of how much shift we should plan on using for FSK operation. Letters come from W6NRM almost daily with developments in his thinking on the subject of 200 cycle shift rather than the commercial standard of 850 cycles shift. First I would like to explain why the number 850 was chosen. The upper limit of possible shift is determined by the size of the channel as defined by the FCC. With less deviation there is a concomitant drop in the discrimination against noise. Other factors involved are the production of beat notes when there is multi-path reception, producing tones of 850 cycles, 1700 cycles, 2500 cycles, and 3400 cycles. The normal receiving filters tuned to 2125 cycles and 2975 cycles will adequately reject all of these interfering frequencies even under severe selective fade conditions (multi-path reception). Even if the filters are made quite broad (as they frequently are for commercial work where only noise and fading are trouble-makers) they will still reject the 850 cycle harmonics satisfactorily. Amateur radio teletype will be quite different from commercial in that we will have not only the noise and fading conditions to combat, but we will be having QRM from other stations and much less extensive installations of transmitters and antennas. It may be that the commercials will learn something from us again. If we could expect R9 signals with no QRM then we might plan on using deviations on the order of 85 cycles as is used by many multi-channel stations. Commercial receiving systems are in use that will operate with only a few cycles deviation, deviations approaching the keying speed. Most of the converters in use today by amateur stations use L/C filters and are not readily re-tuned for smaller deviations. A few of the gang are building f.m. discriminators into their receivers (W6CMQ bulletin and ARTT 4028-4029 from W6AEE) This means poking your hot soldering iron in the receiver, which many are reluctant to do. The only argument I have heard against 850 cycle shift so far is that it will make RTTY signals too broad and will cause unrest in the c.w. ranks. Perhaps the only solution to the problem will be to wait until we do get on the air and then see if we can make the narrower shifts do the job satisfactorily. QRM is going to be a major factor, witness the letters from Alaska where they have harmonics of CAA and ACS teletype as well as lots of Radio Moscow all over the high end of 40 meters. Most of the fellows there say they will have to work us on 80 meters, that 40 is just about hopeless.



ARTT 4028 from W6AEE. He adds that he has added a 6AU6 buffer to this and gets almost one watt output from that on either mark at 7253.725 or space at 7252.875 kc. To change frequency change the 6800 kc crystal. This is the AFSK and FSK converter using the present tones (2125 and 2975 cycles) to provide FSK at radio frequency used by W6AEE. Merrill also sent in a brief sketch of an AFSK converter for receivers using a 450 kc i.f. which allows use of the AVC on the receivers:



ARTT 4029 from W6AEE. The unit as a whole can be outboarded.

I have quite a bit of data on polar relay adjusting devices of varying complexity. If there is a demand for this information I will be glad to put it in the next bulletin. Two of the circuits use, respectively, a 150-0-150 ma W.U. type 1A differential meter and a 150-0-150 bridge type meter. If you have these on hand then I might as well print diagrams.

W5RPL, Los Alamos, has been with the CAP for the last seven years. He has a model 12, copies of the 1N/FGC-1 detectors, and has put the 709D-1 circuit into his rig, his KW rig! He is now an electronics engineer for the University of California.

W4RPV, Cookeville (Tenn.), says that interest in teletype is growing in that area and that the gang is enthused with the articles in CQ. That is a good cue for a commercial, eh? When you subscribe to CQ please mention teletype and you will get the special rate of \$2.50 a year, OK? Two years for \$4.50, hoot mon, Perry will have my head for making an offer like that. Now that I am back in New York I manage to stick my head in the CQ offices at least once a week, and even rewrite an article for them now and then. (I did that one on the Codetyper last month). So, if you have any comments pro or con on what CQ is doing let me or Perry know about 'em and they will be appreciated.

Several times I have mentioned that I would like to have some pictures of you, your equipment, or most anything that would look good in CQ. Well one picture has flooded in so far. I'll give you six more months at this rate before you all die of paralysis of the atrophy. One article for CQ has flooded in too and was promptly rewritten and edited into oblivion. You will see it in the April CQ labeled: "The Useful Diode Modulator" by W6NRM. Everybody else sitting on his hands?

W9UAW has been trying the W6NRM VT Keyer on the 21A printer with poor results. The keyer will kick the selector magnets but not the 6th pulse magnet. It will kick the relays that operate them but not for long enough time for them to operate the respective magnets which they control. He still has a few of the gears left for single spacing the paper.

Doane came up with one of the best suggestions for getting a motor to run at 368 and 420 RPM for the transmitting and receiving distributors: Use a small selsyn motor whose voltage would be obtained from a three phase oscillator. Sure wish I had some time to try this simple answer to the problem.

Actually I am not spending all of my time on teletype, just most of it. In the next week or so I expect to publish a booklet for the Music Research Foundation, Inc., called "Music for Your Moods." This is a catalog of music which has been scientifically divided into one of six different mood categories. This is the result of work at the University of Kentucky and Cornell and should be of interest to all radio stations, record collectors, advertising agencies, schools, hospitals, etc. It had better be or I will stay poor, hi! The introduction was written by the editor of the American Journal of Psychotherapy, no less.

Never one to be held to just one or two things I have one other full time job abrewing which might be of interest to some of you. A good friend of mine has invented a radically new type of loudspeaker enclosure which dramatically outperforms every speaker it is compared with. It is fairly small, easy to build, requires no external tweeter, will take almost any size loudspeaker, and faithfully reproduces even the deep bass notes around 30 cycles where almost any other speaker just gives up. This just happened along at a time when the need for a better enclosure is widely recognized in the audio field and should sell nicely.

W2BFD and I looked over the IRE show this year from one end to the other searching for ideas and techniques applicable to making distributor plates for TT. Copper could be put on ceramic photographically at reasonable cost. When the disc wears out you could plug in a new one since it could have printed copper leads to the edge of the plate. Another product that impressed me was the Elco connectors. These are a development of the old Jones plugs and are a natural for ham construction for they can be made into either plug or socket, and any number of contacts you want with a screw-driver. They are small, light, and make tight grip.

W6RL flies again. His excellent mobile setup will be described in the May CQ. It was recently featured on TV at the Los Angeles Hobby Show.

KL7BK wrote from out of the blue to say that he has designed and built his own receiving converter and got it down to the point where the antenna was the limiting factor in receiving, not what was on the back end of the receiver. He has beaten distributor noise by putting the receiver in the basement and having the printer and keyer about 100 feet away. He owns a model 12 (sans keyboard) and has a couple 14s on lend. He too has been working on the problem of the electronic distributor. He tried all relays at first and then shifted to a multivibrator for stepping control through the teletype signal. This apparatus is still mostly in the brainstorm stage though. We have another experimenter enlisted though, and that is the important thing.

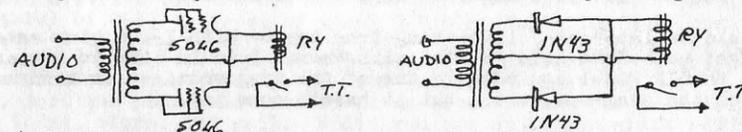
Doane suggests that those stations that are auto-start and have the automatic answering device should also install a page tearer, folder, inserter, and postage meter. The incoming message would then start the printer, be copied down, rogered, cut off by an old paper cutter, folded by an old shirt folding machine (from laundry), stamped by the postage meter, and sent through a chute to the mail box. One extra gadget would register the deed in the station log. Any takers?

W6AEE sent a couple of the filters that he is using in his converter (modified BC733D filter units similar to those described in bulletin 5). John and I will test them in comparison to the filters (W2BFD design) we have been using here in the east. Incidentally filters are available from John for \$16 a set of four. The new ones are 3" X 2" X 2" with two spade bolts for mounting. Delivery: right away. They are a new batch.

King Ross called the other day and offered to make the metal stand-offs for the W2BFD panel on a cost-plus basis, but reasonable. This has been a major problem for me and maybe others have faced it too. I like to use John's type of construction: building on aluminum panels and then mounting them on the standard steel rack panels with stand-offs. This means that you need a metal rod from 3" to 5" long, drilled and tapped on both ends. They are worse than hard to find, even here in New York. Write King: 7022 35th Ave, Jackson Hts, L.I.N.Y. and he will make them for you in the shop in his cellar.

W500M, writing for the Tulsa Radio Club group, says that they have been thinking quite a bit about the practicability of home-made keyboards. They have an interested fellow who is with IBM service and may be able to turn something out soon. I hope so. He also mentions that he was disappointed by the lack of detail in the March QST about the Codetyper. March CQ and Radio News both went into more detail. Dorfman (inventor of Codetyper) tells me that Radio-Electronics (Radiocraft) will carry a full article on it, complete with diagram. Radio News told me that they were going to print the diagram in the April issue (bet they don't).

Got a glimpse at a Philco TechRep booklet last week and in there were the following circuits which should do well for make-break reception or for FSK reception when you tune to zero beat with the space signal.



ARTT 4030 Make-Break jiffy converter, also for FSK.

Guess there is no getting around it, this teletype breeds a friendly bunch of fellows. Just about every one of the gang that hits New York calls either John or myself. Incidentally, my phone number (for those of you that work in the phone company) is DEWey 9-1691. W4RRHV called me from Birmingham and talked for a half hour recently, had a swell chat. W5QDD called a week later giving me my first phone (telephone) QSO with New Mexico. W0HPFU flew down from Minneapolis to see us for a couple of days. W6KLD visited both John and me a couple times while here in the east on business. W3PYF came over one night and we had a swell get-together. W7LUK called on the phone while he was in town as did W1EVZ and W1RIA. Met W0OXX at the IRE show. And so it goes.

A good suggestion on message handling from an expert (Doane) is that many of the failures in messages are in the carriage shifting. When feasible leave the figures for the end of the line, then at the end of the message repeat all of the figures used in the message. This method frequently saves a rerun.

Due to the large volume of bulletins I send out every month it is impossible to separate any one for special treatment (except for airmail), therefore I shall send any stamped envelopes you may send me on to John. Since I get up to a dozen letters daily I have had to work out a standard routine. The letter comes in, is removed from the envelope, dated, checked for bulletin requests, etc., marked in my master log, data extracted for the bulletin and CQ, and answer written if needed, and then filed. When the rush is on to get out the monthly bulletin or the CQ column, or any of several other emergencies, I am likely to mishandle some of the mail and not get it answered, etc. When the emergency clears I find letters all over the place; on the dresser, table, desk, and on the cabinet. Of course now and then I find a letter in the files that I intended to answer but missed. Soooo, if I have given you the cold shoulder that is what happened. You probably got lost in my files. That is my excuse, what is yours for the information sheets????

VE3ATP says that he, VE3TC, and VE3BUO have been on two meters with TT since the middle of January and that there are five more fellows ready to go on soon. Toronto is teeming.

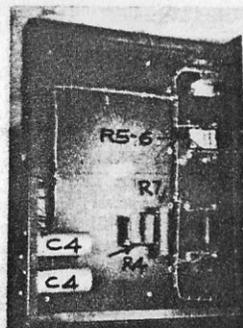
WLEXZ wants to know if anyone wants to swap a model 15 for a BC221AK? W0AGL/5 has just gotten two model 12 printers, one operable. He has applied for a keyboard for them from John and may get one soon.

W3PYW (Silver Spring, Md.): "We grind away down here. New beams, higher power, new exciters, new receivers. I was thinking back the other day as I was in a four way with W4JCV Leesburg, Va., W3PKF Fredrick, Md and W3LMC Baltimors. We were passing it around, using both phone and RTTY with Q5 signals at all stations at all times, well here is what I was thinking: First time I worked W4JCV the signals were Q3; first time with W3LMC they were Q2, and Fredrick, I barely heard him for months, and finally worked him. Now we sit on a frequency and bat it around just like the telephone and forget the not too distant past when it was otherwise. I wonder how often this is duplicated elsewhere? Do fellows work a station, barely work it that is, and call it a day, or do they constantly try to improve, get better signals? This gang down here is always on the go. No lousy dipole antennas, no converted 522 receivers, no 522 transmitters; every one is making or has a low noise converter, at least 500 watts input, at least ten elements, and RTTY equipment to match. We are enjoying RTTY on two meters and the friends we have met and spend our time making new gear and talking to these friends. The new bug is FSK on TWO METERS. We believe that we can work DX consistently if we use FSK. Isn't this much better than just sitting around waiting for the FCC to give us a new deal on a silver platter?"

John would be interested in hearing from anyone with I-196 bias meters that might be talked into parting with them. I would like to have some dope on the AN/FGC-1 equipment. One of the gang promised to send me copies of the diagrams, etc., but it hasn't come yet.

Another diagram I am interested in very much is the psychogalvanometer circuit and the Mathison Electropsychometer. Sold at 1214 West 30th St Los Angeles 7, phone Republic 2-5024. It is made by Arcon Mfg Co. L.A.

In addition to the pictures in the coming April CQ I would like to try this bulletin and see what happens when a half tone is reproduced. Here is a picture of the W.U. keyboard perforator. This unit requires 110 volts, d.c. The second picture is the bottom of the tape gear which is described and pictured in April CQ. This page is a bit tight for room so I will put them at the top of the next page. Couple of corrections on bulletin #9: ARTT 4023: draw line from grid of tube toward left until it hits the next line. ARTT 4027: ground junction of two CuO rectifiers.



← Bottom view of tape transmitter-distributor chassis as described in April CQ.

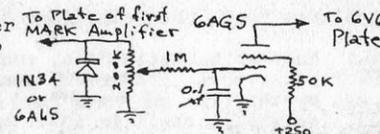
The perforator at right requires 110V DC which is obtained from a socket on the rear of the chassis at left. If you wish to operate both simultaneously a separate 110V supply is necessary for the perf. draws very high current and affects the tape transmitter and distributor operation.



Keyboard Perforator  
W.U. model 2-A

W0KMK is getting ready to pack his teletype gear and rig in the car and visit W6NRM/9. In that way he can get things aligned as well as get a peek through something larger than his 3" refractor. Wonder how many others are interested in astronomy? W0BAJ and I have 3 1/2" reflectors.

Cpl Roberts (Army) sent in this "Carrier control mark hold" circuit. This is to prevent the printer from running "wild" if the incoming signal should fail for any reason. When the signal is absent the negative voltage on the grid of the 6AG5 will be reduced to zero causing it to conduct, producing the same effect at the 6V6 plate (W2BFD's panel) as exists when a mark signal is transmitted. As soon as the carrier comes on the printer begins to print. Adjust the potentiometer so that only noise coming into the panel will create the mark hold.



ARTT 4031 "Mark Hold"

Copies of bulletins 2-3-4-5-6-7-8-9 are still available for a slight fee, if you want or lack any of these drop me a line for I am getting tired of filling up the pigeon holes of my desk with them.

Since the June column for CQ is due soon I will have to start to work on it. I would like to be a bit more dramatic this next time and work a bit harder on "selling" teletype to those that know little about it. It would be very helpful if I had a few anecdotes to put in. What thrills and excitement have you had from teletype? Sit down to your printer or typewriter and get in practice for 40M, send me a letter.

\$ I am happy to say that the request for some funds in the last bulletin did not go unheeded, seven people sent in money. My heartfelt thanks to them and a cool hello to the others. Here is how it works out in the sixth district for example: Of 96 subscribers 22 have given \$1 or over to a total of \$51. A total of about 600 plus bulletins have been mailed to these 96 costing an average of 25¢ each, or \$150. There is, as you can figure, a deficit. The W6 district is at present a bit above the other districts in donations though: 29% have sent something. Tell you what to do, just put your call letters on an envelope and put in a dollar, address it to me, stamp, and mail. While you are at it you might return the info sheet too.

W2MIB is moving his TT gear to his new home and expects to be able to get on the air again soon. Glad to hear from the Doc, hope to work him soon.

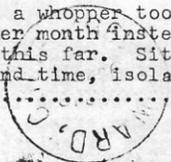
W2MYL says that W2PCQ, the two meter DX'er up in Middletown, N.Y., is getting more and more interested in TT and may be on one of these days. He has a wonderful location up there and can work from Philly on up to Troy easily.

Me? I'm almost 30, still single (or I couldn't support the bulletin), overweight (a bit), and have a wide range of interests: Pogo, cooking, eating, television, radio, submarines, General Semantics, Krishnamurti, good books, astronomy, Tesla, psychology, science-fiction, Gamesmanship, music, hi-fi, Gestalt, Gilbert & Sullivan, philosophy, geology, DX'ing, six metering, cartoons, the New Yorker, painting, singing, women, and amateur radio teletype.

Most of my extra time (?) is now being put into the writing of a book on teletype. I am trying to make this a complete volume that will cover every aspect of amateur teletype and serve both as a text book and as a handbook. Naturally this is going to take a lot of time, I figure about two months of solid work. I need help on this though if I am to get it done while we are all still young. Are any of you able to draft diagrams into printing quality? I can do it but it would add another month to the job at least for there are about 40 diagrams that must be drafted. More than four of the gang can do this or have people working for them that can do it, I know. I need pictures of the model 14, 15, 19, 21, 24, 25, & 26 printers. Even more than that I need to know what you want to have in the book. Send me the questions that should be answered, things that have puzzled you about teletype. Send me the dope on how you beat certain of the problems that jump up in this new field, etc. The more dope I get the better the book will be. If you have information saved up in your files then make a copy of it for me so everyone else can have the data, hokay? The book will be 96 pages according to present plans, and it may be a lot bigger if some of you scrounge around a bit.

Any of you read "The Mechanisms of Life" by Dwight Bulkley, Claremont, Cal?

Whew! Another bulletin done, and a whopper too. Maybe I had better cut back to just post cards every other month instead of all this. You need a rest by the time you have read this far. Sit back, relax, close your eyes, isolate yourself in space and time, isolate yourself from the world around you, relax.....



Wayne Green, W2NSD  
1379 East 15th St.  
Brooklyn 30, N.Y.

Return postage guaranteed.

Please forward if necessary.

**Ernie Hammer,  
227 Toni Court  
Hayward, Cal.**

**W6HSW**

11030 Via Flores  
San Bruno, Calif.  
(dms)