



# AUDIO OSCILLATOR, VARIABLE FROM 2,000 TO 3,000 CYCLES

FANTI Dott. FRANCO, IILCF

Via A. Dallolio n. 19, Bologna, Italy

The project described in this article is the classical circuit for an audio oscillator, and in fact, I have made only a few modifications, and the description will be of interest to RTTY amateurs. He will find this unit to be very helpful in taking resonance curves of various filters, setting frequencies of AFSK units, and other tests where a stable audio source is available.

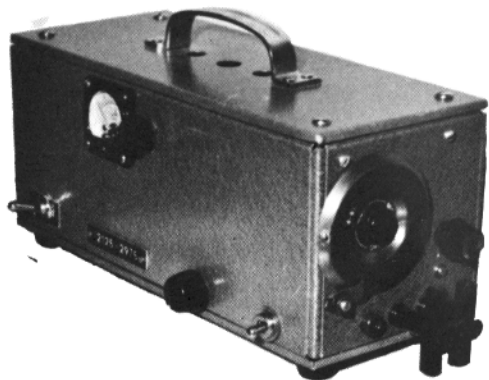
Features of this unit are ease of construction, adjustment, and cost of parts. The unit does not require much explanation, and only unique feature is the use of a variable inductance, which permits one to obtain variable frequencies from 2,000 to 3,000 cycles.

Some explanation of the construction details of the variable inductance will be given, but the photographs clearly details it, so a minimum of details will be described.

The movable portion of the coil is a ferrite core from a transistorized receiver antenna coil. There should be clearance inside the coil to permit free movement.

The mechanical dial assembly is from a BC 654 (a unit which is easy to locate on the Italian surplus radio market) that has a gear ratio of 30 to 1, with double gears and backlash compensation. The plates of the capacitors were removed, and one section of the shaft was saved for driving the ferrite core. A cam was then placed on the shaft to drive the core. The drawing will give necessary details. You will note the cam drives the transfer lever, which in turn drives the core, in and out of the coil. I believe the design is clear.

In adjusting the unit, replace the "R" with a potentiometer of 1.0 megohm which will be replaced with a fixed resistor after adjustment is made.



COMPLETED  
OSCILLATOR

The capacitor "C1" (2180pf) is the result of numerous tests, and provides the variation from 2,000 to 3,000 cycles. There may be some variation, but final frequencies should be close to these values. Adjustments were made using an oscilloscope and Lissajous figures.

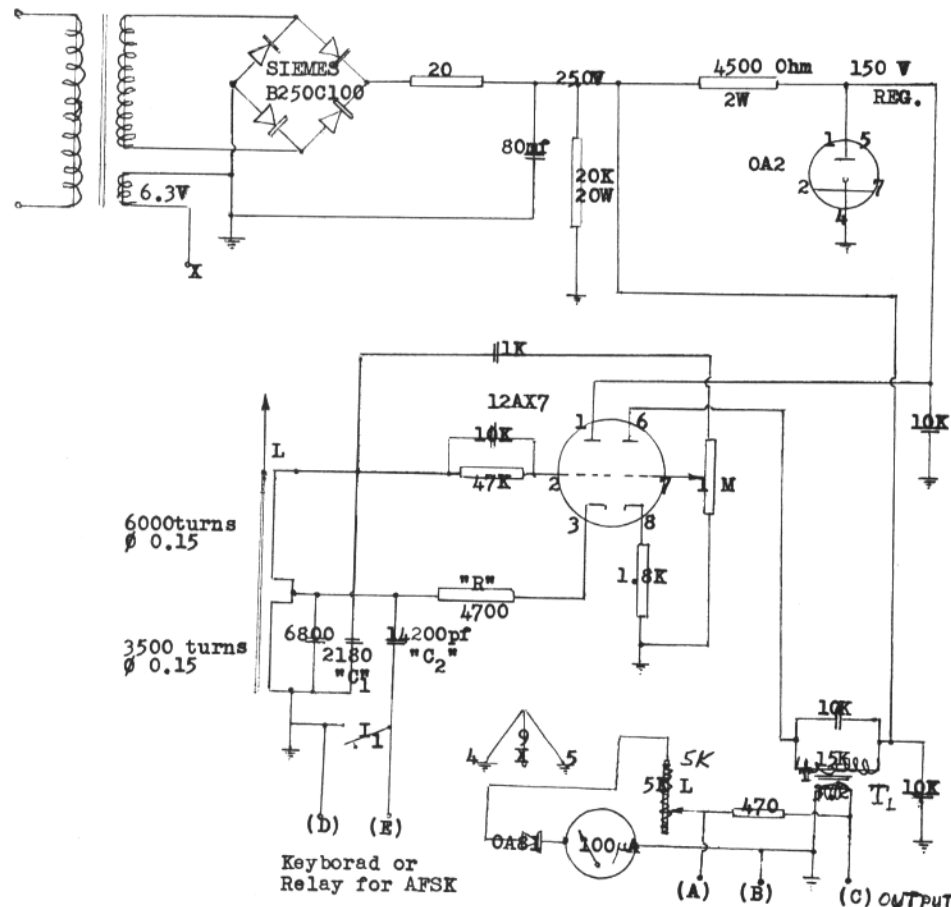
Set the potentiometer to low end (1 megohm) to obtain sine wave form. The 100 uA meter is used to take filter curves. The switch I1 is used to change rapidly from 2975 to 2125 cycles. For AFSK operations "C2" is used. The output transformer is a Geloso with a ratio of 15,000 to 3.2 ohms.

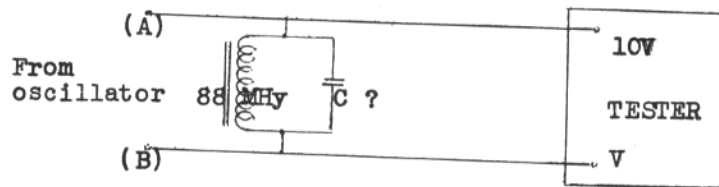
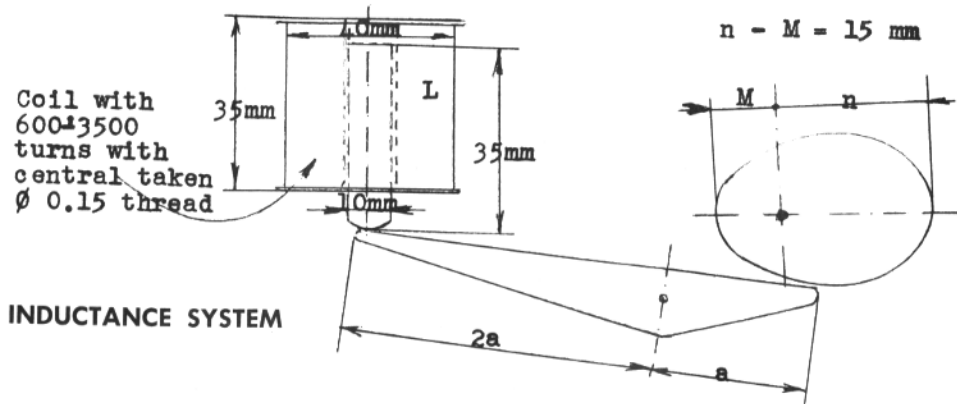
In testing filters, it will be found to be easy since the output of the oscillator is relative high. I have found that it is possible to use a Volt-Ohm-Meter rather than the 100uA meter. A sketch shows connections in this manner. Through B-C it is possible to connect a speaker or to connect to the converter, providing the Mark and Space tones. In adjusting the filters, this is a "first-try" and final adjustments when filters are operated in the converter.

Please note the eccentric cam is made to operate in one half turn, so slowly tune from 2,000 to 3,000 cycles, and in the second half turn, rapid change from 2,000 to 3,000. I hope this description is clear and for details not mentioned, see the front of the unit in the photographs, and exactly the disc. I marked the dial of the unit in cycles during the adjustment, to make easy use of the oscillator. Best 73 and SK-IILCF.

*Ed. Note:* Franco requested that I make some correction to his notes, so if errors did slip in, it's the Ed's fault, not Franco's.

AUDIO OSCILLATOR  
FROM 2000 TO 3000 CYCLES





FILTER USING SAME VARIABLE



## THE TRIALS AND TRIBULATIONS OF AN ANTENNA RAISING

WA6WGL

714 Evanwood Ave., West Covina, Calif. 91790

It all started when I heard of a nice 54 ft. tower for sale, complete with a good rotator. Being sick and tired of listening to W6CG and W6AEE working all that rare DX, I decided to use part of my Christmas bonus to buy said goodie. Now right there, I ran into my first snag. The dirty guy wouldn't take my turkey! Anyhow, I finally convinced the XYL that the only way I'd be able to keep body and soul together, was to rob the kitty, and get this little gem. Sooo, I collected some of my buddies, borrowed a company truck, and picked 'er up.

Now, so you'll know how my problems started, I'll fill you in on the QTH here. It's one of the typical Californian suburban homes, with a lot only enough larger than the house to keep the FHA and local inspectors happy. Since I'd been using a 35 ft. telephone pole, and a umpteenth-handed Triband beam, I'd just about decided I wasn't getting my share of the DX.

After the usual problems associated with raising a tower, I got out the hooks, and went up to take down the 'ole beam for the last time. After getting it down and apart in the garage so I could clean it up and retune it, I found the traps are virtually non-existent, the elements only staying up by virtue of all the hot air coming out of my shack.

The XYL being numb by this time, I dash out to the local Emporium and purchase a beautiful "Brand-X" beam. After getting home, we set down and open this large, heavy box, and marvel at all those itty-bitty pieces of shiny aluminum. Promptly hauling out the instruction book, I set down to read this little gem. I begin to suspect a "Woods Kitty" when I try finding the "bundle marked ten element director", when there's nothing but loose pieces of tubing filling the box. After an hour or so of sorting all these pieces by O D and length, and cross-matching with the voluminous parts list, I finally had all the danged things grouped by element.

Now these guys are pretty dang smart. They show you three suggested ways of raising the completed beam, and getting it up on top of a tower. Unfortunately, the pictures were obviously taken on some half-section Kansas plains, and not in my back yard, surrounded by service drops, trees, house, and of course one nude pole about ten ft. from the tower.

After much head scratching, I decided the only way out was to make up the boom, and

all the individual elements, stand the boom vertical, and tie it off to the tower. I would then be able to assemble the elements one at a time starting at the top of the boom, and then by raising the boom, I could gain enough clearance over the roof to put on the next element. This worked swell for the first three elements, but then it began to get top heavy so I had to think of something else. By this time it had started to rain off and on, and the tower began to get slippery, so I came down to get on the outside of something warming. Going back up, I decide that since the mast is already in place, I'll take the boom apart and put it up a half at a time. After much mumbling, and the judicious use of my hidden stock of cuss words, I finally get the fish-plate slid down over the mast, and properly guyed up. I got the bald half of the boom in place and guyed approximately, then came down sopping wet again by the last sudden shower. I had it figured out that I could get the fourth element placed by leaning out from tower, and the last two by leaning out off the telephone pole. Also by this time, I figured everything had gone wrong that possibly could.

Now I want you to know, that I've got a pretty doggone good bunch of neighbors around here, and they have finally gotten used to seeing garage lights on at all sorts of ungodly hours, and even an occasional bit of TVI. They've gotten used to this, but this was just too much for them. I'm sure they called up all their friends to come over and "see the silly jerk out in the rain puttin' up an antenna." It must be, or why would all the cars be stopping out on the street, and arms pointing up at me and much head shaking?

Anyhoo, I'd decided that no doggone hunk of aluminum was going to lick me, so back up I'd go, put on half an element, then come down to dry off the outside, and wet up the inside. Finally the job was done, the last bolt tightened, and the match in place and fed with co-ax. Down I go for the last time to fire up the ol' pulverizer, knowing full well that the least I would do was to moonbounce on twenty, and pick up Lower Slobbovia. I find myself a hole, put on my best CQ tape, and then set back for the DX pileup to stop. Who comes back but W5XYZ, so since it must be early for Slobbovia, I figger I'll kill a little time with this guy.

Continued . . .

## A VISIT TO W7ARS

W7ARS is a call well known to most RTTY operators on the 40 and 20 meter bands. This station, operated by Walt Nettles in Tucson, Arizona, will be usually found nightly, during the early morning hours after midnight, handling much RTTY traffic between servicemen stationed in the Antarctica and their families. Hence it is interesting to pay a visit to this station and to get acquainted with its operator.

The Nettles ranch is located about five miles east of Tucson, on the Tanque Verde Road leading to the mountains. The land out there has been divided into 5 or 10-acre blocks and some of them are now occupied—but yet there is plenty of land and space in that part of the country. The area is typically Arizonian semiarid, with cacti and other desert vegetation abounding. There is a “dry” riverbed passing through this country and there is plenty of water underground. In fact, the water table, normally some 80 or 100 feet below the surface, had risen to within 15 feet of ground level due to runoff from heavy snow deposits in the mountain area during the previous winter-spring season. Hence it is not surprising to find verdant growth on the various properties. Already in existence are various horse and cattle ranches, along with fruit tree groves. The climate is relatively hot in summer, but agreeable due to the low humidity. Extensive use of air conditioning in homes and buildings make for a pleasant existence out there. The “rainy” season is brief, usually during the months of July and August, with frequent spectacular thunderstorms along with their surge effects on the public utility power grid in the Tucson area. Hence this makes for an interesting life out there; one can take horseback rides, just hike along the riverbed, or go up into the mountains.

The two photographs show Walt's station

and home. The tower outside rises some 100 feet and it carries a set of Yagi arrays tuned for 40, 20, 15 and 10-meter bands. Inside, there is a KW-1 transmitter along with a variety of teleprinters. The receiving equipment consists of a Collins 51S1 receiver along with special W7ARS-developed terminal unit of proven performance on a variety of shifts from 850 Hz down to NFSK. There is a stand-by gasoline powered 5-KW alternator to take care of main power outages due to lightning, which as before mentioned, occurs rather frequently. Even the tower with its beams has been struck by lightning, and as a result all coax cables have had to be replaced. However, there is no question whatsoever as to the excellent results that Walt gets with his equipment, operating on most all bands with this antenna setup plus an inverted Vee and a vertical set up in the rear of the property.

The Nettles family are from Denver, Colorado, having recently moved down to Arizona. Walt's former call was WØAJL, and he too was active on RTTY from that station. There are three horses, one goat, and two dogs, along with a bunch of cats living with the family—all having a wonderful time. The children are very much of the outdoors type. Lots of wildlife there, too, including the inevitable rattlers and scorpions. One time Walt was describing the antics of their cats to some lady RTTY operator in the East. There was a misunderstanding—the other operator got an impression that Walt relished eating scorpions. Actually the cats are the ones who do the digging out and eating these arachnids with no apparent harm to themselves. Sure got a chuckle out of that! I wish to thank the Nettles family and W7ARS for their kindness and hospitality during my visit there.

R. H. Weitbrecht—W6NRM  
1966 Woodside Road,  
Redwood City, California.

### TRIALS AND TRIBULATIONS (Continued) . . .

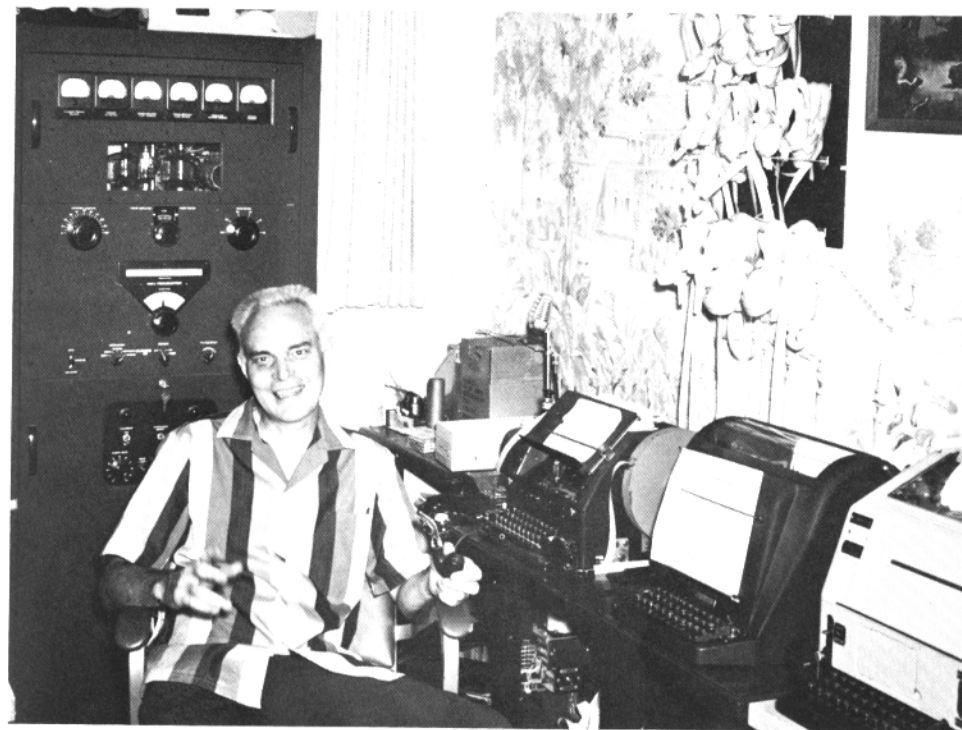
—“WA6WGL DE W5XYZ . . . Hi Bob, what's wrong with the rig? Your signals usually ten over down here, but I can barely copy you today.”

Well, the Doc sez I should be out of this straight jacket in about a week, so next time you hear a weak signal, give me a call.

73 DE

BOB, WA6WGL

P.S. There's really not too much embellishment to this tale, and I have enough witnesses to certify my commitment.



**PLEASE NOTE: RTTY subscriptions are being accepted through December 1966 only. If your subscription expired between this date and December, send amount equal to number of months times 30¢ surface mail or 40¢ for airmail. No exceptions will be made. Be sure and include your call if you have one, as well as your Postal Zip Code. Thanks, RTTY, Inc.**

**K2DCY AUTHOR OF LAST MONTHS FILTER ARTICLE**



## K8YEK

I finally got my QCA Award No. 11 and first in W8/K8 district. I have enclosed my cards for the WAC-RTTY Award. Hope everything is in order. Made the mistake of gluing the QSL cards with rubber cement to the wall, I have inserted waxpaper between the cards so they won't stick together. Please insert the paper between cards when sending them back to me.

Enclosed are a few pictures showing the station here.

The 4 chassis the TT/L with autostart which I have built. The individual unit construction makes it easy to modify, that is make major modifications, without having to rebuild the whole works. Another pix shows the workshop and Model 19 for experimental TU work. In the shack I have a "home brew" 19 consisting of a 15, a 14 reperf. and a 14 TD mounted on a table. A switchbox selects all different operating facilities, i.e., making



tape, reperforming and tape transmission besides hard copy.

In the center shelf on the left hand side is the W2JAV tube type work horse. Right on top left of the scope is a home brew frequency standard. All transistorized flip-flops decade dividers, home brew printed circuit plug-in units and temperature controlled X-tal Oscillator. Outputs are 100-50-10-5-1 KHZ. A new standard using Fairchild integrated circuits is in the making. Also will build, in the near future, a counter with binary readout for up to 10,000HZ for RTTY work; total cost to be less than \$90.00. This project may be of interest to RTTY'ers.

Have talked to Kurt, HB9ET, and he has faithfully promised to send "another" QSL to you - hope you receive it soon!

By the way, worked EI6D, Leo, on 7-9-66. He is the only station in Ireland.

73,

Peter, K8YEK



Qst De Paoaa—national Dutch amateur radio station—Vernon—(IARU)—freqs.: 3.600, 145.347.

Ted Double writes he moved into his new home with his bride. He has got very busy and has not got time yet for the hobby, but he hopes to be listening fone or CW within short time, but RTTY will have to wait he is afraid, because of the noise . . . a photo of his old shack is in the July issue of Short Wave Mazaine for which we unfortunately have no subscription . . .

No reports on RTTY from outside the Netherlands received last week. Everyone seems to be on holiday . . .

Writings about RTTY, Inc., August—the W7LHL TU—This radioprinter terminal unit is an audiotape limiterless converter that utilizes the latest techniques at a moderate cost. The terminal unit has the following features:

1. All solid-state circuitry using inexpensive transistors.
2. Unit directly couples to the receiver speaker output.
3. Choice between 170 or 850 cycle shift.
4. Operation on mark only or space signal only or both mark and space signals at machine speed or hand typing speed.
5. A 20 DB per octave low pass filter.
6. Automatic lock-up circuit to keep the printer from running open on either mark or signal.
7. Noise threshold circuit (auto start).
8. Copy either normal or reverse copy.
9. Minimum number of controls on the front panel.
10. No circuits are critical to supply voltage.

The Netherlands. Following station has to renew his RTTY license this month: S. A. Blommaart, Pamlb, Hulst. Did you already apply for a RTTY license? ? ? ? No? ? ? Do it now . . .

Denmark. We received a picture postcard from OZ8O on vacation at the Cote D-Azure . . . hope he has better weather over there.

End of bulletin of PAOAA national Dutch amateur radio station.

Reports on our transmissions are very appreciated. Send them to the first operator: Piet Vanoweerlee, PAOYZ, Diefsteeg 17, Leiden, The Netherlands.

Merrill—

*I picked this up from PAOAA today, Friday, August fifth. Please note the reference to the W7LHL TU which they describe above. The Dutch are fast workers. since I only received the new issue of RTTY containing the W7LHL TU by air mail this week.*

Ed, K3GIF.

As this is being written, IICAQ/MI is operating from the Republic of San Marino, on approx. 14,098 kcs. with a fair signal on the west coast.

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Reference is made to the listing of authorized clubs which have been assigned the responsibility for distribution of Western Union Surplus teletype equipment which was provided in August RTTY, beginning on page 7. Each club is responsible for a defined geographical area which is outlined hereafter:

*Central Location*—Syracuse, New York. *Area of Responsibility* — New York State except NYC area. *Central Location* — Boston, Mass. *Area of Responsibility* — States of Maine, NH, Vt., Mass. and Conn. (Use map as reference).

I have now been able to certify clubs to handle additional areas and therefore the listing I sent you has been corrected and updated as follows:

Listed in order: *WU Responsible Individual, Certified Club, and Amateur Radio Individual to contact.*

*Denver, Colo.*, A. Rabinoff, 1339 Osage, Denver, Colo — Arapahoe Radio Club, Littleton, Colo. — Glen R. Glascock, 2855 South Elati, Englewood, Colo.

*Cleveland, Ohio*, R. E. Givens, Room 532 Roase Bldg., 2060 East 9th, Cleveland, Ohio —The Buckeye Shortwave Radio Assn., Akron, Ohio — Elmer D. Sowers, Buckeye Amateur Radio Assn., 1548 Sunside Drive, Akron, Ohio.

The Cleveland listing is a change of assignment to better organize responsibility in Ohio (a club nearer Cleveland than a Club in Dayton, Ohio).

*Nashville, Tenn.* C. W. Cooper, 218-A Exchange Bldg., 311 Church Street, Nashville, Tenn. — Wilderness Road Amateur Radio Club, Danville, Kentucky — Ronald L. Whitmer, Chairman, RTTY Committee, Wilderness Road Amateur Radio Club, Rural Rt. 4 Harrodsburg, Kentucky.

*Birmingham, Alabama*, R. C. Sandifer, 405 First Avenue North, Birmingham, Ala. — Huntsville Amateur Radio Club, Inc., Huntsville, Alabama P. O. Box 423 — Mr. Sam Davis, 3900 Roebuck Road, Huntsville, Ala. 35810.

I have not lined up a Club to handle the South Carolina-Georgia area, but have one in the mill. So far no inquiries at all from Houston, Texas, for South Texas distribution.

73,  
FRANK WHITE, W3PYW  
2706 Harmon Road  
Silver Springs, Maryland

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This is to let you know that I am still looking for RTTY contacts on 10 meters. I have worked KA9AK, Cas, and he is all set and ready to go.

According to CRPL's October Propagation Forecast, the 10 meter band should be open from 2200 to 0200 GMT. South America should be in from 0200 to 0600 GMT, and Southern Europe should be in from 0800 to 1100 GMT, as should South Africa.

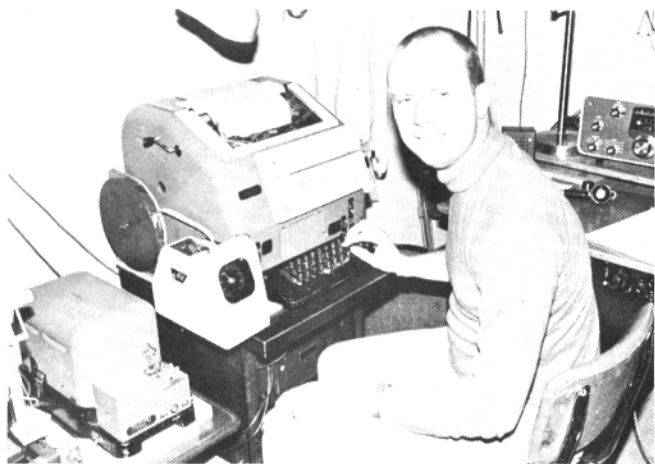
I will be looking for contacts on 29,020 kcs. If you hear me on 28.6 mcs SSB, break-in and I will QSY to 29,030 to try RTTY. This is essentially the time of the RTTY SS as it falls on same weekend as the CQ WW Phone contest.  
73, Ron, KA2RJ

RTTY received the Summer 1966 issue of the B.A.R.T.G. NEWSLETTER NO. 35. It's a real fine issue and reflects credit upon its editor, G2FUD. The annual subscription rate is \$2.00. A. W. Owen, G2FUD, 184 Hale Road, Hale, Cheshire, England.

The line up that is visible in the photo includes the Model 19, TD, and a corner of the Model 15. In the background you can see the SB-400 and the control head for the ARC-33 (UHF aircraft monitor). Other gear not visible includes: Drake 2-B, SP-600, CV-89 converter, W2JAV transistorized converter, and homebrew polar relay interconnecting panel, plus the outdoor necessities namely the cubical quad.

As far as I know, I am the only active RTTY station in the VO2 area since K7SFL/VO2 became K7SFL/4 several weeks ago. Usually operate from about 1900Z until the band closes (20 meters, 14.092 mc) on the week days and almost anytime during the week ends.

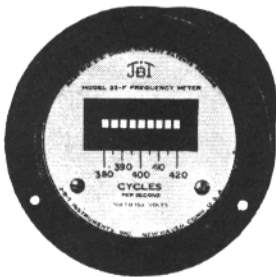
73  
Paul W. "Doc" Terrell, MD  
Capt. MC USAF  
W8NTZ/VO2



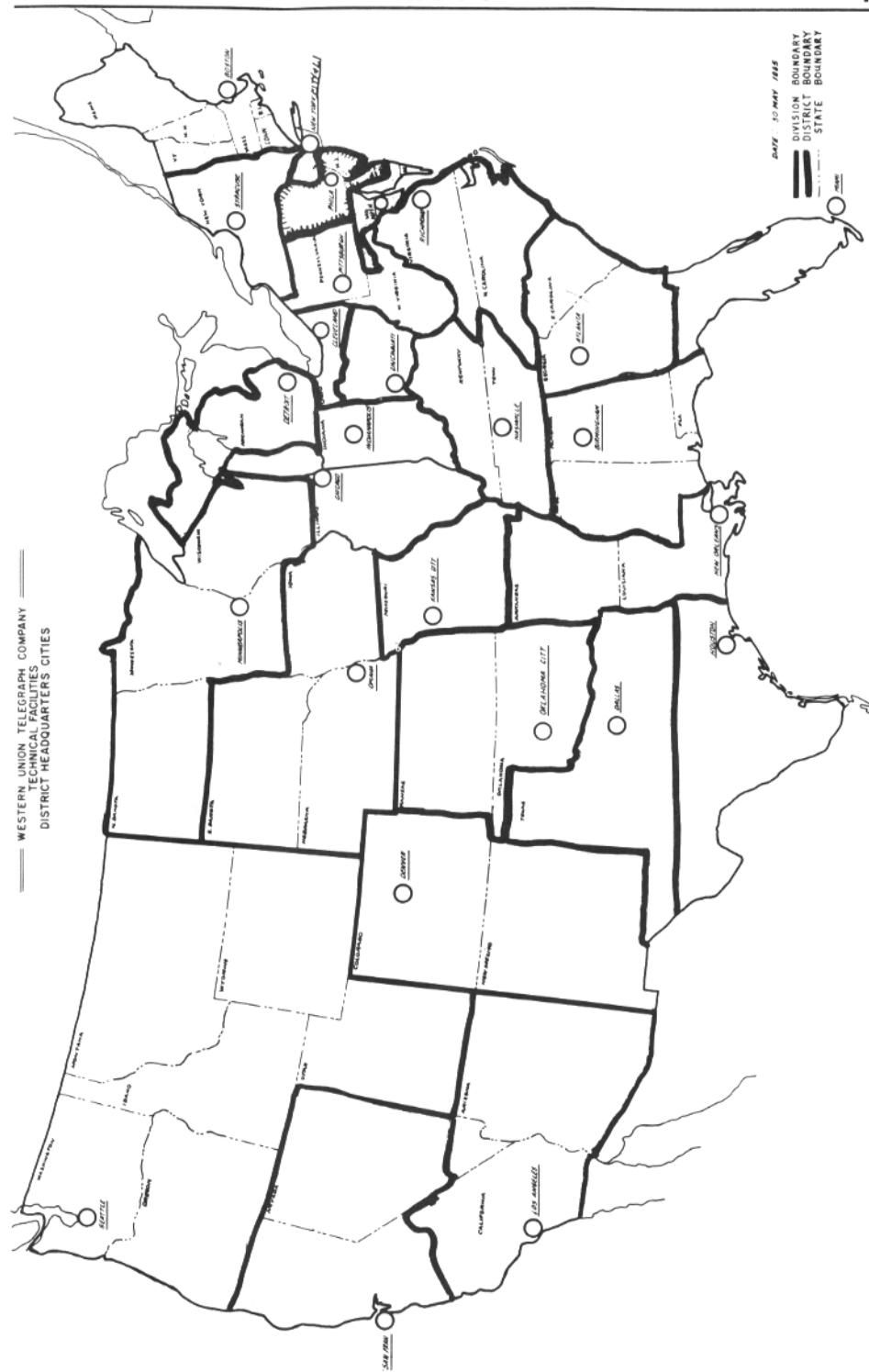
## USING A 380 TO 420 CPS FREQUENCY METER FOR CHECKING SHIFT

### GEORGE ROGERS VE2HL

I connect a vibrating reed frequency meter to the 500 ohm jack on the RCVR and turn on the crystal calibrator. Then beat my space signal with the 3600 KCS output of the calibrator so that it is 415 CPS higher than the calibrator freq. Then I put in a continuous mark and adjust it for 415 CPS lower than the calibrator. This gives me a shift of 830 CPS which is as wide as I dare go with the upper limit of 850 allowed in Canada. The freq. meter requires a lot of audio power to operate so one has to pick a calibrator harmonic that is strong enough to give maximum audio output. The BFO in the receiver must be off or there will be a third tone to confuse things. If you can find one cheap in a surplus store you could get up to an 850 CPS shift this way.



**W8NTZ/VO2**



## DX-RTTY

EDWARD S. CLAMMER, K3GIF

5040 Avon Drive, Bethesda, Maryland 20014

There has been considerable interest in the recent Volta Contest winners list. This writer has spent a good amount of time in the past two weeks trying to find out the results of the contest but without any marked success. They must have the list under lock and key. Last night I dreamed I found the key and opened the box and this is what I read:

Winner with 25,760 points is Giovanni, 11KG; second is Arthur, ON4BX; third is Lou, 11ORS; fourth is Alec, G3MWI; fifth is Josef, DJ6ZBA.

The list started to fade near the end and when I woke I couldn't recall whether Alec or Josef was fourth—but anyway by next month we will have the complete answer—I hope—and you can see what a dreamer I really am.

The following item is from Bud, W6CG, who with his wife Alma, are now on a trip through the northwest.

VS6AZ in Hong Kong was recently visited by George, KH6 EM, who reported to Bud that Om Kwong has a nice RTTY layout with a pair of 19s and an old W2JAV TU. While VS6AZ gets good range and copy on his local loop he is not readily able to print outside signals. George reports that Kwong is hot to trot on RTTY as soon as he gets his TU working. We could really use some good Asian DX these days.

Two DXpeditions have swelled the RTTY countries list during the past month. Peter, GC3PLX, ran a very successful setup from the Isle of Sark, Channel Islands during about ten days in mid-August. QSL direct to GC3PLX.

The second one was run by a triumvirate operating from San Marino starting September 11 to run until the 15th. The three are: Alfonso, I1CAQ; Mario, I1AMP and Gerardo, I1SGS. At exactly 1630 GMT on the 11th on came I1CAQ/M1 and promptly worked LA1FH followed closely by an SM 0 and then K3GIF. Their sigs were excellent.

We owe a large vote of thanks to the G and I fellows for these two fine examples of well performed RTTY DXpeditions.

Undoubtedly the most active RTTY DXer is Jean, FG7XT. He claims 63 countries worked on RTTY using the BARTG countries list. Jean is presently setting up a receiving station which will allow him to print pictures sent by the NASA/Weather Bureau satellites Tbus, Nimbus and Essa. This is of practical use in Guadeloupe since they lie close to the autumnal hurricane belt. Information on such a system can be had by addressing: Weather Bureau, Washington.

Adolfo, LU8DR and Horacio, LU1AA are keeping Argentina on the RTTY map. Anyone

needing South America for their WAC will improve their chances by arranging a sked with either one of the LU boys.

The latest Brazilian to grace the twenty meter band was Victor, PY2CKK of Sao Paulo. As with most Brazilians he puts out a strong signal.

Jean, FG7XT reports hearing some rather badly distorted signals from an HK station. The HK apparently does not copy CW and since Jean cannot print him he will try to raise him with SSB next time he hears him. By this means he (Jean) hopes to improve the HK's signal.

There are apparently two or more different systems for country count now in use. The first one was from ARRL which is regularly published in "QST" and the Amateur Call Book. Another is the BARTG system which counts VO and some others as separate countries. Now it should not be necessary for anyone mentioning his RTTY country count to have to explain which system is used. So I would suggest that we confine our country count to the ARRL system, leaving the BARTG to be used for QCA award determination.

Henry, ZS1FD, writes from Cape Town that the band condx there still have not improved. October should feature the reopening of this north-south path which will again enable us to work Henry as well as the Johannesburg RTTY stations. A relatively large number of RTTY operators still need Africa for their WAC so the fall openings may provide an answer to their problem.

The recent BARTG RTTY contest was reported in the June 1966 RTTY, page 12.

During the past half dozen years, it has been this writer's pleasure to contribute to this column from time to time. This should be my last effort in this direction. After more than fourteen years as editor and publisher of "RTTY", Merrill and Margaret, his wife, are forced by normal demands on their time to give it up. I feel, as you must, that we owe them a tremendous debt of gratitude for carrying on the work on nights and weekends when the rest of us were enjoying ourselves. The magazine began with a handful of subscribers and rose in circulation and rose to nearly 2000. It has been the RTTY man's bible from the very beginning.

So, thank you Merrill and Margaret, for a fine job well done.

Whoever may decide to carry on the job next year will have my support and deserves yours as well. As W6AEE found out, it is surely hard work and his reward is more likely to be spiritual than monetary.

Now, 73 K3GIF

## WAC-RTTY HONOR ROLL

- |             |            |
|-------------|------------|
| 1. VE7KX    | 41. W6LVQ  |
| 2. W6CG     | 41A. LU1AA |
| 3. K6OWQ    | 42. W8CAT  |
| 4. W6AEE    | 43. W6MTJ  |
| 5. W7LPM    | 44. W7VKO  |
| 6. W2RUI    | 45. W6NRM  |
| 7. W2JAV    | 46. W4AIS  |
| 8. W6TPJ    | 47. W7UKH  |
| 9. G3CQE    | 48. I1AHN  |
| 10. W6LIP   | 49. K8MYF  |
| 11. W7ESN   | 50. ZL1WB  |
| 12. W8JIN   | 51. W4GJY  |
| 13. K3GIF   | 52. KP4AXM |
| 14. W5BGP   | 53. VE3BIJ |
| 15. W0NFA   | 54. W2MXN  |
| 16. W8UUS   | 55. SM6CSC |
| 17. TC9AD   | 56. W3KDF  |
| 18. KR6MF   | 57. KR6BQ  |
| 19. K4JXG   | 58. W7JWI  |
| 20. W7FEN   | 59. W1GKJ  |
| 21. W6FYM   | 60. DL1IN  |
| 22. W1BGW   | 61. W13SE  |
| 23. ZS6UR   | 62. SM5KV  |
| 24. VK3KF   | 63. KH6AX  |
| 25. VE4BJ   | 64. WA6WGL |
| 26. W0PHM/4 | 65. FG7XT  |
| 27. IIRIF   | 66. W6LDF  |
| 28. DL6EQ   | 67. K5OLU  |
| 29. W0FQW   | 68. W8CQ   |
| 30. W6UGA   | 69. KW6DS  |
| 31. W9HJV   | 70. K8MZS  |
| 32. W5CME   | 71. G2HIO  |
| 33. K8DKC   | 72. PY2SO  |
| 34. W3DJZ   | 73. PY2SO  |
| 35. WB2CVN  | 74. K7MNZ  |
| 36. W6JOX   | 75. I1ROL  |
| 37. VK4RQ   | 76. I1ORS  |
| 38. DL1VR   | 77. OZ8US  |
| 39. DL3IR   | 78. I1KG   |
| 40. W55H    | 79. K8YEK  |

FOR SALE: Frequency Shift Exciter 0-39C/TRA-7 with manual and connectors, \$35.00 local deal only. John Riley, 914 North Cordova Street, Burbank, California 91505. Wanted: Wrecked BPRE 8 level perf or punch block for sale.

WANTED: Used commercial converter. K7YNY, P.O. Box 201, Stanford, Montana 59479.

FOR SALE: AN/FGC-1, TU, AN/FRR-3 Diversity Receiver, Johnson Viking Desk KW, Central Electronics 100V, Model 14 TD, Model 14 typing reper, all in excellent condition with manuals. Sorry, no delivery. W6YNS, 10462 Orange Park Blvd., Orange, California. Phone 714-633-1037.

FOR SALE: Model 28 KSR printer with factory paper winder. Model 28 KSR console cabinet, good shape, complete. Model 28 typing unit parts, state your needs. All machines like new and ready to go. K6PZT, 9337 Gotham Street, Downey, California. Phone 213-869-3292.

NEEDED: Vol. 1 complete, Vol 2 Feb, Mar, July. Vol. 3 July, Sept, Oct, Nov, and December. Vol. 4 complete. Vol. 5 Jan, Feb, Mar, April, June, October. Vol. 6 Jan. Vol. 7 June, October. Vol. 8 May. Vol 10 August. Vol. 11 Nov. Vol. 12 January. Gordon White, 5716 North King's Highway Alexandria, Virginia 22303.



## HORSE TRADES

FOR SALE: 2125 and 2975 CPS dual tuning fork assembly, \$33.00, .05% stability, 68 to 86°F. Transistor fork drive circuit kit, \$10.00; assembled circuit, \$16.00. Data available RIVERBANK LABORATORIES, Box 65, Geneva, Ill. 60134.

FOR SALE: Teletypes (used-rebuilt) and repair parts. Send SASE for list. W6VPC, 1067 Mandana Blvd., Oakland, California 94610.

FOR SALE: 400 cycle precision electronic tuning fork, two tubes (6AU6), you furnish tubes and filament/B-plus, guaranteed; modify to 425 cps for 850, 2125, 2975 reference standards, with schematic, postpaid in 50 states, \$4.00; 88 mhz toroids, 5 for \$2.00; magnetic AFSK TEST TAPE, each \$2.00; model 14, 15 sync motors, \$5.00; model 28 sync motors, \$10.00; Kleinschmidt sync or governed motors \$10.00. All motors freight collect, K5BQA, 11040 Creekmere, Dallas, Texas 75218.

SERVICE: Cleaning and repair of teletype machines. Have in stock every part for Model 14, 15, 19s and many parts for 12, 26, 28, 32, 33, 35s, can contain any parts needed. Manuals for 14, 15, 28s and many oddballs. Teletype machines all models in any style and all special features. Must Sell: 11/16" reper tape, 10 rolls to box, \$2.00. 40 rolls to case, \$7.00. Will buy or trade for Teletype parts and machines. Call or write: Martin Geisler, 213-892-0685, 8926 Kester Avenue, Van Nuys, California 91402.

WANTED: Audio filter #S-7193 Burnell & Co. for CV-62/U. H. E. Stoddard, W6-LGC, 131 Sickles Ave., San Francisco, Calif. 94112.

WANTED: A 2.1 or 1.5 Mechanical filter for 75A4. Have new 800 cps. Swap or sell. VE3GK, 85 Fifeshire Road, Willowdale, Ontario.

NOTICE — RENEWAL SHOULD BE MADE TO EXPIRE ON DECEMBER 1966 ONLY.

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