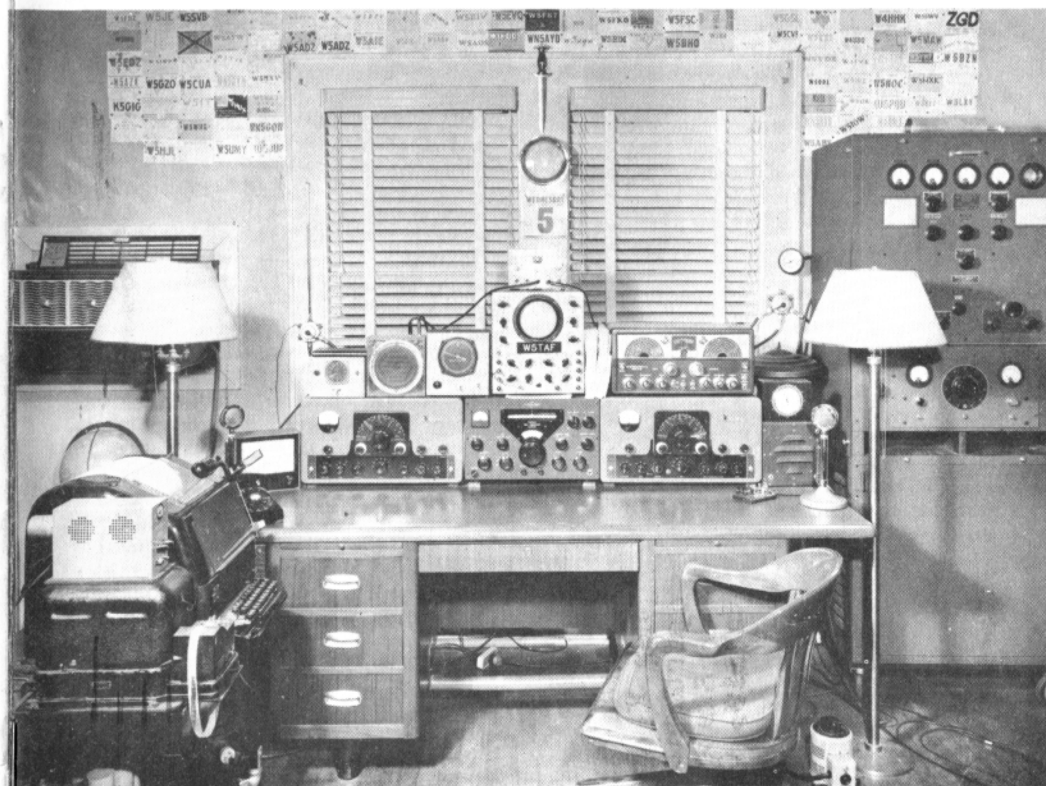
RTTY



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NEWS OF AMATEUR RTTY

DECEMBER, 1957
25 Cents
Vol. 5, No. 12

HORSE TRADES

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

FOR SALE: 14-15 type sync motors—15.00 each.............W9GRW
TRADE: Model 28 complete for 51-J-4 ....W9GRW
WANTED: 1.2 or 2.1 kc Filter for collins 75-A-2. Trade 3.1 kc.........W4SON/5 Box 223, Berwick, La.
WANTED: Model 26 or 15, also tape gear and TU.........W5HAJ
WANTED: Model 26......W1GWU/1, Box 254, Marshfield, Mass.
FOR: SALE: 11/16" tape for 14 perf or reperf.—80c per role. 60c roll in lots of ten. Colored tape buff, yellow, green or red—10c extra W6PGP
FOR SALE: Miscellaneous Teletype parts W6EV
FOR SALE: Three model 14 typing reperfs, and 8 model 14 perfs W6EV
TRADE: O-5-FR for tape gear W7IWH
FOR SALE: Model 19 keyboard, 14 TD, 14 TR, 14 perf (non typing) Sync MXD W9GRW
FOR SALE: 3BP1 with socket K6PNW
TRADE OR SELL: 128-A Sub Sets (has 2-215 and 1-255 polar) ....WOATM
FOR SALE: TU and VFO (FSK'd) see RTTY Nov. 57..K6PNW
FOR SALE: Toroids for Terminal units.............W5TVG
FOR SALE: Toroids (88 mhys) 1.00 each.............W6CQK

RTTY, Inc.
372 WEST WARREN WAY
Arcadia, California
Return Postage Guaranteed

A Double Bandpass Filter

By D. L. (Mac) McMullen—*WOATM*

Many of the RTTYers who operate FSK on the "DC" bands object to the adjacent interference caused by heterodying of CW stations near their operating frequency. It could be possible that more complete QSOing would be possible if a bandpass filter was used. In this way, a station that is causing mis-printing would have to be very nearly on the operating frequency. Yet the Mark and Space frequencies would pass with only a very small loss and it would be built back up at the limiter stage. Some of the fellows already have installed bandpass filters, so they are excused from this portion of the bulletin and can continue with the other articles, that I am sure will prove much more interesting.

This article is written for those who either need a filter, or are thinking about adding one to the present TU. Since I am in no sense of the word an Electronical Engineer, I called WOMMN, Fred Berry who has written several articles about filters for the SSB boys. I sincerely thank him for the data and help that was given by him. He suggested the Constant "K" double bandpass filter.

I got out the "ole" slide rule and started the calculations. Since it had been quite some time, I found the answers were still there if you know where to find them. I have proof of the answers because I also figured them out the "easy" way with the aid of several sheets of scratch paper. After I had figured the proper coil and condenser values, I made another phone call to verify my great mathematics. Fred told me I was all ok. I imagine he had figured them long before I came up with the final answers. For those of you who would like to figure them yourselves, the formulas are provided as well as being shown in photo #1 which also shows the complete filter values.

$$C_1 \& C_5 = 2 \times \frac{F_U - F_L}{4\pi F_U F_L R}$$

$$C_2 \& C_4 = \frac{1}{\pi (F_U - F_L) R}$$

$$C_3 = \frac{F_U - F_L}{4\pi F_U F_L R}$$

$$L_1 \& L_5 = \frac{R \div 2}{\pi (F_U - F_L)}$$

$$L_2 \& L_4 = \frac{(F_U - F_L) R}{4\pi F_U F_L}$$

$$L_3 = \frac{R}{\pi F_U - F_L}$$

The resistance was figured at 500 ohms. This was done for two reasons; one, the receiver output here is 500 ohms and secondly, toroids operate better at low impedance. Since there is very little voltage developed across the coils, low voltage breakdown condensers were used.

All coils were series tuned to the geometrical frequency which is obtained by taking the square root of the products of FL and FU. For those of you that have as much trouble with square root as myself, take my word—it figures out to be 2430 cycles. Photo #2 shows the coils and condensers ready to be tuned. For those of you who have never "fooled" with coils, series the coil and condenser. Hook up a variable audio oscillator and connect to the open ends of the coil, condenser combination. Connect a VTVM to the same terminals and locate the frequency which gives minimum dip. You should not be too far off the 2430 cycle frequency.

If the dip is low, take turns off coil one at a time until the desired frequency is reached. If the dip is high, about all you can do is add capacity or turns to the coil, within reason of course. I might add a tip to help out, use the 50 ohm unbalanced output of the audio oscillator. The dips are more pronounced and does not affect the final results.

After all coils are tuned, you are on your own to assemble them. We used a three and one half inch steel bolt. Insulators were placed inside the coils and between each layer. This reduces the possibility of the bolt having too much effect on the coils. Photo #3 shows the assembled filter. The condensers were arranged so the whole filter would fit into a plug in type IF can. We felt this could be of a great advantage as it can be removed easily for tests or for demonstrations. Photo #4 shows the complete filter after being placed in the IF can.

You are now ready to make the fre quency run on the filter. If available, connect the 600 ohm balanced output of the audio oscillator to the input terminals of the filter. Connect a 60 Ohm carbon resistor across the output terminals along with a VTVM or a DB Meter. Set the oscillator to "O" DB output and read the loss of the filter. You should find there is an insertion loss of about 1 DB and you should obtain a frequency response of about the same as in Photo #5.

Photo #6 shows the relative size of the assembled coils, compared to a "Flip Top Box."

The coils were purchased here locally. The cost was about $3.00 per coil. I asked the manufacturer if more coils could be obtained if desired. I was told that it would be possible, providing enough of the coils were ordered to substantiate the setting up of the equipment, as 100 could be wound just as easily as one, after the initial set up. We are not trying to sell any of the coils; however M.A.R.T.S., Inc. will accept orders for the coils if enough of the fellows would like to obtain them.

If you would like to know how the filter works, build one and try it.

If the photo's are not too good, please forgive me—I'm just an Amateur!

Best of RTTYing to all.

"MAC" WOATM.

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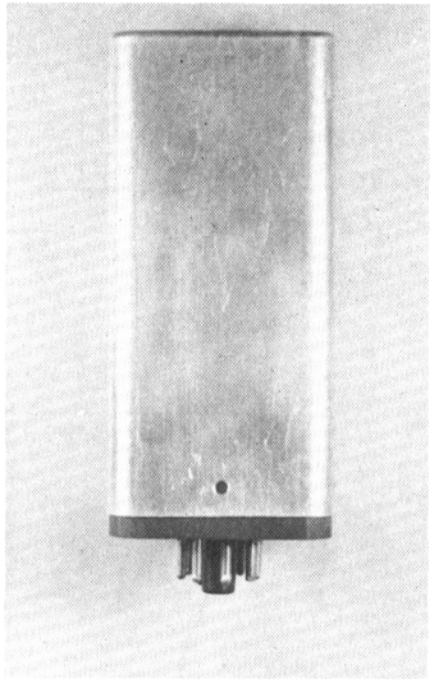

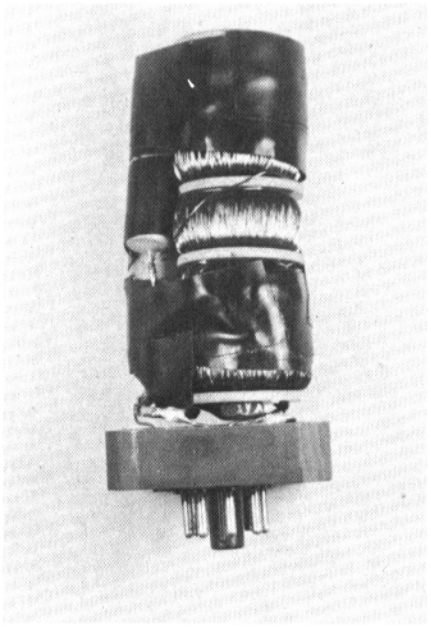

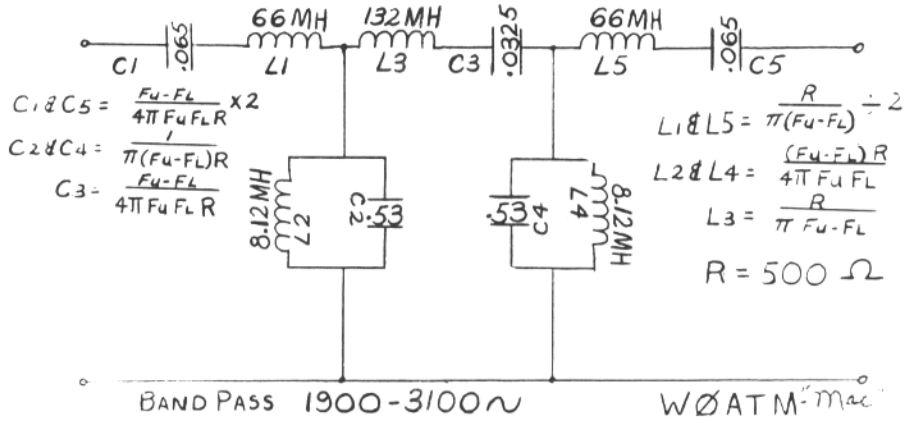

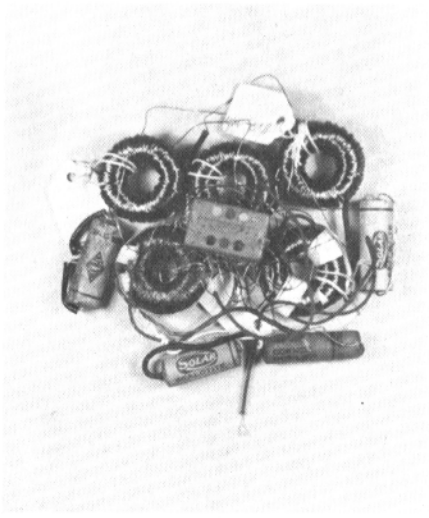

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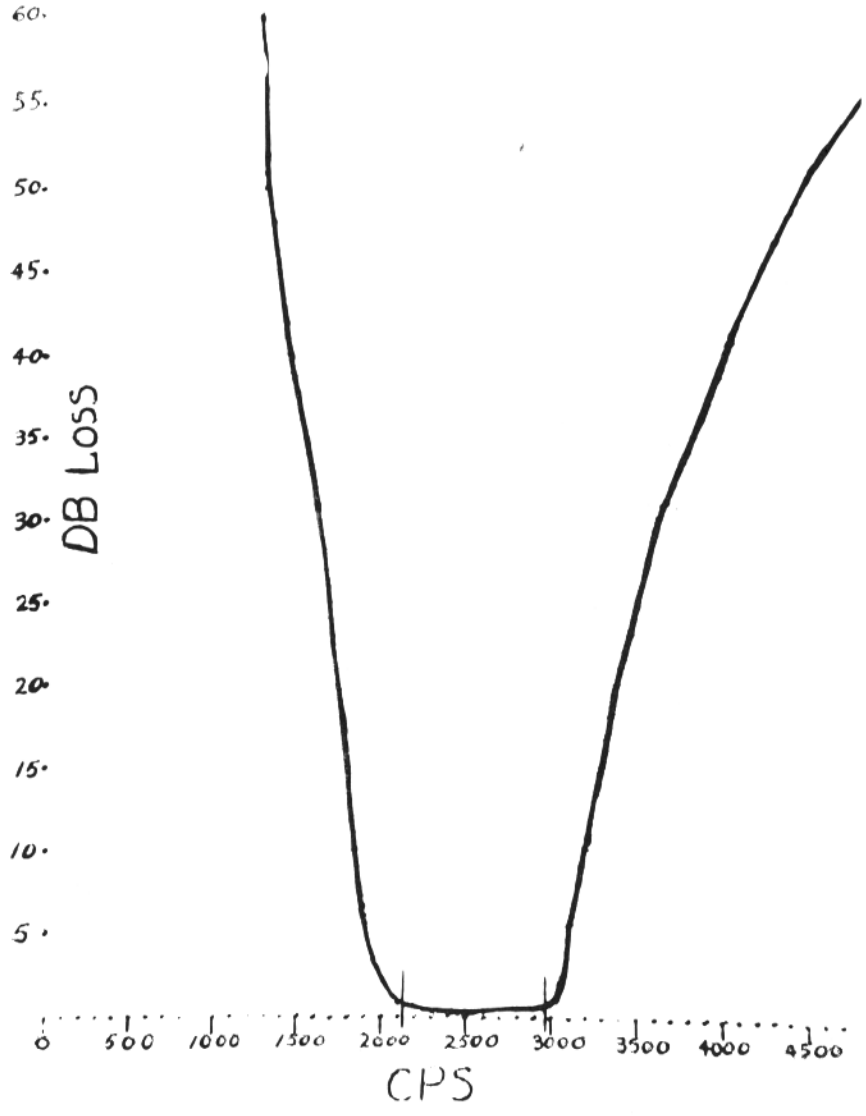
W6CLW—Ed Simmons
W6AEE—Merrill Swan
W6SCQ—Lewis Rogerson

For Traffic Net Information:
W6FLW W6IZJ

For "RTTY" Information:
W6CL W6DEO W6AEE



Modification of the I-97-A Bias Meter

What's YOUR Bias?

By John Pitts W6CQK
P. O. Box 815, Redwood City, Calif.

The I-97A Bias Meter can be a very useful piece of test equipment to those of us who are using polar relays in our terminal units or local loops.

A connecting circuit is shown in Fig 3 for use with TU's having vacuum tube outputs. Several methods of use will be described later.

THEORY

The Bias Meter is essentially a Wheatstone Bridge unbalanced in such a way as to cause the meter to indicate an average reading of ZERO when contacts having exactly 50% break, (or zero bias) are connected in one arm of the bridge.

A study of the accompanying circuit diagram will show that the pulsating contacts form part of the unknown arm of the bridge, and the value of this unknown is indicated directly on the meter as bias. The choke and condenser are added to give damping to the meter, thus causing a steadier average indication.

MODIFICATION

Disassemble the top and sides of the case by removing all the 6-32 machine screws visible from the outside. The original wiring diagram is in the lid of the box, and should be studied, and compared with the modified diagram, Fig 1, to determine exactly what is to be modified. The color coding of the wires is given on the original schematic, and makes the job much easier.

Remove and discard the relay socket, cutting the wires close to the socket. Some of them will be needed. Remove the six-prong socket in the side of the chassis, cutting these wires close to the socket. Also and discard hte patch card but do not remove the rubber cord.

The 10,000 ohm potentiometer mounts in the top panel next to the meter, in a ⅜" hole drilled approximately ¾" in from the top and ¾" in from the right side of the top panel. Cut the shaft to about ½" in length and add a small knob. The space behind the panel was vacated by removal of the six-prong socket. Remove the meter from the panel during drilling and wiring. and the job will be much easier.

The 400 ohm potentiometer behind the panel is removed and discarded, and the 5000 ohm potentiometer is installed and wired in its place. Before installing, cut the shaft of the 5000 ohm unit short enough to fit inside when the case is replaced. If desired, a hole, properly located, may be drilled in the case to allow adjustment of this control from the outside. For this purpose, slot the shaft of the potentiometer.

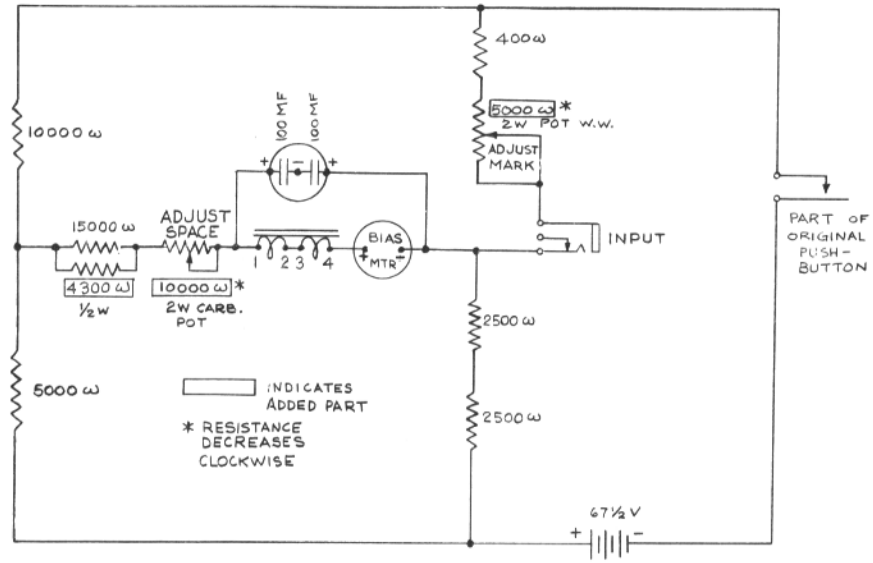
The 4300 ohm ½ watt carbon resistor is mounted by its leads on the terminals of the 15,000 ohm spool-type resistor. The purpose of this resistor is to give the proper range to the meter with a 67½ volt battery, and allow compensation, with the 10,000 ohm potentiometer, as the battery voltage drops.

Only one pair of make contacts on the push-button switch is used for the battery circuit. Remove all other wires. Select the contacts to be used and clean them with a contact burnisher or fine file. A toggle switch could be substituted, but there is always the possibility of forgetting to turn the battery off after use. The unit draws about 8 ma. spacing and 15 ma. marking.

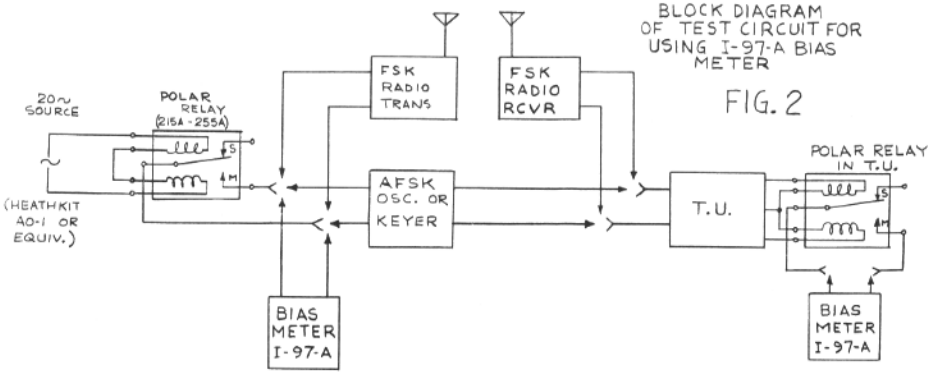
Complete the wiring modification of the meter and carefully check the wiring.

To complete the job, clamp the rubber power cord as it was originally, if the clamp was removed during the modification. Measure eight inches from the clamp, and cut the cord. Skin the outer rubber covering back about six inches, and separate the two wires.

Set both potentiometers to their counterclockwise (maximum resistance) position. Temporarily connect the power wires to



MODIFICATION OF I-97-A BIAS METER FIG. 1



the terminals of the battery. With the jack open-circuited, the meter should read toward the left—SPACE. With the jack circuit closed, the meter should read to the right—MARK. After determining the proper polarity for the battery, solder a pair of battery snap connectors permanently to the wires and install the battery in the side compartment. Insulate the terminals from the metal case with a cardboard spacer.

OPERATION AND USE

With the loop jack open and the battery switch depressed, set the ADJUST SPACE control to cause the meter to read exactly 100 to the left, or spacing. With the loop jack closed by a shorting plug or the contacts of the relay under test, set the ADJUST MARK control to cause the meter to read exactly 100 to the right, or marking. The ADJUST SPACE calibration should be made whenever the meter is used. The ADJUST MARK should hold for long periods unless there is a change in loop resistance.

Refer now to the block diagram, Fig. 2. (1) Connect a 20 cycle source to a polar relay, temporariyl connect the Bias Meter to the relay contacts and read the bias. If the reading is within plus or minus five per cent, make a note of the amount. If it exceeds this amount adjust the relay. See Byron's column in CQ for October, 1956 on polar relay adjustment.

(2) Remove the bias meter, and connect the relay contacts to either an AFSK oscillator or the FSK terminals of the transmitter. Connect the output of the AFSK oscillator or the station receiver to the terminal unit, and the output of the TU relay contacts to the Bias Meter. (CAUTION—Be sure there is no external loop voltage on the relay contacts. Connect to the relay contacts directly).

With the 20 cycle frequency shift signal going through the system, read the bias as measured at the receive relay. Correct this reading by the amount observed in step (1). This is a measure of the internal bias of the system. If the internal bias is greater than five per cent, corrective steps should be taken.

The first step would be to connect the receive relay to the 20 cycle source and measure its bias. With that known, other sources should be investigated. An overall check with a tape or keyboard sending RY's at the full 60 speed should show less than five per cent bias from the TD or keyboard.

The foregoing is a very quick and convenient method of checking the internal system bias, and if 20 cycle dots or reversals are available at a distant station, bias checks from this source can also be made. One very interesting effect that has been noted is that receiver tuning directly affects signal bias.

As of August, 1957, there are at least 400 of these 1-97-A Bias Meters available from G and G Radio Supply Company, 51 Vesey Street, New York City. The price is $7.95 each, brand new in original packing. Postage is extra.

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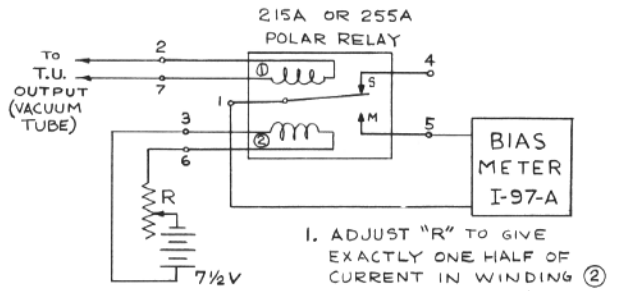

FIG. 3
CONNECTING CIRCUIT FOR USE WITH T.U.'S HAVING VACUUM TUBE OUTPUT

1. ADJUST "R" TO GIVE EXACTLY ONE HALF OF CURRENT IN WINDING ② THAT IS READ IN WINDING ①
2. REVERSE T.U. OUTPUT CONNECTIONS IF REQ'D. TO OPERATE RELAY ON PULSES FROM T.U.

"It has come to my attention that I left out a capacitor in the schematic of my transistorized AFSK generator on page 5 of the September 1957 RTTY. It should be connected from the left hand side of the 10K resistor (connected to the base of the 2N107) Frequency Shifter, to ground. This is from the "high side" of the keyboard contact to ground . . . W2PEE

After delivering a cheap 26 and many chiding letters to JOHN, W5MYI I finally worked New Mexico tonight, Had scheduled him. DO YOU KNOW OF ANY RTTY HAMS IN DELAWARE for my first W.A.S. RTTY? . . . WOBP

Let's set the 15 meter calling frequency at 21,090, following same pattern as on other bands, just under the NOVICE frequency. W6KUY/M M got approval for RTTY on next trip Dec., 15th to Yokohoma. CAS, KR6AK very active every night from Asia, and letter from JACK, VR2AC on FIJI Island is about all set. W3BNX/VE8 and W3UAK/VE8 very close to the NORTH POLE answer 14,345 on SSB due to Canadian regs, but are looking for contacts on 14,140 on RTTY . . . WOBP

Tonight is the NCARTS annual meeting here in Oakland, which the XYL and I are attending. Understand they are going to award a Model 15 Typing Unit. Whatever that is, maybe some one will put it on six or two where I can work him . . . Russell, K6ZBL

Am writing to let you know of a way that I am using to oil my Teletype machine. I have picked up several HYPODERMIC needles from the local hospital and from some veterinerian friends. With the needles you can reach into the center of the felts and do a nice job of lubricating. This saves and controls the oil. I have found the Vets., needles best as they are made of glass and the plunger moves smoothly . . . Hary W7RZY

CORRECTION: The person first in the photo (see caption) on page 11 of the August 1957 RTTY is W9IHO, Bill . . .

Please discontinue my Horse Trades since I have traded the item. The response of the ad was tremendous. I have received fifteen inquiries from everywhere. Thanks for running it . . . William, W4-BUZ

After several long conferences with the RADIO BRANCH which controls Ham Radio in Australia, at last I have been granted a license to use RTTY in the frequency range 14.0-14.1 mc/s This is the first RTTY permit issued in Australia—which is "sumpin." Cliff VK4CG

Of particular interest to all radioteletypers is the program for April 6, 1958 at 2 P. M., E.S.T. when Mr. Sal Barone, President of the Northern Radio Corporation, will speak on Radioteletype. Talk to be given from AF2IYX on 15,715 MCS. AF2-IYX has an excellent transmitter and has good coverage . . . John W2ANB

Let's have some dope on FSK for the Central Electronics 20-A Exciter . . . John W8LSQ

I hadn't been active for some years when I got the RTTY bug a little more than a year ago. Believe I have accomplished quite a bit in that time. Constructed a TU combination RTTY and Modulation Monitor, using a 5CP1. Completed two crystal controlled conveters for 20 and 10, raised two fifty foot poles for antenna, and have finished a DX-100 which I intend to convert for FSK per article in RTTY some months ago . . . Steve . . . VE7CF

With 1957 drawing to a close we can look back and see many strides in Ham RTTY operation over the nation and DX wise, but the West Coast leads them all in the accomplishments during 1957.

Southern California is outstanding in their two meter net operation utilizing auto-start and average over one hundred check-ins per month. They have secured several Fax machines and are operating weekly in the xchang of schematics and other information that can only be handled by "Fax."

RESULTS OF THE 1957 RTTY SWEEPSTAKES CONTEST

Another SS contest is history, and total scores are higher than in any past RTTY SS contest. Band conditions were much better than other years. High score was made by WOBP with 5500 points. Beep wrote that he had it figured out this year, and his score looks like he might have had the correct information. Skipper, W2RUI, was second wtih 5440 points. He took first place in the fourth SS contest last February. Next were W2TKO with 4680, followed closely by Frank, W3PYW with 4672 points. In all 37 different ARRL sections were active on RTTY during the contest period. One of the high lights was, W8NIY being heard by KR6AK for a bit of DX. Some 87 stations took part in the contest. Following are the scores by Call Area.

Call	Total	Points	Sections	Location
W1ASZ	2700	108	25	New Hampshire
W1AW	616	44	14	Connecticut
W1BDI	782	46	17	Connecticut
W1BGW	1850	74	25	E. Massachusetts
W1FGL	312	26	12	E. Massachusetts
W1RBF	440	40	11	Connecticut
W1ZXA	507	39	13	Rhode Island
K2HHH	352	32	11	Northern N. J.
W2KXT	108	18	6	Western N. Y.
W2RTW	1892	86	22	Western N. Y.
W2RUI	5440	160	34	Western N. Y.
W2TKO	4680	156	30	Western N. Y.
W3NQC	8	4	2	Maryland
W3PYW	4672	146	32	Wash./Del./DC
W4AIY	18	6	3	Georgia
W5YM	1680	80	21	Arkansas
W6AEE	1850	74	25	Los Angeles
W6CG	308	28	11	Los Angeles
K6CHR	160	20	8	Los Angeles
K6EJM	102	17	6	Santa Clara
W6LFF (XYL)	12	6	2	San Francisco
W6MSG	473	43	11	Santa Barbara
W6MTJ	2484	92	27	San Francisco
K6OUR	341	31	11	San Francisco
K6OWQ (XYL)	96	16	6	Los Angeles
W6ZVO	32	8	4	Los Angeles
W7IWH	374	22	17	Utah
W7CSC	168	24	7	Oregon
W8NIY	765	45	17	West Virginia
K9BRL	660	44	15	Indiana
W9GRW	374	34	11	Illinois
W9LDH	408	24	17	Wisconsin
W9TCJ	3420	114	30	Wisconsin
W0BON	98	14	7	Colorado
W0BP	5550	150	37	Minnesota
W0DW	264	24	11	Nebraska
W0FQW	600	40	15	Iowa
W0JHS	60	12	5	Minnesota
W0KXB	338	26	14	Kansas
VE7KX	1054	62	17	British Columbia
ZL1WB/O (Reev only)	132	12	11	At WOBP's Minn.

Stations taking part by call areas (some of these did not submit logs in time to be listed above):

WIs, ASZ AW BDI BGW EFF FGL OUG RBF ZXA, W2s, GWL JAV KXT PAU PBG RTW RUI TKO UBL, K2s, CSC CQ KDW USA, W3s CRO FU OGD NQC PYW, W4s, AIY EHU, K4WMA, W5s, BOT GIY JBW TBK YM, W6s, AAN AEE CBF CG HIF IZJ LFF MSG MTJ PGP PZV ZBV ZVO, K6s, CHR EJM OUR OWQ W7s, CSC IWH MAH MUQ PSO YHS, W8s, CRY DOOLEX LN NIY UEV, W9s, DJE DPY FXV/9 GRW LDH SPT TCJ UE, K9BRL, WOBON BP DW FQW FUU IZD JHS JRQ KXB LFI YMB, VE2ATC, VE7AIK VE7KX, ZL1WB/O . . .

FIFTH ANNIVERSARY RTTY SWEEPSTAKES CONTEST

Starting at 6:00 P.M. E.S.T., Feb. 14, 1958 running for 33 hrs. (to 3:00 A. M. E.S.T., Feb. 16). See page 86, Feb. QST for details. Any bands may be used. Count one point for each msg sent and acknowledged by RTTY. Score one point for each msg received by RTTY and acknowledged by RTTY. Msg to consist of msg nr., originating stations call, ck or RST, ARRL Section, time, date and band. Multiply points by number of different ARRL sections worked. Note, count each section only once regardless of number of bands worked. Mail logs to RTTY INC., 372 West Warren Way, Arcadia, California.

There will be an informal short shift (170cps) RTTY Contest held March 15 and 16. See page 86 Feb., 1958 QST for details.

Thru RTTY assisted by NCARTS, the Pac. Tel. and Tel. Co. have completed replacement of over 700 Model 26's on the West Coast, all of which have been placed in amateur hands.

Thru the "spark-plugging" of Bob, K6-KFF, six meters now has 14 hams active in that band. Weekly ARRL and NCARTS bulletins are broadcast by K6KFF on six meters, K6OUR, W6ASJ, W6VPC on 80, 40 and 20 meters as well as two meters, K6GZ has inaugurated the "quick brown fox" traffic net which he NC's Monday thru Friday from 630PM to 700PM on 3620KC.

Sixth Army MARS YTTY activity undoubtedly leads the entire nation, thanks to Major Francis D. Ivey, MARS director, an ardent CW and RTTY ham. With A6-USA starting off the week with the broadcast of MARS bulletins on RTTY at 10PM PST each Monday on 3347KC, MARS RTTY activity starts; A6ASJ/B two metre RTTY net from 730PM to 900PM each Tuesday. A6MSG/A RTTY net on 3245-KC each Wednesday at 900PM PST. A6-FLW/A two meter net at 800PM each Wednesday, A7NVO/A two meter, A-Q A-E and RTTY net at 700PM each Monday, in addition to the newly inaugurated RTTY nets from A6USA on Saturday and Sunday on 6997.5KC.

Sixth Army MARS has secured and is now checking out the two meter repeater station at A6USA which will be permanently installed on top of Mount Vaca which will give coverage on two meters to the Sacramento, Salinas and San Joaquin valleys with the possibility of another repeater station later, to the south, which will give complete two meter coverage to the State of California.

Congratulations, one and all, and the best of wishes for the coming Yule Season and New Year. —BUCK, W6VPC.

The following are now on RTTY in Trenton, N. J., W2TAM, W2UAE, K2-CLD, K2TQI . . .

W2TAM has an excellent article in the current issue of D.V.R.A. NEWS (Delaware Valley Radio Association).

Liked the Post Card announcement on the November SS contest . . . Roy, W2TKO

During the contest I heard KG1AC calling but don't think anyone worked him, I tried but with no luck . . . Roy, W2TKO