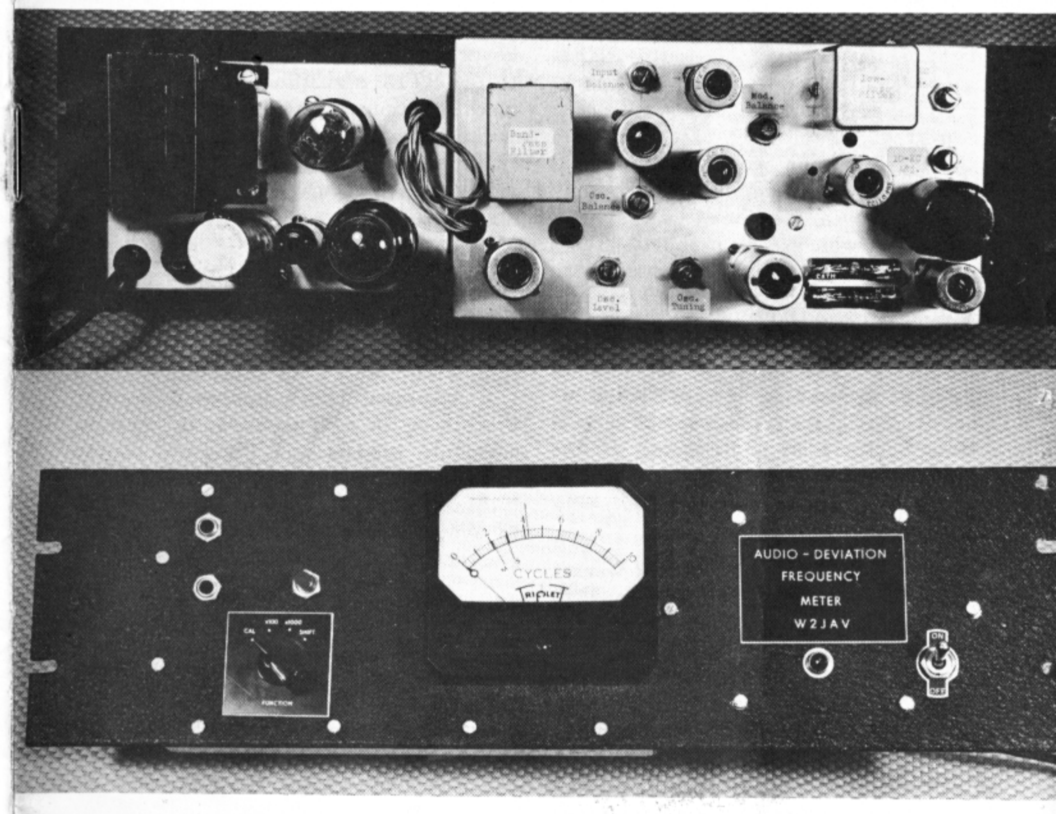
HORSE TRADES

This page of the Bulletin is for use of amateurs who who have RTTY equipment for sale or trade and those looking for equipment to buy or trade. It is afree service and may be the means of getting someone on the air.

- FOR SALE—Model 12 with Terminal Unit(Torroids), All Electronic Keyer, Padded Cover, Box of Paper W6IES
- FOR SALE—1 Complete Model 12 Brush Motor 2 Spare Keyboards for 12 .... W7FNA
- FOR SALE—1 Receiving Distributor for 12, 1 Model 25 Printer, 8 to 12 Toriodial Coils W2EHW
- FOR SALE OR TRADE—Kleinschmidt (CW) Perforator, Transmitter Head and Power Supply W7WJ
- WANTED—Station Photos or group plates for use in Bulletin .... RTTY
- WANTED—Keyboard for Model 19 .... W6AEE
- FOR SALE—Model 12 Complete with Keyboard .... RTTY
- FOR SALE—Model 15 Complete W6AEE
- WANTED—Base for Model 15 .... W2JAV
- WANTED—Tape Off the Floor Copy .... RTTY

RTTY SOCIETY OF SOUTHERN CALIFORNIA
3769 East Green Street
Pasadena 10, Calif.
Return Postage Guaranteed

RTTY



RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRY

NEWS OF AMATEUR RTTY

FEBRUARY 1954
25 Cents
Vol. 2, No. 2

W6OWP RTTY *Receiving Converter*

By F. A. BARTLETT, W6OWP

Necessary accessory to any RTTY used for radio work is the receiving converter, or T. U. as it is commonly called. Here's data on the one used at W6OWP. Inherent characteristics make it a versatile unit for ham band or general RTTY intercept. It is not critical of shift range; nor is the input band width highly important. The marking signal may be suppressed completely, as is the case with space- function make-and-break or when sharp crystal filter selectivity is applied. The only odd-ball item in the circuit is the FL-8 audio filter, which is no problem. They, or their equally satisfactory cousin, the FL-5, are plentiful in surplus for less than $2.00.

This description is not presented as "the ultimate" by any means. But certain certain features are interesting if for no other reason than "the approach is different."

Briefly, here's how the gadget works: the receiver is tuned to supply a 1020 CPS spacing signal, with the mark frequency higher by whatever amount the incoming signal is shifting. (Refer to Fig. 1). If the signal is make-and-break, it is tuned to 1020 CPS on whichever side of zero beat receiving conditions are best. In the first two converter stages, the signal is amplitude limited and fed through the 1020 CPS FL-8 filter. The net effect is to establish an amplitude differential between the spacing signals and marking or noise impulses.

When the received signal is FSK, the "capture" effect of the limiter holds down noise on marking pulses. But even on make-and-break, or when high selectivity attenuates the mark signal, a substantial amplitude margin is developed.

A biased diode "detects" this differential, passing only that portion of the input above the threshold or noise and/or mark signals. Two stages of amplification build up this resultant spacing signal before feeding it to a rectifier. The developed D. C. is used to block a keyer tube supplying marking current to the RTTY signalling loop. Since this blocking occurs only on spacing impulses we have what amounts to an electronically keyed neutral loop—with the keying originating at the distant transmitting station.

Fig. 2 shows the schematic hookup. Tube function may be identified by reference to the block diagram.

A saturated triode limiter is used in preference to a dual triode to decrease harmonic production. Omission of the cathode resistor and condenser in the "A" section of the 6SL7 is intentional to avoid reactive effect of plate voltage fluctuation with keying of the 6L6.

Circuit values shown for the 6L6 plate and screen circuits are typical for a Model 15 printer using a WE-255A relay. Adjustment for other signalling loops is readily made by changing either the series plate or screen resistors.

Tuning and monitoring is done aurally through headphones connected beyond the amplitude detector. A little practice quickly teaches correct technique for tuning incoming FSK signals.

In duplicating this converter, the detector threshold control R1 should be set initially to give a clear, crisp monitor tone when an FSK signal is tuned as previously noted. Refinement of this setting may be made after the unit is operating a printer.

Resistance of R2 must be determined experimentally since voltage at the rectifier output is subject to constructional variables. It is suggested that a 200,000 ohm potentiometer be connected temporarily and adjusted to just cut off plate current when a steady carrier is tuned to give response in the monitor phones. RTTY signals should now be tuned in and a mean point established on this resistor between limits of error-free printing. Resistance at this setting can now be measured and a fixed resistor substituted.

In some cases, different values of R2 can be used to compensate for mark or space bias in received signals; a lower value of resistance giving best copy for a signal biased to space with the opposite holding true for an excessively heavy marking signal. This isn't shown in Fig. 2 since effectiveness for a given installation would have to be determined experimentally.

The switch SW1 in the signal rectifier circuit permits isolation of the printer for tuning, transmitting or stand-by purposes.

Only likely difficulty in building a converter of this type is instability in the audio stages. Use of a 6H6GT in place of the metal variety is recommended as some undesirable coupling has been traced to the latter.

Since this converter provides neutral printer connection, keyboard and T. D. functions may be wired in series with it. For a simple transmitter keying arrangement, the circuit described in QST for August, 1953, provides full RTTY operation with a minimum of components.

Alternate Output Stage for Developing FSK Keying Voltage

QST for August, 1953, described a reactance tube FSK keying circuit driven from the RTTY signalling loop. An alternate output stage to supply this driving voltage is shown in Figure 3.

The VR-105 stabilizes the voltage existing from the 6L6 cathode to ground whenever continuity through the RTTY loop is interrupted. This occurs during the spacing intervals of either keyboard or T. D. keying where these functions are wired for neutral service.

The RC network made up of the two 7500-ohm resistors and a .1 mfd. condenser works in conjunction with the neon bulb to prevent contact transfer clicks from reaching the reactance tube. In addition, the neon bulb provides isolation of the reactance tube except when keyboard or T. D. is operating.

The values shown were worked out for a Model 15 printer operating on a 30-milliampere marking current. The reactance tube FSK circuit input resistance provides a 10,000-ohm load across the converter terminals 2 and 3.

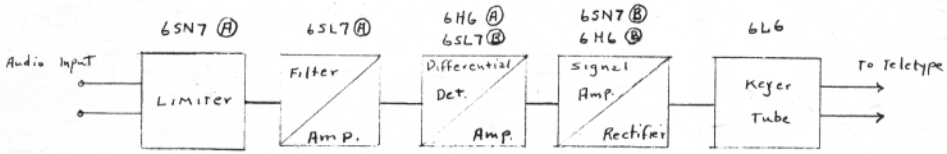


Fig. 1—Block Diagram

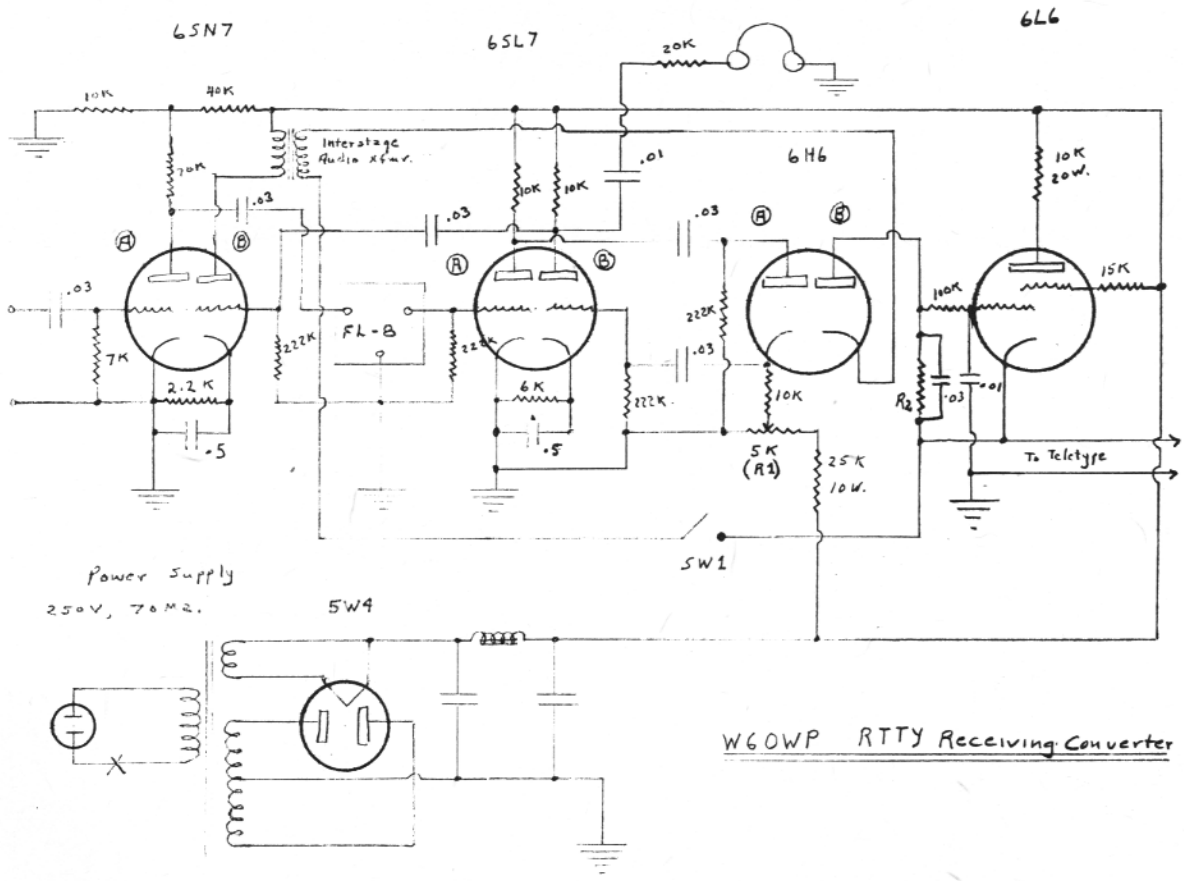


Fig. 2—Schematic Diagram

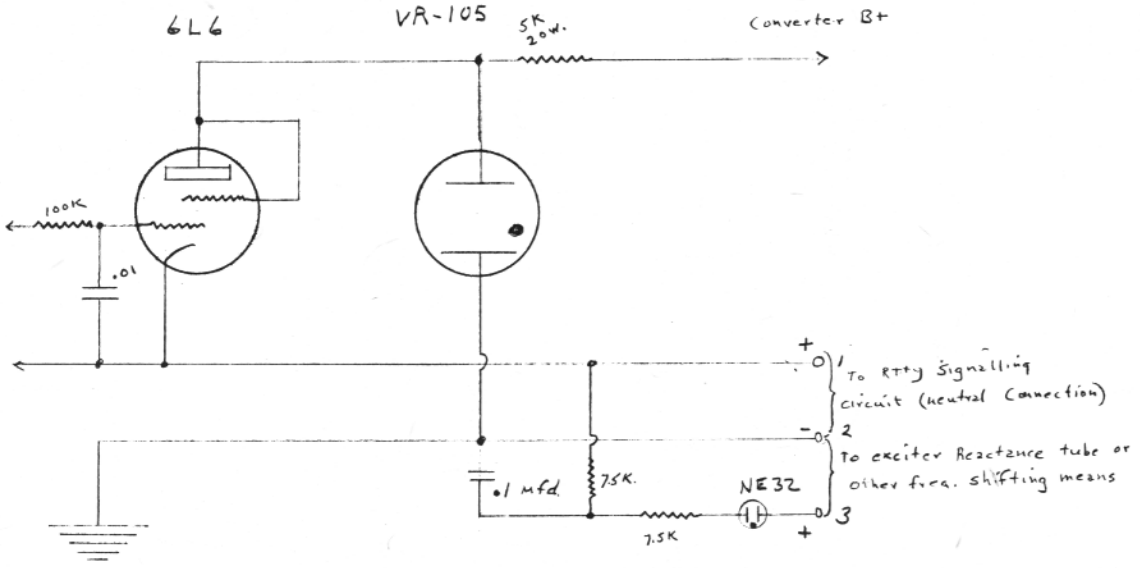
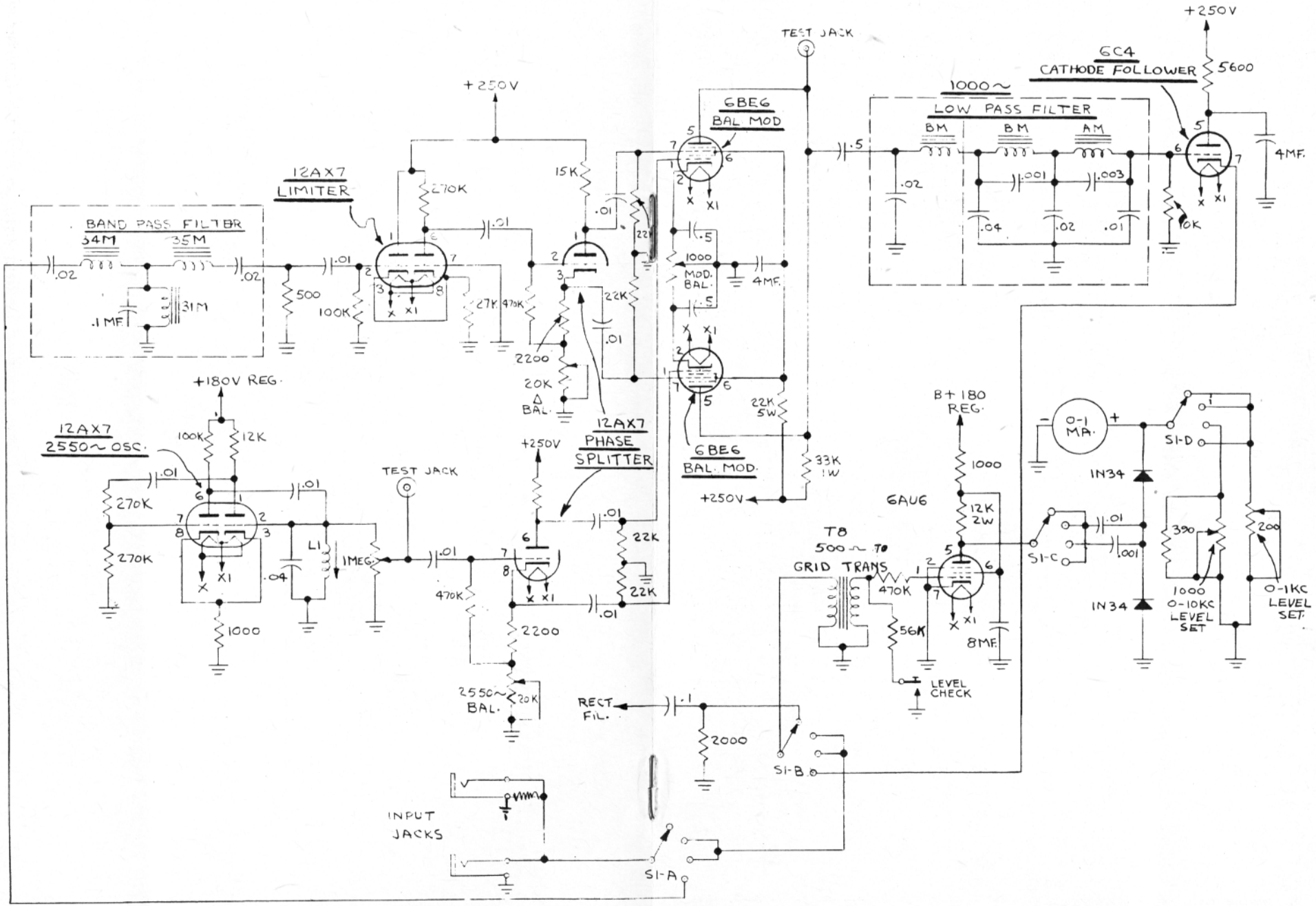


Figure 3—Alternate Output Stage to provide stable, positive keying voltage for FSK Exciter when Keyboard or T. D. is operated


BAND PASS FILTER
.54M
.35M
.02
.02
.1MF
.31M
12AX7
LIMITER
+250V
270K
15K
.01
.01
500
100K
27K
470K
2200
20K
BAL.
22K
.01
6BE6
BAL MOD
.5
1000
MOD. BAL.
4MF.
22K
5W
33K
1W
+250V
TEST JACK
1000~
LOW PASS FILTER
BM
BM
AM
.02
.001
.003
.04
.02
.01
6C4
CATHODE FOLLOWER
5600
4MF.
10K
+180V REG.
12AX7
2550~ OSC.
100K
12K
.01
270K
270K
.01
.04
L1
1MEG.
X1
1000
TEST JACK
.01
470K
+250V
12AX7
PHASE
SPLITTER
2200
2550~
BAL.
20K
.01
22K
22K
.01
6BE6
BAL. MOD.
+250V
B+ 180
REG.
1000
12K
2W
6AU6
T8
500~ TO
GRID TRANS
470K
56K
LEVEL
CHECK
8MF.
0-1
MA.
S1-D
IN34
IN34
S1-C
.01
.001
390
200
1000
0-10KC
LEVEL
SET
0-1KC
LEVEL
SET.
RECT
FIL.
.1
2000
S1-B
INPUT
JACKS
S1-A

Audio-Deviation Frequency Meter

By PHIL CATONA, W2JAV

There is nothing new in this device, it is a simple adaption of existing principles working to create indications adaptable to RTTY. In brief it combines a simple but effective audio freq. meter of two ranges, (0-1 KC, and 0-10 KC) with a limiter, balanced modulators and a local osc. of 2550 cycles. It is self-contained and only requires an audio signal from the receiver's output to activate it. (.5 V-500 OHMS). An input level switch "S-2" is used to establish limiting level, if readings drop appreciably, when the input level switch is depressed, then the input level is too low for reliable reading.

In use it will indicate the correct tuning of a RTTY signal and indicate the freq. shift at the same time. This can be be accomplished with the incoming signal at normal speeds. It also is intended to give the shift. Other uses are apparent, correctly net in on other signals, QSY a specified number of cycles or KC, indicate drift, etc. It is not only confined to FSK, but to AFSK as well, except that a maladjusted AFSK signal cannot be tuned in to indicate a running deviation check. (A mark and space tone must be sent to check it on the 0-10 KC range.)

Primary consideration was given to the availablity of components, as the meter would be of little value to the group if special parts were involved.

All of the reactors in the band pass and the low pass circuits are from FL-8-A filters (one such filter will supply all but one check, the type marked "BM"). The letters and figures appearing on the print indicate the code found on these reactors. The only requirement being to tape the "I" laminations back on all units except the input reactor of the low pass marked "BM". (Just the coil and the core "E" laminations are used). The inductances of the various units in these filters are as follows for those who can procure them. 34M and 35M are .2H., 31M is .042H., The ones marked "AM" are 2.7H., and the "BM" is 3.5H.

The osc. coil is a universal wound RF choke of 100MH, a small TV slug and form are placed in a hole drilled in the wooden form for fine adjustment. The meter is a four inch square panel meter-0-1 Mil. The power supply is not shown as the only requirement is that the 180V tap be well regulated. (VR-105 & VR-75)

The input function switch has four positions, the first is to check the calibration at 120 cycles. This is accomplished by utilizing the 120 cycle ripple at the power supply rectifier filament and feeding it to the 1 KC range. The second position feeds the input direct to the 1 KC range and the third position to the 10 KC range. In the fourth position the input is routed through a band pass filter of approximately 1800 to 3300 cycles. This pass band is fed to a limiter and then to one half of a dual triode as a phase splitter. The local oscillator is used to feed the second half of the phase splitter. These combined and dephased signals (180 degrees) are injected into a pair of balanced modulators. It can be seen that the 2550 cycles is mid point between mark (2125) and space (2975), thus normal signals produce a beat note of 425 cycles for either mark or space. The output of the balanced modulator is such that the fundamental inputs are balanced out, the low pass filter insures further suppression of the fundamentals and other unwanted beats. The resultant signals are now fed to the audio frequency meter limiter and counter for a normal scale reading of 425 cycles on correctly aligned signals. (This range is 0-1 KC on shift position).

To tune in an FSK signal, the switch is placed in the 10 KC range and the incoming signals are tuned to result in audio tones in the mark and space region. The input is then switched to the "shift" position and the receiver is very slowly tuned to indicate a steady needle reading. If the incoming signal is correctly adjusted, the needle will remain stationary at 425 cycles. If not, slowly tune the receiver to get a steady needle reading, the frequency now indicated is one half the shift. (Double the reading for total shift report) if the readings are unsteady, a quick means of checking the proper range is to drop back to the 10 KC range and see that the note is within the mark-space region. Also depress the "input check" button to insure a reliable reading.

I would like to point out at this time that the input band pass filter is not absolutely necessary. It does, however, more than pay its way keeping down unwanted beats. The adjustments are not difficult and only problem should be that of obtaining good standard frequency checks.

To set up the frequency meter portion, all that is needed is a 1 Kc input (over a half a volt or so) and adjust the meter to full scale with the pot. Same goes for the ten KC range. (Suggest you check the meter linearity, by sweeping an audio generator in the proper range). A limiting check should also be made on the audio frequency section by running the input voltage up and down. The meter reading should not vary over a scale division from a half of a volt to over forty volts.

Adjust the local oscillator to 2550 cycles with a known standard, as its accuracy is important. With a vacuum tube voltmeter or scope connected to the detector's output test jack, and a short at the local oscillator test jack, introduce a signal (about 2550 or so) into the input jacks with the function switch in the shift position. Observe the output and tune the balance pot in the cathode circuit for a null. The input balance pot should be set approximately to 80 per cent rotation while balancing the detector's output. Remove the input signal and the short on the oscillator's output. with approximately .2 volt at the test jack, (observe the detector's output) tune the balancing pot for a null.

It would now be well to check both balancing pots at one time, and try to obtain the best possible null with a common setting of the detector balancing pot. The injection level should end up around .2 of a volt or so, optimum setting being a compromise between smooth meter indications when an input signal is slowly swept from mark to space, and enough to give a reasonable mixed output. Too much injection may introduce bumps in the meter readings at low audio ranges. However if the detectors and the input and oscillator balance is good, along with the low pass filter doing its job (over 70 DB at 1800 cycles) no difficulty should be observed.

Circuit Diagram is shown in center of book on pages 6 and 7

Subscription Rate $2.50 per year

RTTY is the Official Publication of the

RTTY Society of Southern California

and is published for the benefit of all RTTY Amateurs and Experimenters.

For Information regarding the Society contact the following:
W6CLW—Ed Simmons
W6AEE—Merrill Swan
W6SCQ—Lewis Rogerson

For Traffic Net Information:
W6FLW W6IZJ

For "RTTY" Information:
W6CL W6CLW
W6DEO W6AEE

Society Meeting

The regular bi-monthly meeting of the RTTY Society of Southern California was held Saturday Night, January 23rd, at the Michillinda Womens Club House in Pasadena. A good attendance was had even though we were having some of California's winter weather (rain). The feature of this meeting was a talk by Mr. Art Addaway of the Pacific Telephone and Telegraph Company. W6 SCQ provided a Model 26 for Mr. Addaway to demonstrate the various features of this machine. Major points which require service from time to time were described and necessary adjustments explained. It was quite evident that his talk was well appreciated by the number of members seen busy with note books.

After a short business meeting, a drawing was held for the door prize, a pair of W6AEE type filters, adjusted and ready for installation, with W6ORV being the fortunate member to win them.

Coffee and sinkers were served by W6BWQ. It was with difficulty that the meeting was adjourned at 11:45 p. m. by figuratively shutting the doors on the members. Approximately eigthy five members were present.

The place for the next meeting has not been selected yet so members will be informed of the meeting place and date by bulletins on the air and by mail.

As the group expands it will be necessary to get a larger hall to accommodate this increasing membership.

Anyone wishing to join the Society can get in touch with any of the members of the committees and information will be gladly given. Also subscriptions to the RTTY Bulletin will be taken by these same committeemen or send direct to Merrill Swan, W6AEE.

Be seein' you at the next meeting!

Traffic Net News

EMILE DUVAL, W6FLW

The RTTY Society of Southern California Net operates every Tuesday evening at 8:00 p. m. on 147.85 mc.

Activity for the Month of January.

January 5—W6FLW, N.C.—17 Checkins

W6AEE	W6PNW
W6CAP	W6RL
W6CL	W6SCQ
W6CMQ	W6UPY
W6DEO	W6WYH
W6DMK	W6ZBV
W6EV	W6KNI
W6IIV	W6FLW
W6IZJ	

January 12—W6IZJ, N.C.—10 checkins.

W6CAP	W6IIV
W6CL	W6KNI
W6CLW	W6SCQ
W6EV	W6ZBV
W6FLW	W6IZJ

January 19—W6KNI, N.C.—12 checkins.

W6AEE	W6KNI
W6CAP	W6RL
W6CLW	W6SCQ
W6DEO	W6WYH
W6EV	W6NAT
W6IZJ	W6KNI

January 26—W6NAT, N.C.—14 checkins.

W6AEE	W6ZBV
W6CL	W6ICS
W6EV	W6CYR
W6FLW	W6IIV
W6IZJ	W6CAP
W6SCQ	W6TRX
W6NWM	W6NAT

. . . . W6NAT de W6NYF, hi Bill, this is the first time I was able to connect up with you—swell . . . .

* * * *

Sure glad to hear another local station on even only two blocks away, W6JJP de W6CL in Gardena GA George.

* * * *

Only using a ground plane inside the shack her Johnny, W6NWM de W6JAU.

* * * *

. . . . W4RKD W4RKD and W2BDI W2 BDI de W1BGW W1BGW, Well I think the CW QRM has left us. If it hasnt it will be off before we get thru. We should not QSY for them. Just keep this up until they learn that this is the RTTY frequency. Think I will be able to copy W4RKD if the QRM stays off. Will turn it over to W4RKD and he can turn it back to you Ed so GA W4 RKD de W1BGW, Boston KKK

* * * *

. . . . W6ILW from W6NAT RTNET, We'll add your name to the checkin list Steve, so W6CAP did you get that for your list de W6NAT RTNET . . . .

* * * *

. . . . W6TRX de W6SCQ Fine and its nice to hear another new station on the two meter band . . . .

. . . . W1BGW de W2JAV . . . Roger and fine all the way Jack. Good evening to you. Yes it has been some time since we worked—Well a lot of things have been happening — sometimes cant keep up with them — have been on quite a bit lately and find that conditions are screwed up — the skip has been in for some time and a lot of commercials have come in on the band — some right in the channel too — almost called one the other night thought he was a ham—Well Jack I did get the 26 and am using it now — and boy its a dream . . . so doggone smooth that I cant hear it run hardly. That is compared to the 12—I frankly think that it is quieter than the fifteen—sure think that you should by all means try to get one—Marv and I and Frank each got one—and the shipping was not too bad only cost me about fourteen dollars the whole way to my door. Just went right off. Boy forty has been a real mess—so before this gets messed up I'll shoot it back to you ole boy . . . .

* * * *

. . . . W6NAT de W6ORV. Fine Bill, How about getting on 420 again some time when we can work straight thru your 420 signals are R9 here . . . . a very nice signal off that old surplus rig so back to you W6NAT de W6ORV.

* * * *

. . . . W6FXF de W6NAT. I had to copy you on the Model 12 Karl, for some reason the 26 was printing greek on your signal and when I changed over to the 12 it was perfect copy . . . .

* * * *

. . . . Hi! Hi! That make-break is rough to copy. I was doing about 90 per cent with him Saturday night feeding space tone in locally Hi! That's a heck of a way to RTTY Hi! I told him to go FSK. No excuse for break-make—FCC gave us FSK! W2JAV de W3PYW, Silver Spring, Md.