RTTY

NEWS OF AMATEUR RTTY

NOVEMBER, 1956
25 Cents
Vol. 4, No. 11

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: Communications key tops for 12, 14, 15, 26 $4.00, tax and postage included W6EV

For Sale: Two Model TG-7Bs complete reasonable....W4UYU

Trade: Model 26 for 14 Perforator.....W4EHU

FOR SALE: RTTY Gear, misc. (Model 15 Bases $50) W2ZKV

WANTED: RTTY Equipment, Model 14 keyboards or receiving bases, tape containers and covers W2ZKV

For Sale or Swap: WU Distributor with AC Sync Motor WU 7B Transmitter with base, Receiving dist for 12, Model 21A printer.....K2OBJ

For Sale: Model FRF Converter (0-1000 cycles) Model FRC Converter (Dual Channel AFSK) Model FRA Converter Model FSD FSK Keyer with power supply WE 255A Polar Relays, Brand new. Model 12 Complete W2AKE

For Sale: Parts and repairs for RTTY gear.....W9GRW

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

PASADENA CALIF. JAN 5 7:30PM 1957

U.S. POSTAGE 3¢ IN GOD WE TRUST LIBERTY

A Simple Mark/Space Audio Oscillator

BY BOYD "BEEP" PHELPS, WØBP, W9BP

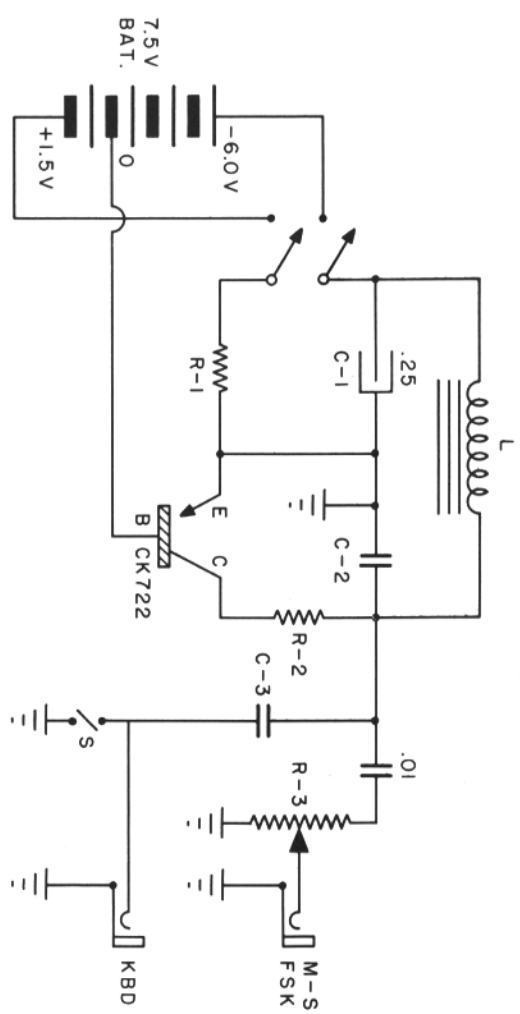
As the title implies, 2125 or 2975 cycles of audio can be obtained from this transistor oscillator powered by a "C" battery. It is a handy RTTY tool useful in testing the mark or space action of terminal units, can be used for AFSK transmission on 1¼, 2, 6, or 11 meters, or can be operated from a tape transmitter-distributor or from the local keyboard to the printer via TU for a large variety of experiements free from the vagarities of radio reception. Used with a scope having linear sweep of about 6.13 cycles, distortion of pulse lengths can be located anywhere along the line from keyboard contacts thru band pass, limiter, selective amplifiers, discriminators, clipper, clamp, polar relay, flip-flop, keyer, printer, or what have you. Without a scope receiver or tape gear, RYRY or just tied down single letters my be run into the unit and the printer range adjustment oriented for the overall mythical 10-90 ideal range as we "tinker." (Or is it research and development, Coupez?)

The cheapest commonest two buck CK722 transistor is used with positive 1.5 volts on the emitter and negative 6 thru the tuned circuit to the collector, the voltages not being critical. One tapped 7½ volt "C" type battery will deliver the few microamperes required for such a long time that a 44 cent off switch is a luxury. The whole oscillator can be put on the narrowest relay rack panel or subminiaturized in a pill box including its own power source. The waveform is excellent.

In reference to the values given in the diagram, R-1 and R-2 may be reduced to obtain more power with some harmonic increase. The inductance may be most anything. If a poor choke is used, R-2 may be 1,000 ohms or less, or it may be over 10,000 ohms with a good toroid. Some research (tinkering) with a temporary rheostat will determine the best resistance to use with the coil at hand, keeping in mind that the weaker the oscillations the more perfect the wave form. C-1 should be relatively large and C-2 adjusted first to produce 2975 cycles without C-3 in the circuit. C-3 is then adjusted to drop the frequency to 2125 cycles with the toggle switch closed or the keyboard plugged in.

The AC output is four volts at maximum volume setting, but as may be expected from an oscillator without buffer, load variations will cause some change in frequency at this setting, altho broad band filters in terminal units may not notice this minor effect. For most accurate use it should be adjusted to a fixed load or used at low volume control settings where only two or three cycles puning occurs with wide load changes and the speech amplifier may be used to raise the level if necessary. In general, keep the knob in the lower two-thirds of its range. The WØHZR tuning indicator is another excellent tool to use with this unit. (See RTTY Nov. 1954, Jan. 1956, and CQ May 1956.

If the "BOBEEP" Expedition" which visited 28 ham RTTY stations had been equipped with this device, much greater service could have been rendered to help the solitary struggling isolated hams solve their problems in making their rusting 26's print U.S.



SIMPLE MARK/SPACE AUDIO OSCILLATOR

R-1 & R-2, Approx. 10,000 ohms, 1/4 watt, see text.

S, Toggle Switch, open for 2975 cycles, close for 2125 cycles.

C-2, Adjust for 2975 cycle oscillation with S open.

C-3, Adjust for 2125 cycles with S closed, after C-2 has been adjusted.

R-3, 100,000 ohm volume control, audio taper, with DPST battery switch attached.

L, Audio choke or Toroid coil. With 88 mh telephone type toroid, C-2 and C-3 will probably end up just under 0.05 mfds each.

EARLY RTTY EXPERIENCES

BY E. L. "HY" HYMEL, W5ENH

After reading Bob Weitbrecht's very interesting autobiog in the July issue, thought perhaps some of the fellows might be interested in a few highlights of my RTTY experiences.

My first introduction to the "thundering twelve" was back in '37 when I went to work for AP as a "printer-attendant." While performing those duties, I learned the keyboard and gradually came up to "operator-attendant." Left AP in early '40 and cast my lot with the War Department as Administrative Net Radio Operator. (Nothing much doing with teletypes here, except WU biz.) Our favorite "Uncle" wanted my services beginning in July '43 and '45 found me on duty with Radio Security Section in Manila. We would monitor assigned frequencies of aircraft, airfields, administrative nets etc. for breaches of security and operating procedures. Meanwhile, we had a brand-spanking new 15-type "field printer" which was just taking up space in one of the trucks. We also had an inked slip-tape recorder which nobody in the outfit could read (including myself). Now, here were two wonderful pieces of equipment that were contributing absolutely nothing to the war effort!! (Do you begin to see the possibilities?) I installed a pair of contacts on the slip-tape recorder and hooked the 15-type into 'em. A bit of detuning of the Super-pro brought in the purtiest five-letter code groups you ever saw banged out on a printer!! I cleaned up the haywire a bit and "doctored" the front end of the recorder to cut down on the QRMary and took my discovery to the "old man." He in turn took it to the "front office." I learned that the RTTY station I had been copying was none other than the Air Forces station on Leyte. The "brass" wanted me to monitor it on a 24-hour basis and it was then that I squirmed because with our fluctuating line voltage (5kw MG gas-driven) and the inherent instability of the HF oscillator of the Super pro it was necessary to "ride the BFO" control quite frequently and I just couldn't see myself sitting there with my hand on the knob, eating my meals with the other, 24 hours a day!! Also in the outfit were a couple of BC-221 freq meters. Here, I thinks to myself, is a wonderful, rock-solid oscillator. But it "ain't got enuff poop" to even drive a receiver. I scrounged the entire island, trying to beg, borrow or otherwise obtain some regular RTTY equipment but none to be had—all in use. So I hikes down to an air Force junk yard (junkyard ,indeed; wish to hevvin I could have lugged some of that junk back home) and rag-picked enuff stuff to build up a 3-stage RF amplifier, doubler and class "A" isolating amplifier. Hooked 'em up and into the pro—there she is; a rock-solid receiver at last!! The "brass" came over to inspect the set-up. I heard one of 'em mumble "Just a lotta junk." But a General out-ranked him with "But it works damn good!"

During my monitoring sessions, I observed a little WAC operator "shooting the breeze" with a lover-boy on Leyte. Just a short note at first, but we wrote it up into a report. We learned she was relieved from duty and restricted to quarters for two weeks. A couple months later I caught her again. This time she was busted from a buck sergeant to "yardbird." This may sound heartless and "chicken" to some, but after all, that was our job. To curtail such operating techniques and to prevent anyone from passing out some choice tid-bit of information that may have been useful to the enemy. Well, the crowning climax came when one day I noticed a lot of apparent (at first glance) drivvel coming on the printer. It turned out to be a half-page of single spaced chit-chat her boy friend on Leyte telling what the weather was, what it had been, how long she had been there, when she expected to leave, what her duties were and other bits of classified material. The dear girl must have thought the enemy awfully stupid and naive because she had first cut the tape and then—ran it thru backwards. (Which was an old trick I used to pull with AP). This one did it—she was given a summary court-martial and relieved from further communication duties. I know this sounds harsh but as I have said—it was our job and the war situation was most uncomfortable.

Haven't been active for the past 3 or 4 months but have moved all my gear down to the basement and hope to be able to answer "roll call" in the very near future. Want to clean up and make a few additions to the "Pat" converter first, however.

"WHAT HAMS TALK ABOUT"

"When a stranger learns I operate an amateur station, the first question he asks is, "how far can you talk?" Invariably this is followed by, "what do you talk about?" A thumping lie takes care of the first question, but answering the second has always bothered me. To learn what hams really do talk about, I made a survey . . . the following is the list of subjects noted in exactly the order in which they were heard from June 15 to September 15 of 1953.

A sixty-foot tower, no time to operate, automobiles, S.S.B., TV service, weather, taking care of yard, a mutual friend, ham receivers, new house, advantages of unlisted telephone, Kinseys book on the female, long-winded messages, a fight at a dance, fishing, crowded band conditions, building a phone patch, TVI, attending a circus, self-supporting tower, hot weather, playing pool, fishing for pike, the German language, low-pass filters, inboard boats, eyesight of a sparrow, fly-swatters, heavy traffic, EX-YLS opinions of hamfests, How to use field-strength meter, circus acts, robbing the baby's bank, recording equipment, southern accents, low-pass filters, gas station business, TV boosters, life in Arabia, line noise, moonshine stills, cashing checks in a strange town, going to dentist,, how to cold-shoulder visitors who invite themselves to see your TV, hamfest prizes, county fair, chlorophyll, trip to Florida, life in a trailer, six-year-olds first impression of school.

I was rather surprised to note that only 26 per cent of the QSOS were related to amateur activities. Some other interesting deductions can be drawn from a study of the list.

W9EGV

AN AUDIO FREQUENCY DISCRIMINATOR CONVERTER*

BY ELWIN J. O'BRIEN, W6LDG, EX-W9GND, W5MHW

A universal type TTY converter independent of frequency shift and usable on either AFSK or FSK signals is a desirable piece of equipment for the teleprinter operator. This paper is a summary of the development of such a converter.

The decision to use either AFSK or FSK signals influenced the design in favor of an audio frequency discriminator type unit. To handle the AFSK signals now in general use, a center frequency of 2550 cycles was set with a maximum frequency shift of plus or minus 450 cycles. For the FSK signals, the center frequency can always be adjusted to 2550 cycles with the beat oscillator on the receiver. The narrow shift requirement for the universal converter was met by adjusting the sensitivity and efficiency of the audio discriminator to operate on plus or minus 75 or more cycles.

Having determined the center frequency and the maximum shift, the pass band filters were designed for 2000 to 3000 cycles.

The design approach used was to eliminate as much noise and/or interference signals as possible from the input of the discriminator by using a band pass filter. This was followed by a limiter to meet the requirements of constant amplitude signals at the discriminator. The 40 to 50 db of fast limiting also provides for fading of either or both of the tones.

The square waves from the limiter are restored to sine waves by another band pass filter, followed by a low pass filter with infinite attenuation at 4250 cycles. The low pass filter was added to get good sine waves at the low end of the pas band.

The audio frequency discriminator or synchronous detector also requires a 90 degree phase shifted reference voltage to compare with the output of the differential diode detector to produce a frequency sensitivity device. This reference voltage is obtained from a tuned circuit with a variable inductance tuned to the center frequency of 2550 cycles. The discriminator action can be analyzed as equivalent to the r. f. type discriminator used on f. m. signals.

For positive action, the dc amplifier with cathode clipping is direct coupled to the discriminator. The coupling capacitor which passes the pulse signals to the keyer tube allows the print circuits to return to normal on steady tones.

The dc restorer circuit in the grid of the keyer tube has a relatively short charge time constant and a long discharge time constant. The size of the components and time constants were selected to give proper dc restorer action and at the same time to pass the keyer pulse signals with the least waveform degradation. It will be noted that no grid return resistor is used from the keyer tube grid, since the back resistance of the diodes forms the return. The The two 1N67 diodes in series were necessary because the 110 volt pulse formed when the clipped tube conducts will cause a single diode to reach the zener breakdown. The waveform at the grid of the keyer tube is a reasonably good square wave and rises to a peak within the time of a few cycles of the audio tone, indicating some distortion. The model 26 printer when operated with a 1A tape reader through a 26 distributor, a tone generator and the converter, prints RY's with a total range of 65, showing only 15% distortion for the converter and tone generator. The same 26 machine, when a dc loop is keyed, without the generator and converter produced the ideal range of 80. The range control on radio received signals was equally good.

On air test, this converter prints very good copy through noise and selective fading of the tones on either wide or narrow shift. Solid copy has been obtained on the 40 meter band through local interfering c. w. signals that were outside the pass band of the filters. Copy has also been obtained when the interfering signal is weaker than either of the desired signal tones. When the interference is equal to or stronger than the desired signal, the printing is garbled.

The circuit diagram shows all operating ac and dc voltages throughout the unit and is self explanatory. Full limiting is obtained for all input signals of .05 volts or higher and no top limit to the input voltage has been found, as it would take the 10 volt full output of the test oscillator. Further information on the theory and design of the unit will be available at a later date.

*Presented at CHI-RTTY, 1956

Season's Greetings

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

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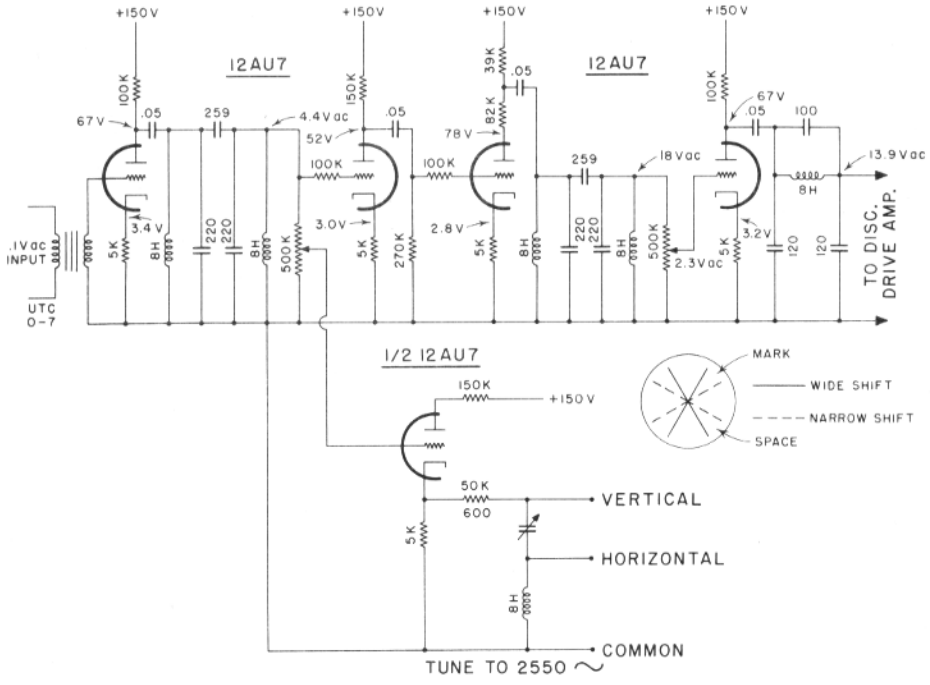
For Information Regarding the Society Contact the Following:

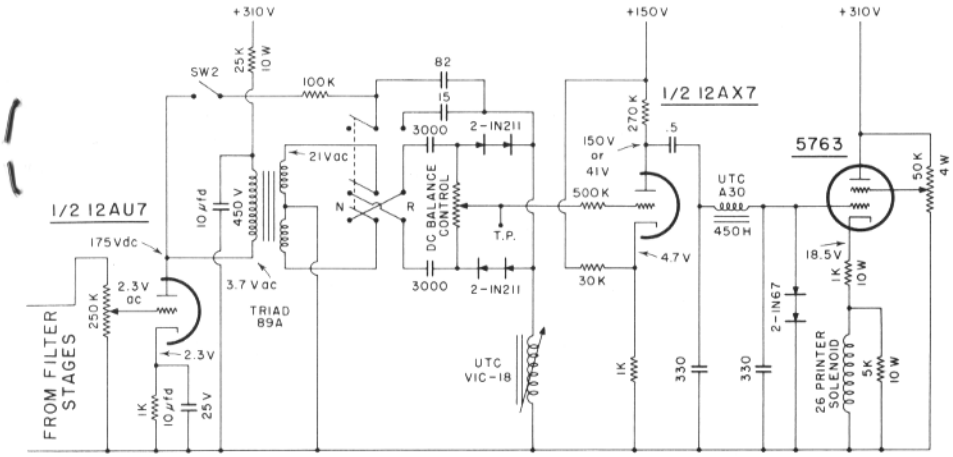
W6CLW—Ed Simmons
W6AEE—Merrill Swan
W6SCQ—Lewis Rogerson

For Traffic Net Information:
W6FLW W6IZJ

For "RTTY" Information:
W6CL W6DEO W6AEE



FILTER-LIMITER PORTION OF A.F. DISCRIMINATOR CONVERTER



SET DC BALANCE FOR ZERO VOLTAGE AT T.P. WITH SW2 OPEN
TUNE VIC-18 FOR ZERO VOLTAGE AT T.P. WITH 2550 CYCLES INPUT TO UNIT

DISCRIMINATOR-KEYER PART OF A.F. DISCRIMINATOR CONVERTER

"I note with interest your lead article in the August, 1956, issue—particularly in reference to the use of 'some of the high-speed Sigma relays without the required DC.'

As you know, we have been subscribers to your magazine for three years (isn't it time our subscription expired?). Your articles on the construction of terminal units have been extremely interesting and useful—in fact, some time ago, we built a W2PAT converter and have used it from time to time in experimental work.

I have felt, however, that a few of the finer points of relay operation have been missed. One point in particular is the design of circuits to make the maximum use of the relay, in regard to speed. It certainly is not immediately obvious to all, but in order to obtain high-speed operation, a relay signal should be derived from a relatively high impedance source.

For further discussion of details, I refer you to an article in June, 1956, QST, a copy of which is enclosed.

You will notice that one of these principles has been violated in the circuit diagram shown in Figure 2 of the article in RTTY. I refer to the use of a 6-volt source from which the relay bias current is derived and from the connection of the signal coils in the cathode circuit of the 6Y6 (I am assuming that the connection on terminal I should go to the cathode of the 6Y6, rather than from ground).

In looking up the original Gates circuit, I notice that the B plus is of the order of 350 volts. In view of the above-mentioned principles, I feel that it would be better to eliminate the VR tube (figure 2) entirely and to place the 3-6 coils of the two relays directly in the plate circuit (rather than the cathode circuit) of the 6Y6. The bias coils 2-7 should then derive their current directly from B plus through a dropping resister. Since the VR tube has been eliminated, the total drain on the power supply should be not more than in your original circuit, and perhaps even less.

Voltage regulation should be unnecessary, since any change in B plus voltage would produce commensurate changes in both the signal current and bias current applied to the two relays.

Naturally some change would have to be made to the metering circuit but this should cause no complications. The relay bias current should be varied by means of a series dropping resistor. Note carefully that a shunt resistor across the relay is not an acceptable method. The signal current may be varied by means of either grid or cathode bias on the 6Y6.

Since there are literally hundreds of types of Sigma relays available, not only new but through the surplus market, I would like to offer my services through your columns to answer any questions regarding applying these relays to terminal units. For those unfamiliar with our nomenclature, the Series 7,, and Series 72 relays are the most applicable for this equipment. We have used all three here in our own laboratory. They all come with a wide variety of coil resistances, some are single-coil, and some are dual-coil. The Series 7 and Series 72 relays are polar.

IF ANY OF YOUR READERS HAVE A RELAY ABOUT WHICH THEY WOULD LIKE DETAILED INFORMATION, KINDLY DO NOT HESITATE TO ADDRESS THE WRITER AT THE ABOVE ADDRESS."

Very truly yours,

SIGMA INSTRUMENTS, INC.
L. B. Stein, Jr., W1BIY
Engineering Department
170 Pearl St.
South Braintree,
Boston 85, Mass.

"Received a copy of the Sigma Relay letter of 10-15-56. This letter has a lot of real good information that seems to me the other fellows might be interested in.

I use an 8000 ohm Sigma relay in the KW set as a keying relay and it will follow a 100 WPM tape with no trouble. The entire circuit with the filters looks like this: (Fig. 1)

Now getting down to the comments on the TU. (Fig. 2, August 1956). It seems to me that an error has been made in the reasoning presented. The object of the system presented was to have a clean working system that is safe and does not radiate electrical energy. (Noise)

The relays should be as near ground as possible for several reasons:

1. Reduces amount of metalic shielding necessary.

2. Makes mechanical mounting easier.

3. Safer from shock standpoint. (Who would want to take the can off a relay with 300 volts on it?

4. Places teletype machine at a low potential level.

In addition to the above I feel that the contacts of the TTY machine would have a shortened life with 350 volts on them and that the anti arc circuit (condensers) might not stand up.

In consideration of the regulator tube mentioned, it appears that a misconception of it's function is wide spread. It's prime consideration is to limit the plate voltage on the 6Y6 so the cutoff voltage on the grid is much sharper than an unregulated tube would be, and to require less grid voltage for cutoff—thereby reducing the pulse distortion on the printer. Also it is not the regulation of the 6Y6 circuit that is critical but the effect of the plate supply on preceding stages. The importance of this problem is very great as the time constant of the low power stages often gives trouble, particularly when low speed low frequency hetrodynes are present.

I would like to point out that approximately 2500 ohm internal series tube resistance makes the printer and relay

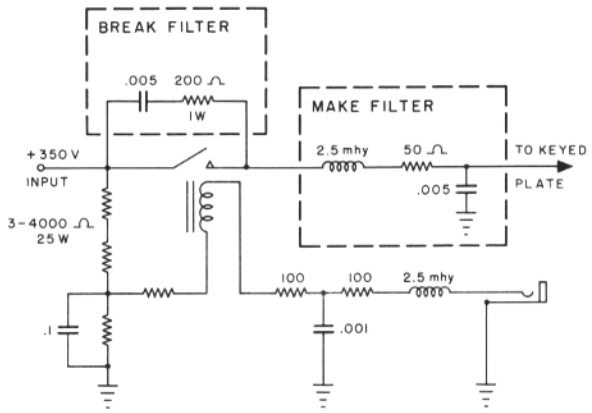


FIGURE 1

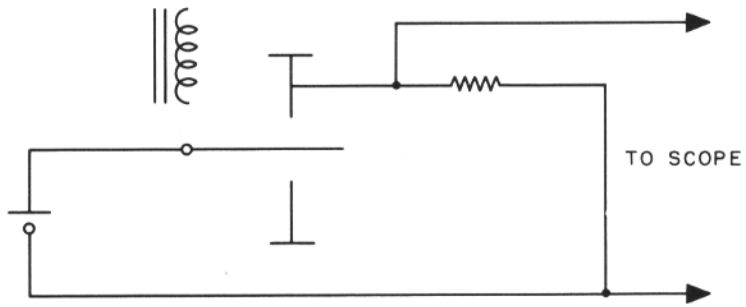


FIGURE 3

CIRCUIT FOR CONTACT CHECK

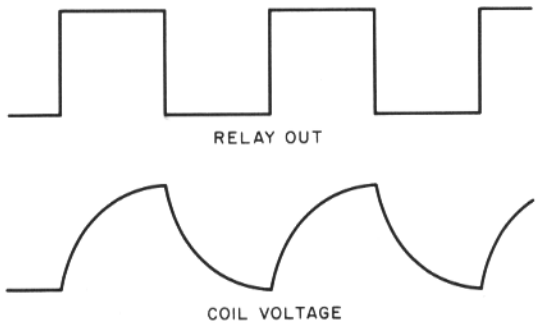


FIGURE 4

WAVE SHAPE COMPARISON

magnets practically a constant current device, which follows the QST article closely, within practical limits.

Supplying 6 volts dc thru the limiting (also current adjusting) resistor does reduce the delay "follow" somewhat more than a high resistor supply does. This concurs with Ray Morrison W9GRW who indicated that Bell System practice is to supply polarizing voltage from a 100-150 volt dc source thru a dropping resistor. He also tried to operate the polar relays from 6 volts with a filter condenser directly across them (as I understood him) and they did not follow properly. Note that there is a series resistor, although small, in the circuit of 3-2. The operation of the relays in the article was checked by using a good scope, a split field electronic switch and a square wave generator. Comparison of input and output waves, with time differential was then available. The relays were adjusted for best follow.

A word as to the speeds involved. The minimum repetition rate of the system is approximately 6 pps. The maximum is approximately 40 pps (pulses per second). Using a square wave input to the grid of the 6Y6 it was found that the relays would follow reliably at 70 pps and sharp enough to print if a printer was used at 90 pps. This was deemed sufficient margin of safety to operate properly. As a final test the keyboard of the TTY machine was used thru the polar relays to key the AFSK oscillator. A tape of the audio was made on the Magnecord. Playing the Magnecord back into the Terminal Unit keys the transmitter and also works the printer. (this is reference to the system described in the August RTTY). Since the signal is going thru the relays twice any minor error would be very noticeable and destroy print. The entire system prints well even under these conditions, indicating the relays follow well.

Fig. 3 Circuit for Contact Check

Fig. 4 Wave Shape Comparison

Conclusion:

1. I think the application does not deviate far from ideal application of relays as discussed in the subject letter, and particularly it does not deviate in the driving section of the 6Y6 at all.

2. Connection of the relays as suggested in subject letter is very dangerous.

3. Elimination of the VR tube is not feasible.

4. The unit works well as it stands.

The offer of the Sigma Relay people to provide information and help is a very fine gesture on their part. I for one will be glad to see some of the more sensative relays available in a low voltage low resistance type suitable for operation from 6-12 volts dc.

If it is satisfactory with them I would like to see you print their discussion in the Journal as I am sure a lot of the fellows do not know much about the theory of relay operation and that the information passed along will give them an insight to some of the problems.

Thanks again for all the help and hope to see you soon."

Yours truly,

Dave

"Sometime ago, W9TCJ asked me about Teletype operation on fast 404 OPM. His unit worked fine and he wanted to know if there was any harm in copying the fast speed. I looked up the timing diagram for the unit and told him that there was sufficient "rest" time so that the unit would perform faster without harm. My point is that if it would help your RTTY, I would be willing to act as technical advisor for engineering questions pertinent to the Teletype equipment.

I have clearred the idea with the legal department and they saw no objection particularly in our older units in which all patents have expired. This is just a thought and reflects the management attitude toward helping the fellows when and whereever possible with RTTY work.

Hoping to hear from you when convenient.

Ray Smessacrt
Ray — W9MDQ
Teletype Corporation
1400 Wrightwood Ave.,
Chicago 14, Ill.
Product Development
Department — 1430

COVER PHOTOGRAPH

FLASH!!

I have a new baby brother.
He was born October 5, 1956 and he weighed 6 lbs. 14 ozs.

Mommy Lydia and Daddy Byron have named him
PETER GORDON KRETZMAN

73—Hollis Kretzman, 1st Jr. Op.
at W2JTP

Traffic Net News

By 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 SEPTEMBER, 1956

Sept. 4—W6FLW, N. C.—26 Checkins

W6ADD	W6IZJ
W6AEE	W6JAU
K6BPI	K6JDN
K6BTK	W6KUM
W6BWG	W6LDG
K6BWJ	W6OJF
W6CK	W6ORF
W6CKS	W6PZV
W6CMQ	KN6QQV
W6FBF	W6SCQ
W6FLW	W6VAD
W6FNW	W6WCH
K6IHG	W6ZBI

Sept. 11—W6LDG, N. C.—26 Checkins

W6ADD	W6IZJ
W6AEE	W6JAU
K6BPI	K6JDN
K6BTK	W6KUM
W6CK	W6LDG
W6CKS	W6OJF
W6CLW	W6ORF
W6CMQ	W6PFF
W6CZ	KN6QQV
W6DYB	W6SCQ
W6EV	W6ZBV
W6FBF	W6PZV
W6FLW	W6QHR

Sept. 18—W6LDG, N. C.—19 Checkins

W6ADD	W6FBF
W6AEE	W6ICS
K6BPI	K6IHG
K6BTK	W6IZJ
W6CKS	W6LDG
W6CLW	W6OJF
W6CMQ	W6PZV
W6CZ	W6SCQ
W6DBY	W6ZBV
W6EV	

Sept. 25—W6LDG, N. C.—26 Checkins

W6ADD	K6IHG
W6AEE	W6IZJ
K6BPI	W6JAU
K6BTK	K6JDN
K6CHU	W6JFZ
W6CKS	W6LDG
W6CLW	W6OJF
W6CMQ	W6ORF
W6CZ	W6PZV
W6DYB	KN6QQV
W6EV	W6SCQ
W6FBF	W6VAD
W6FLW	W6ZBV

ACTIVITY FOR THE MONTH OF OCTOBER, 1956

Oct. 2—W6PZV, N. C.—23 Checkins

W6ADD	W6JAU
W6AEE	K6JDN
K6BPI	W6LDG
K6BWJ	W6OJF
K6CHU	W6ORF
W6CKS	W6PZV
W6CMQ	KN6QQV
W6DYB	W6SQM
W6EV	W6SCQ
W6FLW	W6VAD
K6IHG	W6ZBV
W6IZJ	

Oct. 9—W6CK, N. C.—22 Checkins

W6ADD	W6FBF
W6AEE	W6FLW
W6BPG	K6IHG
K6BPI	W6IOK
K6BTK	W6IZJ
K6BWJ	W6JAU
K6CHU	W6LDG
W6CKS	W6OJF
W6CK	W6SCQ
W6CZ	W6VAD
W6DYB	W6ZBV

Oct. 16—W6PZV, N. C.—25 Checkins

K6BPI	W6JFZ
K6CHU	W6KUM
W6CKS	W6LDG
W6CLW	W6OJF
W6CMQ	W6ORF
W6CZ	W6PZV
W6DYB	KN6QQV
W6EV	W6RL
W6FLW	W6SQM
K6IHG	W6SCQ
W6IZJ	W6WYH
W6JAU	W6ZBV
K6JDN	

Oct. 23—W6PZV, N. C.—26 Checkins

W6ADD	K6JDN
K6BTK	W6JFZ
K6BWJ	W6KUM
K6CHU	W6LDG
W6CK	W6OJF
W6CKS	W6ORF
W6CLW	W6PZV
W6CMQ	W6QFY
W6CZ	KN6QQV
W6FLW	W6SCQ
K6IHG	W6SQM
W6IZJ	W6VAD
W6JAU	W6ZBV

Oct. 30—W6PZV, N. C.—26 Checkins

W6ADD	W6IZJ
W6AEE	K6JDN
K6BPI	W6KUM
K6BTK	W6JAU
K6BWJ	W6LDG
K6CHU	W6OJF
W6CK	W6PZV
W6CKS	KN6QQV
W6CLW	W6RL
W6CMQ	W6SCQ
W6CZ	W6VAD
W6DYB	W6ZBV
W6FLW	W6ZVO

ACTIVITY FOR THE MONTH OF NOVEMBER, 1956

Nov. 6—W6FLW, N. C.—24 Checkins

W6AEE	W6LDG
K6BTK	W6OQI
W6CKS	W6OJF
W6CMQ	W6ORF
W6CZ	W6PZV
W6EGZ	W6QFY
W6FLW	KN6QQV
W6IZJ	W6SCQ
W6JAU	W6SQM
K6JDN	W6VAD
W6JFZ	W6WYH
W6KUM	W6ZVO

Nov. 13—W6FLW, N. C.—26 Checkins

W6ADD	W6JAU
W6AEE	K6JDN
K6BPI	W6OJF
K6BWJ	W6NCP
K6CHU	W6QFY
W6CK	KN6QQV
W6CKS	W6SCQ
W6CMQ	W6SQM
W6DYB	W6TLI
W6FLW	W6ZBV
W6ICS	W6ZVO
K6IHG	W6JFZ
W6IZJ	W6KUM

Nov. 20—W6FLW, N. C.—28 Checkins

W6AEE	W6JAU
K6BPI	K6JDN
K6BTK	W6KUM
K6BWJ	W6LDG
W6CAP	W6OJF
KK6CHU	W6ORF
W6CLW	W6PZV
W6CMQ	K6QFY
W6CZ	KN6QQV
W6DYB	W6SCQ
W6FLW	W6SQM
W6HGY	W6WYH
K6IHG	W6ZVO
W6IZJ	W6TLI

Nov. 27—W6FLW, N. C.—28 Checkins

W6CKS	KN6QQV
W6CZ	W6SCQ
W6DYB	W6SQM
W6FLW	W6WYH
W6ICS	W6ZBV
K6IHG	W6ZVO
W6JAU	W6ADD
K6JDN	K6BPI
W6KUM	K6BWJ
W6LDG	W6CAP
W6OJF	KK6CHU
W6ORF	W6CK
W6PZV	W6CKS
K6QFY	W6CMQ