RTTY


The American Radio Relay League, Inc.
COMMUNICATIONS DEPARTMENT
West Hartford, Conn., U. S. A.

This certifies that CARL F. SCHULTZ, W6CG residing in the LOS ANGELES Section of the SOUTHWESTERN Division has been appointed

Official Observer

and is eligible to engage in Class 3-4 checks. He agrees to cooperate in checking signals and notifying operators who, by careless disregard of regulations, jeopardize the privileges of all amateurs.

Classes of OO work are: I. Precise frequency checking. II. General frequency checking (±5 Kc. at 14 Mc.). III. Radiotelephone checks: Modulation, stability, quality. IV. Radiotelegraph and radioteletype checks: Notes, clicks, chirps, stability. All Observers will send cooperative reports to stations heard radiating spurious emissions or improperly strong harmonics.

In Witness Whereof, we have hereunto affixed our signatures.

JULY 4, 1961 — Date of Appointment — F. E. Handy, Communications Manager — Section Communications Manager

In view of regular reports and continuing activity, this appointment is continued in effect by endorsements as follows:

Date — SCM — Date — SCM

OFFICIAL OBSERVER (RTTY)

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NEWS OF AMATEUR RTTY

August 1961
30 Cents
Vol. 9, No. 8

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: Brand new, in box 110V AC supply for Model 28, $15.00 PP. A. Clark, W4IYT, 41 Lenape Drive, Miami Springs 66, Fla.

FOR SALE: Gears for 15, 74912/74913, 14 TD 80166/80167, 14 printer 78509/78510, FRXD 78509/78510 . . . Also parts and service — K7ABB

FOR SALE: Model 15 with kybd, cover, table, 255A relay, RA-87 rect., and one channel AN/FGC-1 — $125.00 Western Union 5B Distributor $18.00 — Charles Bell, W9NCA, 4818 West 23rd Street, Cicero 50, Illinois

WANTED: For cash, CV-57/URR in good working condx, with cables and manual, Les Benson, WØZB No. 4 Williamsburg Drive, Saint Louis 41, Mo.

FOR SALE: TM-11-352 Manual for TG7/Model — WØSFF 1212 North Broadway, Crookston, Minn.

FOR SALE: Model 14 TD, MXD, 14 typing reperfs — W9GRW 8029 Keeler Avenue, Skokie, Illinois

FOR SALE: Model 14 non-typing reperf complete with cover and sync motor, excellent condx and appearance $120.00 or will trade for AN/URA6 Group CV-57 dual diversity TU unit in good condx. Henry Hall, W4MGT 334 Grosvener Ave., Lexington, Ky.

FOR SALE: Typing reperfs, just overhauled, complete, kybd and end of line indicators, covers, some with back space $130 up. Also some TDs $115, model 15 typing units ONLY $40 to $50. W3PYW 2706 Harmon Road, Silver Springs, Md.

FOR SALE: Model 14 strip printer cover $15. 05B like new and manual $60. Model 19 Table, Steel $20. Dual Diversity Converter (DDC-49) and CV182 and pwr supply $75.

WANTED: Model C 808/6RC Teletype control unit.
Model TT-416 (Kleinschmidt)
Model 14 Typing reperf cover . . . Karl F. Kornafel W9BTW, 1110 E. Washington Martinsville, Ind.

PARTS FOR SALE: A.P.R. & S. Post Office Box 290, Independence, Mo.

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

A TRANSISTOR TWIN TERMINAL UNIT

By ELWIN J. O'BRIEN, W6LDG

Introduction

The desire to have a Teleprinter Terminal unit as near perfect as possible led to the following ground rules for the design of a transistor twin T terminal unit.

1. No decrease in total printing range with either a dc loop or tone keyed terminal unit signal
2. Operation on both mark and space signals or on mark or space signals individually.
3. Operates equally well on normal or inverted signals.
4. Operate with less than normal shift signals.
5. Has good signal to noise ratio, ie, selects the signals out of the noise or interference and prints them.
6. Make it an all semiconductor terminal unit.

The experimental work required to meet these rigid specifications finally resulted in the best terminal unit ever used at this station.

The No. 1 specification turned out to be the hardest one to meet and almost required a specification revision. However, by making each functional section of the terminal as near perfect as possible, the resulting small accumulation of tolerance build up did not measureably effect the final printing range. By relaxing the No. 1 specification slightly and a redesign of the filter-discriminator section, the terminal unit can be simplified. The redesign to a more practical terminal unit is planned for a future project.

The schematic shown in Figure 1 was used in the development and construction of an engineering breadboard model.

Figure 2 shows the individual sections that the unit was divided into for study and development.

Printer D. C. Loop

Normally the teleprinter, when used on land line circuits, has a dc loop circuit as shown in the block diagram in Figure 3. The actual line currents for the letters R and Y are shown in Figure 4.

Since the authors model 15 Teletype printer was used for design criteria, the following characteristics were measured. Tot range better than 85 points with the top 105 and bottom at 20. Thus indicati some internal bias but still an excellent a justment. The printer coils, connected series for 20 ma operation measured 2(ohms and one henry with the armatu open and not much greater for the clos condition. The coil current pulled up tl armature at 12 ma and released the armature at 8 ma.

EDITOR'S NOTE

This is printered in interest of generat ing comments. It operates very well, bu is a bit beyond normal TU as far as costs

The equivalent printer magnet circuit with a 5k inductance-kick-suppressor resistor is shown in Figure 5. The charge current equation for this circuit is as follows:

$$I = E/R\,(1 - e^{-Rt/L})\ (1)$$

The relative shape of this curve is shown in Figure 6 and Table I shows the significant timing for 20 ma and 25, 50, 75, and 100 volt power source.

TABLE I

Printer Magnet Pull-Up Time

E Volts	R Ohms	d_1 Seconds	d_2 Seconds	$d_1 - d_2$ Seconds
25	1250	.00073	.00018	+.00055
50	2500	.00037	.00018	+.00019
75	3750	.00024	.00018	+.00006
100	5000	.00018	.00018	+.00000

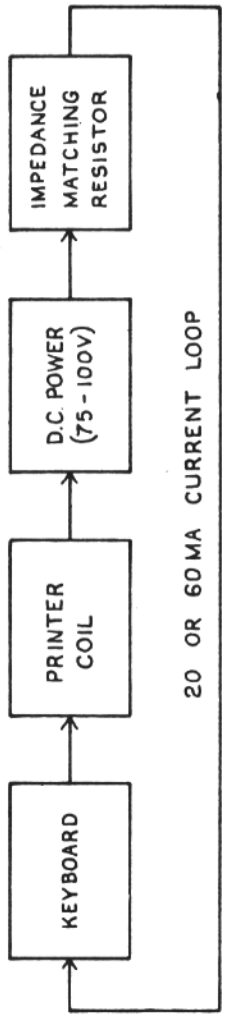
d_1 = 60% charge time (12ma)
d_2 = 60% discharge time (8ma)
Imax = E/ (R_1 + 200) = 10 ma

Mechanical Square Wave Generator

An examination of Figure 4 discloses three important timing rates for a 60 word perminute machine. The longest is the indivdual letter formation time of 165 milliseconds, the next is the time from beginning of the start pulse to beginning of the stop pulse of 132 milliseconds and finally the code selection pulse length of 22 milliseconds. These pulse lengths have the following equivalent frequencies of 3, 3.8, and

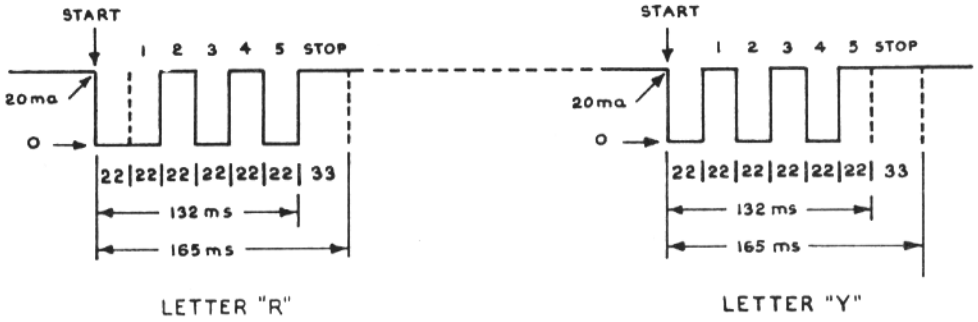
BLOCK DIAGRAM OF TERMINAL UNIT

Fig. 2



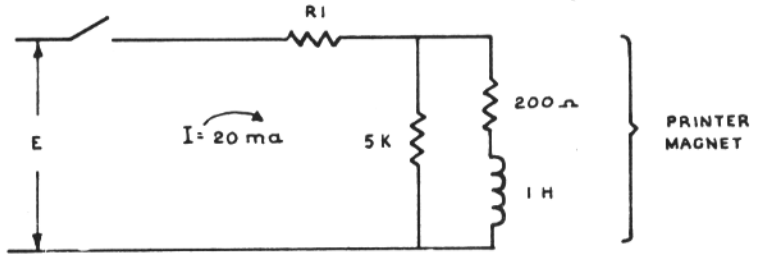
BLOCK DIAGRAM OF D.C. LOOP CURRENT

Fig. 3



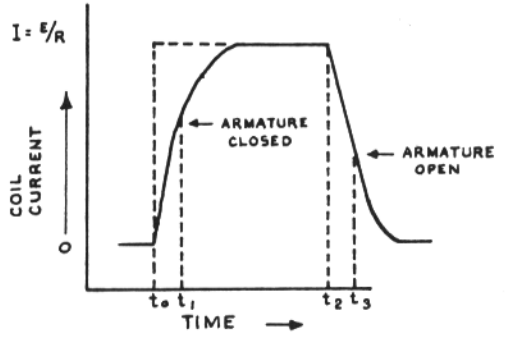
R Y PULSE LETTER FORMATION

Fig. 4



EQUIVALENT PRINTER MAGNET CIRCUIT

Fig. 5



KEYBOARD CLOSE TIME $t_2 - t_0$

ARMATURE CLOSE TIME $t_3 - t_1$

DELAY $d_1 = t_1 - t_0$

DELAY $d_2 = t_3 - t_2$

PRINTER CHARGE - DISCHARGE CURRENT VS TIME

Fig. 6

22.5 cycles per second. Only two of the frequencies, the 3.8 and 22.5 cycles are really important in the design of terminal unit test equipment. The 3.8 cycles frequency is used to test the terminal unit lock up action when only blanking signals are received. As an illustration, if a tape signal with start pulses only (blanking signals) are received and the terminal unit will not pass the complete 132 millisecond pulse as a square wave without excessive trailing edge droop, false printing will result. Actually the drooping pulse will allow mark current to return to the printer loop before the end of the pulse time. If sufficient current returns during the fifth code pulse time the letter T is printed. With a greater drooping pulse other letters are printed such as T. O. M. or V. Under these conditions random noise pulses long enough to trip the start sequence will give random printing of one of the above letters.

A tape sending unit with appropriate T, O, M, & V punched will serve for checking these long pulses. The shorter 22 millisecond pulses will require some means of producing recurrent low frequencies to test the terminal unit with an oscilloscope. The Figure 7 circuit was developed for this purpose. The extra contact on the polar relay is used to key an oscillator or standard audio frequency RTTY tone generator. The wave form can then be easily checked with an oscilloscope.

The letters key can also be used to check the terminal unit for false printing. When false printing occurs try increasing the value of C 25 in Fig. 1.

Printer Magnet Switch

The printer magnet is fundamentally a dc operated device and requires a control switch for pulsing the magnet current. From Table I it can be seen that there will be less than 0.6 millisecond delay bias error for a 22 millisecond pulse and a 25 volt-power source. This is about 3% of the pulse time. The Table I data was calculated for a model 15 printer with a one henry selector magnet. All printer circuits, because of different magnet inductances may not perform with the same low bias error at the 25 volt level. However, a 75 volt minimum supply on a terminal unit should give a low bias error with most printers. Generally a higher voltage is recommended to provide a safety factor.

For a dc local loop monitoring circuit, 25 volts is adequate, because then a reduced printing range can be tolerated.

High reliability transistors (2N43A) were chosen for the experimental switching circuit. These transistors have maximum ratings of 30 volts and to be used at this voltage must pass quickly from saturation to cutoff conditions to limit the maximum power dissipation during the transition time. Individual transistor low voltage operation conditions can be met with the cascode circuit shown in Figure 8a. The circuit shows the quiescent saturation mark voltages for the switches and also the cutoff voltage in parenthesis. Figure 8b and 8c show the circuit modifications for 50, and 25 volt supplies respectively.

This switch circuit is capacitively coupled to the descriminator demodulator circuit to provide printer magnet lockup on long sustained tones. The 4 mfd paper capacitance was required because of the low input resistance of the transistor switch circuit.

A fixed emitter-base bias is provided by R47 to prevent random printing from noise when the tones are not present. The series diodes CR13, CR14, and CR15 are also used for noise suppression. These diodes alone were not sufficient to remove all the noise. They could probably be removed now that R47 is in the circuit.

Discriminator Modulator

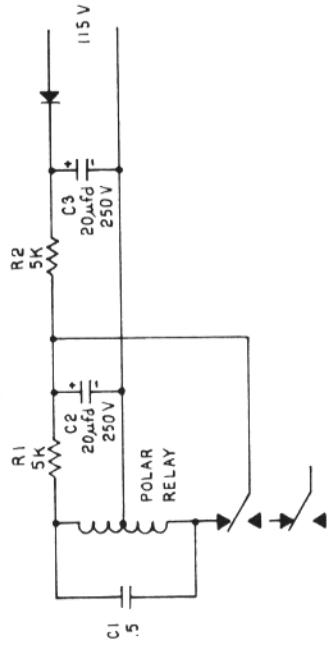
The demodulator and dc smoothing network are straight forward and conventional with the exception that isolation transformers are required to provide the shift in voltage reference from ground to the plus voltage for the printer switch circuit. Since we are attempting to produce an ideal terminal unit, standard wide frequency range audio transformers were used. No attempt was made to determine an optimum transformer type.

The silicon diodes shown in the rectifier bridge circuit can be replaced with a germanium type. In fact the two diodes in each bridge (CR3-CR7 and CR5-CR9) can be replaced with .05 capacitors. When this change is made the capacitor C21 and C22 can be eliminated.

The linear output curve of the discriminator is shown in Figure 9.

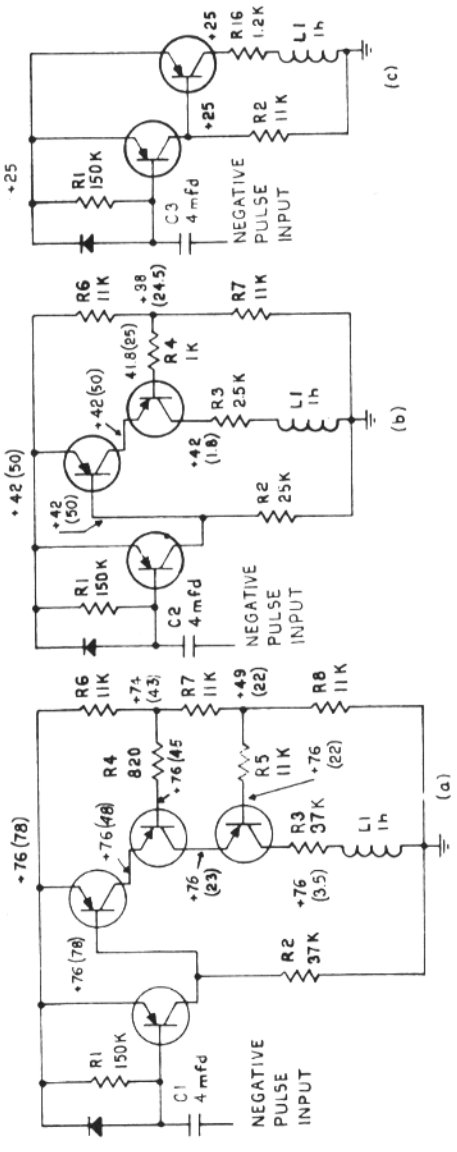
Tone Filters

The tone filters for the unit proved to be a big problem. After designing and testing conventional filters, impedance matching filters and equalizer type filters, they were



LOW FREQUENCY SQUARE WAVE GENERATOR

Fig. 7



PRINTER MAGNET SWITCH CIRCUIT

Fig. 8

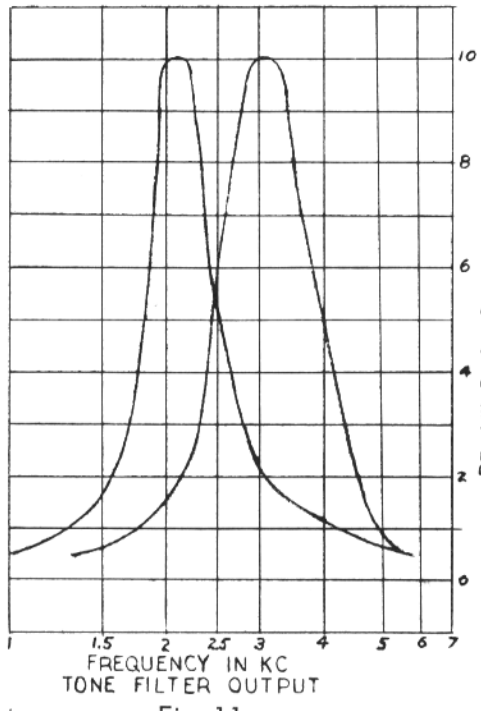


Fig. 11

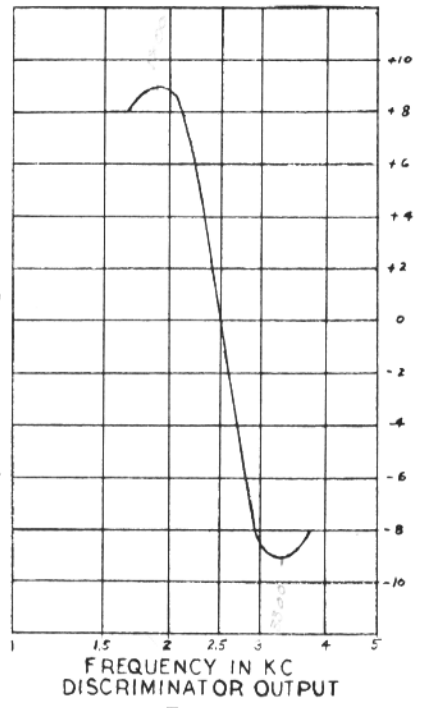
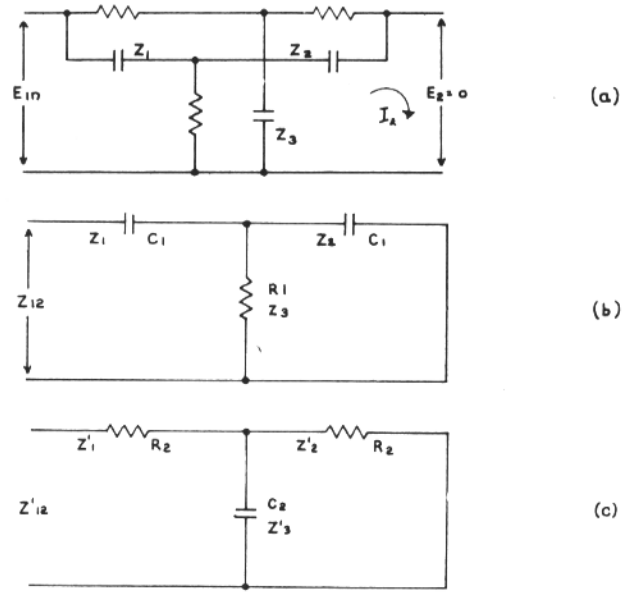
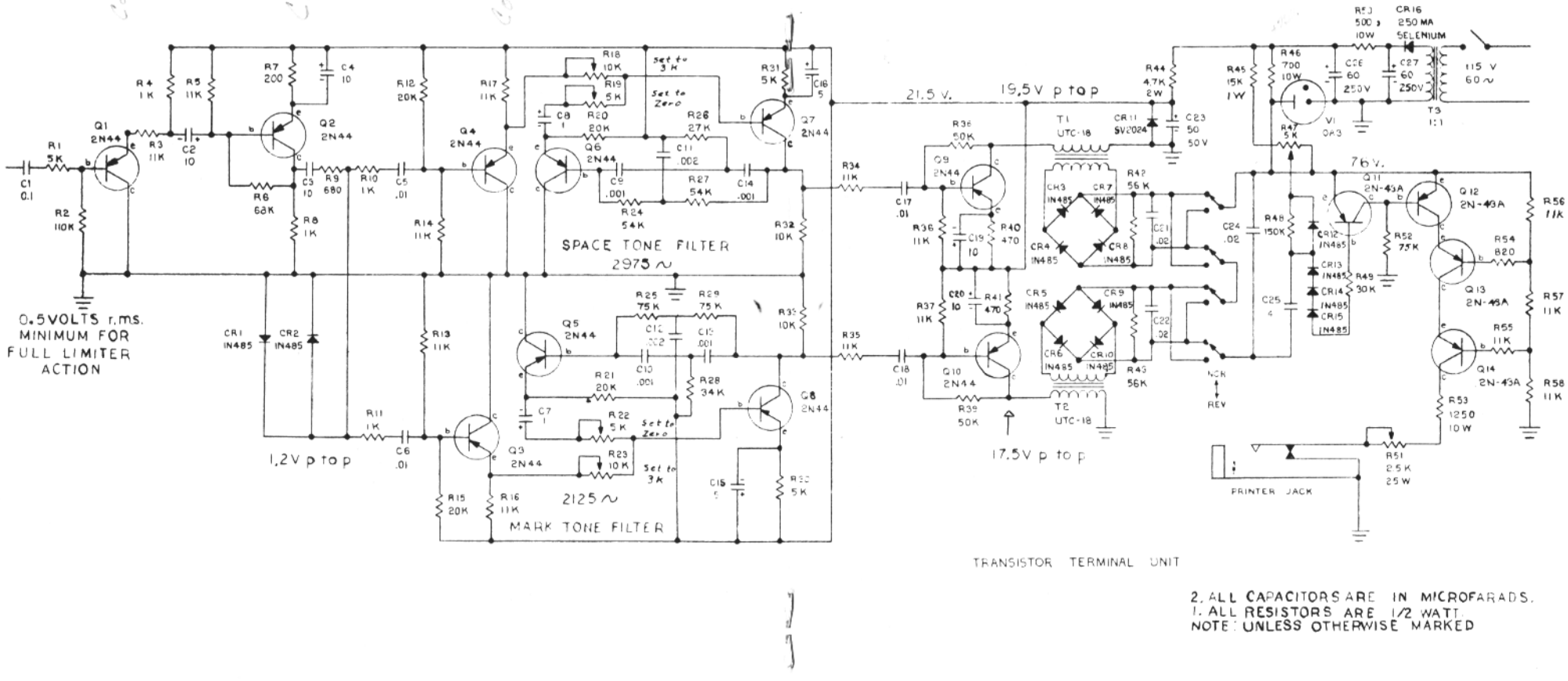


Fig. 9



TWIN "T" NETWORK

Fig. 10



2. ALL CAPACITORS ARE IN MICROFARADS.
1. ALL RESISTORS ARE 1/2 WATT.
NOTE: UNLESS OTHERWISE MARKED

Fig. 1

all discarded because of either poor transient response or delay distortion. Any of these filters would work in a conventional type terminal unit where a small reduction in printing range is permissable.

The twin T feedback-amplifier shown in the mark and space tone filter channels in Figure 1 proved to have good transient and delay response. These twin T networks can be basically analyzed as two independent T sections in parallel with a resulting zero output voltage from the two equal and opposite transmission paths.

Since an input driving voltage produces a zero output voltage, no output current flows and the equivalent circuit, Figure 10 (a) has an apparent short circuit termination.[1]

The transfer impedance of the network then is:

$$Z_{12} = E_{IN}/I_2 = Z_1 + Z_2 + Z_1 Z_2 / Z_3 \quad (2)$$

Using the above transfer impedance equation for each T section path results in:

$$Z_{12} = -(X_2^2/R_1) - j2X_{C_1} \quad (3)$$

for Figure 10(b) and

$$Z'_{12} = 2R_2 + j(R_2^2/X_{C_2}) \quad (4)$$

for Figure 10(c)

These equations show that the Figure 10(b) network has a negative resistance and a capacitive reaction and the Figure 10(c) network has a positive resistance and an inductive reactance. When the two networks are in parallel and balanced the transfer impedance is equivalent to a parallel resonant RLC circuit. This combination makes an excellent notch filter.

If $2C_1 = C_2$ and $2R_1 = R_2$ is used for a balance condition the notch frequency is given by the following equation:

$$f = 1/(2\pi R_2 C_1) \quad (5)$$

and the equivalent of Q of the RLC circuit is 0.5.

When the twin T frequency-selective network[2] is used in an amplifier circuit, the frequency characteristic roughly corresponds to the inverse of the network rejection, resulting in an equivalent parallel resonant single tuned low Q circuit.

Since the effective Q of a twin T feedback amplifier is a function of both the amplifier gain and the network Qt, the band width is set by adjusting the amplifier gain (A).

The following equation gives the resultant Q of the twin T feedback amplifier circuit as:

$$Q = (A+1)Q_t/2 \quad (6)$$

With amplifier gain of 19, a Q of 5 is obtained with a typical twin T feedback amplifier.

The mark-space tone filter-amplifiers shown in Figure 1 are set for an approximate Q of 5.

The relative outputs for the mark and space tone filters is shown in Figure 11.

Limiters

Analysis[3] has shown that limiters followed by broad-linear-discriminator filters will give the best interference and noise rejection for a terminal unit.

The simplest type of limiter or clipper is made with diodes and bias voltage to set the clipping level.

The silicon double diode limiter shown in Figure 1 uses the 0.6 volt zener characteristic of the silicon diode to produce a clipped output level of 1.2 volts peak to peak.

This is an ideal limiter, since it has good overload characteristics and fast attack and release time.

Conclusions

The bandpass filter shown in the block diagram, Figure 2, has been eliminated from the unit. Tests of the unit have indicated that the filter is not essential, since the pass band can be controlled in the receiver. For extremely noisy circuits an external bandpass filter is available for switching in between the receiver and terminal unit.

The remaining problem was to tie each block together with adequate gain amplifiers. First the output of each tone filter was too low to drive the discriminator-demodulator and required transistor amplifier Q_9 and Q_{10} to raise the gain.

The second problem was the input to the limiter. Here the transistor Q_2 was found adequate to drive the diode to full limiting from the 500 ohm output of the receiver. When the low input impedance terminal unit was driven for local copy from the higher impedance of the tone generator used at this station, the input voltage was marginal and the loading reduced the modulation percentage of the transmitter. To solve this problem the high input impedance emitter-fallover with the voltage divider R_3 and R_4 was used.

The OA3 gas voltage regulator tube was used because a 75 volt zener diode was not available. Because of the 30 millampere limit of the OA3 tube the printer circuit is limited to 30 milliamperes maximum. A change to a higher capacity voltage regulator will permit operation of a full 60 milliampere printer circuit.

Finally this project has been an all out one to achieve the definite purpose set out in the six specified ground rules in paragraph one. It is believed that they have all been reasonably met with some sacrifice to simplicity and also component waste. Based on the engineering information gained from the breadboard unit, a more practical unit can be built.

Since the present project has been in process for over a year, it was felt that a report should be submitted at this time. It is hoped that the information will be of some use to other amateurs.

1. W. N. Tuttle, "Bridge-T and Parallel-T Null circuits for Measurements at Radio Frequencies," IRE Vol. 24 pp 23 Jan. 1940.
2. "Vacuum Tube Amplifiers," Chapter 10, M. I. T. Radiation Laboratory Series Vol. 18.
3. Don Wiggins, "Interference Characteristics at FSK Systems," RTTY, Nov. 1960.

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For "RTTY" Information:

W6DEO W6CG W6AEE

RESULTS 1961 ARMED FORCES DAY AMATEUR ACTIVITIES

The unprecedented returns for the Armed Forces Day Amateur Radio Activities have taken a considerable time to assemble, but they are now complete.

For the year 1960, the best one until 1961, the three services issued a total of 389 Certificates to amateurs for submissions of perfect Radio Teletype copy of the Secretary of Defense message. In 1961 this figure climbed to 537. This is quite an increase from the humble beginning in 1958 when 140 perfect submissions were recorded by the Army, Navy and Air Force.

Also, the number of QSOs for the RATT contact portion of the festivities has increased to a record high of 256 in 1961.

As a matter of interest, in 1958 the total Certificates awarded for CW and RATT was 418; in 1959 the combined figure rose to 659; in 1960 to 856; and in 1961 an enviable high of 1273 Certificates were issued. In the QSO department, combined CW and RATT contacts totaled 1407 in 1958. In 1959 this rose to 2194. In 1960, due to the thunder storm activity in the D.C. area, it dropped, coincidently, to 1961. But in 1961 a total of 4246 contacts were recorded by the Army, Navy and Air Force. This can only be the result of the outstanding interest and support of the Amateur Radio Fraternity.

The interest of the American amateur in the Military Armed Forces Day radio festivities is very heartwarming to the three services. Your contribution by publicizing the event assisted us materially in making this year the best ever. Your past contributions are very much appreciated. Such fine support from you in the future will undoubtedly see new records created each year.

The services' Armed Forces Day program coordinators will soon begin preliminary preparations for the 1962 tests. As soon as any release information becomes available, RTTY will be a recipient.

Best wishes to you and all the members of RTTY, Inc.

Sincerely yours,

A. B. KUNZ

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DX - RTTY

BUD SCHULTZ, W6CG
5226 N. Willmonte Ave.
Temple City, California

Howdy Gang:

A million thanks to Jerry, W6TPJ, for the fine job he did in taking over last month's column under very difficult circumstances. The Medicos carried me away to the hospital on the night before the Editor's deadline so good old Jerry answered my QRR and handled things in fine shape. In addition to getting stuck with the column he also inherited the thankless job of making the final draft and tapes of the rules for the "First RTTY World-wide Sweepstakes" which the committee had just completed and approved. The rules are now being circulated thru-out the World so the Committee hopes everyone will have an ample opportunity to become familiar with them before the big week-end arrives. Better plan now on having that new beam up and that linear repaired before Oct. 21st.

Top headline this month is the awarding of three more WAC-RTTY Certificates!! The three newest members to this exclusive group are W6TPJ, G3CQE and W6LIP. This makes a grand total of ten WAC-RTTY certificates issued since the start of this award. Congratulations, fellers, glad to have you aboard!! Hope we have a lot more applications after the big October Sweepstakes.

By way of Jan, PAØFB, and K3GIF comes word that LA1NF is the first RTTY licensed ham in Norway. The report states that the NRRL managed to get a number of Norwegian Army surplus tape printers and has made them available to the hams in that country for six dollars per unit. Many of the hams over there are buying them but so far LA1NF is the first to be licensed for RTTY. PAØFB wrote to him offering assistance and hopes to have more information on this situation shortly. Jan has been keeping PAØFB on the air regularly with operation on both the 14 and 7 Mcs. bands. Bill Brennan, G3CQE, sent in his usual newsy letters from Norwich this month. Bill says that John, G3BST and Geoff, G3-FHL are the latest of the UK group to work FSK contacts into North America. Bill reports further that G3FHL is taking a vacation in Denmark and is going to hunt up OZ9DR and chase up his RTTY activity!! Another interesting comment from G3CQE's letter concerns the fact that the Singapore RAF Radio Club Station, VS1GZ, is trying to get some TTY gear for use of the members. Alan, VS1KS, is the Club Secretary and says that any info or books on RTTY would be greatly appreciated. The QTH is VS1GZ, RAF Changi Radio Club, Signals Centre, Changi, Singapore. G3CQE and K3GIF had a very successful FSK contact on the new 7040 Kc frequency this month and both are very enthusiastic about the prospects for continued contacts here when the HF bands get real poor.

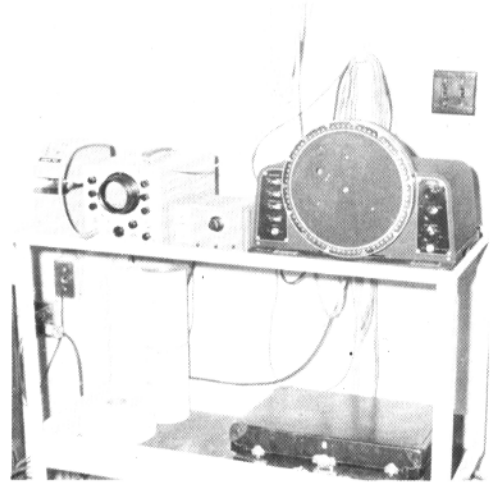
Mailbag this month also had a couple of nice letters from the "Dark Continent" gang. Henry, ZS1FD, sent in a fine resume of his European travels but it proved so interesting that the Boss Editor wanted to run it as a feature so I will not comment on it except to thank Henry for his efforts in keeping us informed. Ossie, ZS6CR, has his TU working fine and is printing in excellent shape now. He reports that now he is waiting for a new SSB exciter and better DX conditions.

The Pacific area has been very lively with lots of RTTY DX showing up on all bands. Eric, VK3KF, had a chance to demonstrate the capabilities of his TTY gear to Bill, VK2EG, and Doug, VK3IJ, during a recent meeting of the "Antarctic Club" in Melbourne. Both Bill and Doug showed that they could really feel at home on the green keys and left Eric's shack under a full head of steam—resolved to get going on RTTY soonest. Here's a quote from Eric's copy: "Have the new exciter finished and tested. Eight watts on all bands from 3.5 to 56 Mcs. all stages are pre-tuned. I have started on the new P.A. for 10, 15, 20 Mcs. and drilled the chassis for the 20, 40, 80 Mcs. P.A. — when all complete I will be able to put my feet up for awhile." By the grapevine comes word that ZL1WB, ZL3-HJ and ZK1BS are still available for an occasional foray on FSK but this reporter has nothing but rumors to go on. Expect they will be on more regularly now that winter is setting in down there. Ken, KM6BU and Cole, KR6MF, have been doing lots of operating on RTTY during the past few weeks. Both are putting in tremendous signals to the States at this time. Still no reports on G3JFF/MM since he left Singapore. Keep your ear open for Mike around 21,090.

Edwin, PY1KU, continues to make himself available for those who still need a South American QSO on FSK. He has also worked a number of the European gang—including such as G3CQE and PAØFB. Edwin operates on both 14,090 and 7040 Kcs. TG9-AD has been showing up once again with his usual fine RTTY signals. Welcome back, Bob!! Erosa, XE1BI/XE1UNM, sends word that XE1AAU and XE1DDD are two new converts to our cause. They both have printers now and Erosa is helping them with their converters and FSK problems. Erosa points out that XE1AAU is the Attorney for the Mexican Radio League and his conversion to RTTY was a direct result of his acquaintanceship with the late Beep, WØBP/-XEØBP. Erosa also included some excellent photos of the "Project Mercury" tracking station in Guaymas which we hope to print as space permits.

Before I tie the ribbons on this for now I would sure like to thank all of you for the many cards, letters, phone calls, and messages received while I was "Grounded" by the Doc. A special thanks to Ed, K3-GIF, Jerry, W6TPJ, and Merrill, W6AEE, for handling all the loose ends while I was "under wraps" in the hospital.

BCNU 73 — Bud W6CG



GUAYMAS - EMPALME - STATION

W6CG de XE1BI:

I am sending to you as promised some photos of the station Guaymas-Empalme of Project Mercury. They correspond to the official opening of the station on June 26. I was invited to go there, and made the trip in the President's airplanes jcintly with the group of newspaper peoples. It was a great experience to see that specialized equipment working for demonstration purposes. Here is a description of each photo I am sending:

#1. – Entrance to the station grounds. You can see a flat terrain, needed to have as little obstructions as possible. The horizon is almost free of mountains or hills.

#2. – The dept of terrestrial communications.–A row of four model 28's. All communications is via land-wire, via Guaymas-Manzanillo - Tucson - Washington. The encoded signal from the tracking radar is also sent through landwire to the computers. In the same room, not shown there is a lot of Western Electric equipment, power supplies, carrier, etc.

#3. – Test equipment for teleprinters, electronic and conventional.

#4. – Adquisition system antenna. – There are three of these: one for adquisition, beam width 60°, another for radiotelemetry, and another one for communication with the capsule. There is also a tracking radar, beam width 1.5°.

#5. – These racks enclose control equipment for the antennas radar, etc.

#6. – One of the consoles for monitoring conditions in the satellite or capsule. There are three of these consoles, one for the doctor., one for an engineer in astronautics, and a third one for the communication's man. Some conditions observed are fuel, coolant, oxygen–pulse, temperature, respiration, etc. The telemetry equipment can handle up to 90 channels.

#7. – Communications Van. – With capabilities of high or very high frequencies.

#8. – *The official opening.* L to R. – Dr. Druyden, NASA Director, Ing Ricardo Monjes, IGY Director, Ing Mendez Docurro, Director of Institute Politecnico Nacional, Ing Suarez Diaz, Technical Director and the Town's President.

You can use the photos freely, as desired and/or use only those that you feel are of interest. By the way it follows a free translation of the plaque:

"ON JUNE 26, 1961, THE MEXICAN AMERICAN COMMISSION FOR OBSERVATION IN THE OUTER SPACE RELATED WITH PROJECT MERCURY, OPENED THIS INSTALLATIONS DEVOTED TO THE SCIENTIFIC ADVANCEMENT OF THE PEOPLE AND THE SECURITY OF THE EXPLORERS OF THE OUTER SPACE."

Initial address was by Ambassador Dario Ojeda, representing Foreign Relations Dept.

Well Bud, that closes information about Guaymas. Now, other things. Three fellows in Guaymas, American hams, have been given Mexican call letters, just sending their American licenses, portraits and signed petition. Look for XE2BV, XE2BT and . . . (pending). Good argument for reciprocity treaty . . . I am now also in twenty meters, after looking how fifteen is becoming a dead band (for rtty'ers). I am using the mast of the six meter beam as a radiator, and a ground plane of *twenty* radiators.

More RTTY. – Two hams, XE1AAU and XE1DDD have *buyed* two Olivettis machines and a third one a little "canibalized" for parts. I will be with them next Thursday to help them with the converter speed problems, fsk, and so. By the way, XE1AAU is the lawyer of the Mexican League, and was present with me in one of those famous "Beepcast" in which he sent that tape ("Salud Erosa"). He knew Beep while in Mexico and think that this convertion is a direct result of that.

E. Erosa Irabien–XE1BI

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