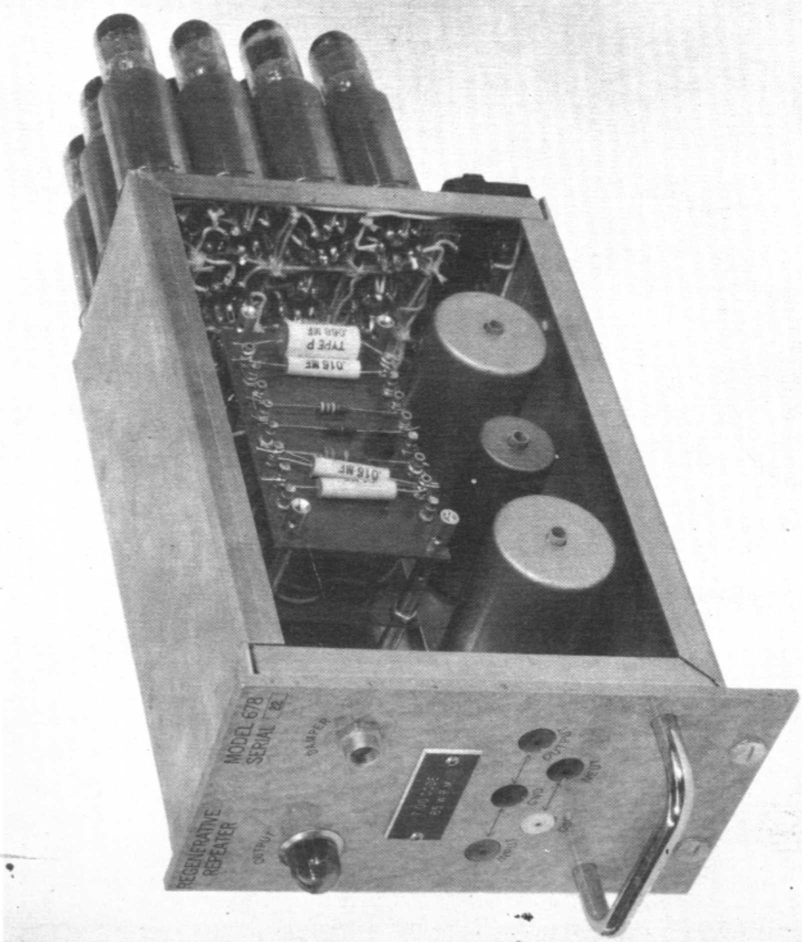
RTTY



Regenerative Repeater

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NEWS OF AMATEUR RTTY

SEPTEMBER, 1960
25 Cents
Vol. 8, No. 9

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.

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WANTED: RTTYs 1959, Jan., Feb., June. 1958 May, July John C. Stenderup, 1217 Madison Ave., Bakersfield, Calif.

A SURE FIRE F. S. KEYING SYSTEM

PART 2

ERIC B. FERGUSON, VK3KF

137 Cole Street, S4, Melbourne, Victoria, Australia

In Part 1 of this series we dealt with the basic portion of the f.s. keyer and its application to a V.F.O. It is now proposed to add another triode tube, a switch and a few resistors broadening the scope of the keyer so that it can be used to key from input lines of either a negative or positive polarity and provide either a "short" or "open" circuit at the frequency shift network for a given element.

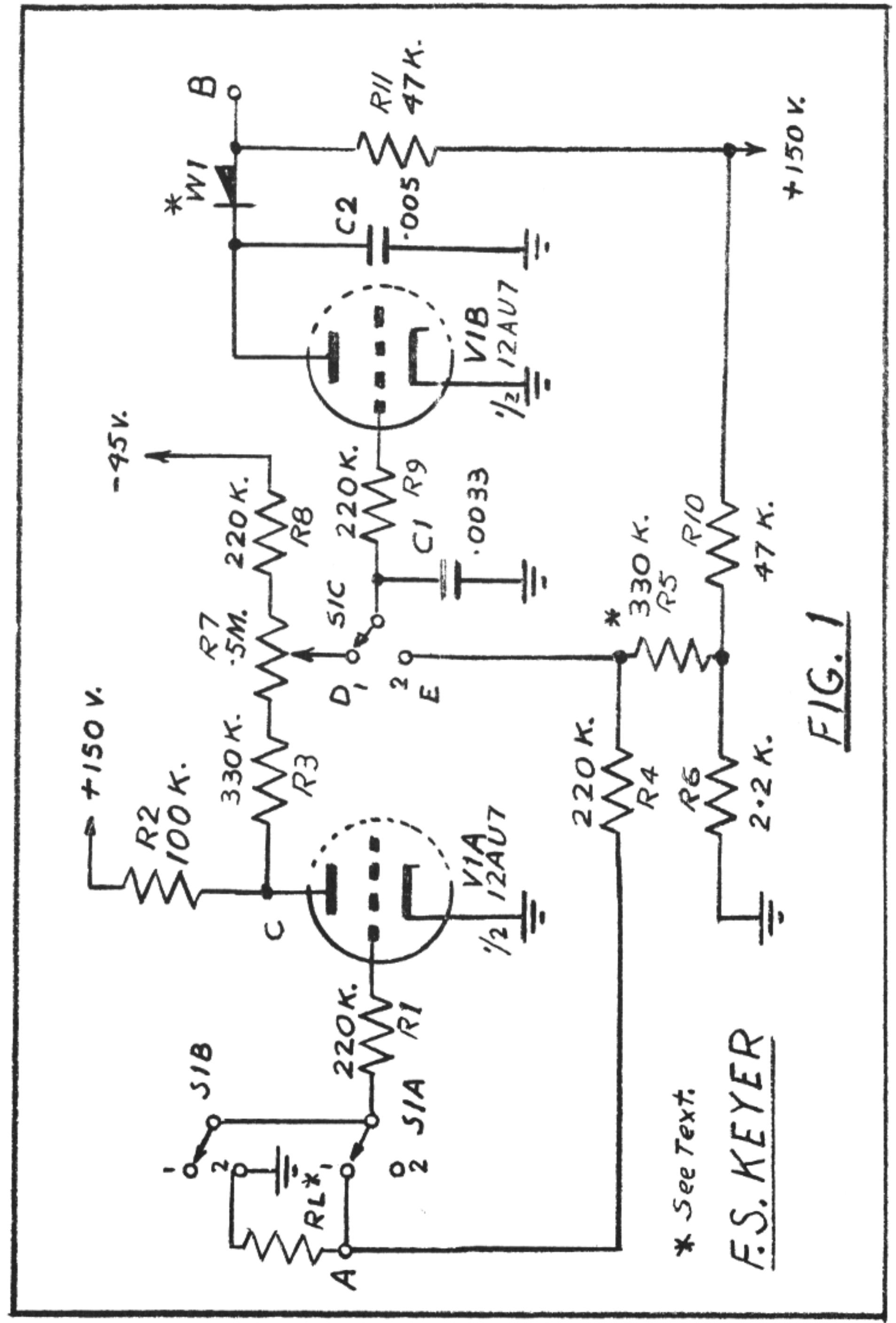
In addition to the keyer, the circuits and application of a versatile frequency shift crystal oscillator are presented. This particular oscillator was developed primarily to provide a high degree of stability on R.T.T. circuits operating under the wide variation of conditions met with in tropical climes.

Firstly the keyer—Fig. 1 illustrated the circuit of the "universal" model. If one compares this circuit with that of the original described in Part 1, it can be seen that with S1 set to position 2, V1A is by-passed, and the circuit of V1B from the keying line input to point B is that of the original keyer and of course will provide the function as fully explained in Part 1.

Consider now what happens when S1 is placed to position 1 and still assuming a mark element to provide from —30 to —40 volts at point A. This voltage is applied to the grid of V1A, the tube is "cut off" and the positive potential at its anode rises toward that of the supply source (150 volts) this rise in positive potential is fed to R7, the opposite end of which is connected to a fixed source of about —45 volts. Let us assume R7 has been adjusted, (to be explained presently) so that the voltage on R9 is now swung positive, V1B will conduct and point B becomes a low impedance with respect to ground, that is, its function from a mark element is opposite to that when S1 is in position 2. It should not require much "brain fag" to work out that we now have provision for switching point B to either "low" or "high" from either positive or negative line potentials.

The addition of V1A and its associate components do not add to the transmitted distortion provided R7 is correctly adjusted. This adjustment is relatively simple. With S1 in position 1, open the keying line ("space"), apply a voltmeter across R11 and adjust R7 until the voltmeter reaches its highest reading, indicating that V1B has reached cut off. Note the meter reading and mark the position of R7 moving arm. Apply a "mark" (negative potential) to the input and observe the voltmeter reading which should drop to about 25/30 volts depending on the internal resistance of the voltmeter. (It is preferable to use a V.T.-V.M. if one is available). Whilst watching the meter, carefully move R7 pointer towards the negative end of its scale. A point will be reached when the meter after rising slowly, will suddenly swing towards a higher reading. Mark the position of R7 at the point of adjustment just before the meter commences the rapid movement. The two marks will indicate the limits over which the keying bias may be safely varied during operation and will represent about 10 per cent mark or space bias. The final adjustment is to place the pointer of R7 to a spot one third of the distance between the two marks away from the positive end mark.

We now come to the crystal oscillator itself. This was developed some six years ago, primarily to provide a high degree of stability on R.T.T. circuits as well, as facilities for "diplex" or "twinplex" as it sometimes named, that is, two independent, simultaneous R.T.T. transmissions on the one transmitter. This is achieved by providing for three rather than one shift frequency, so that a particular degree of shift is produced by any one of four possible, instantaneous mark-space combinations from the keying lines. For the particular service on which this oscillator is used, the shift is 1200 c.p.s. in steps of 400 c.p.s. (M1-M2 zero shift, M1-S2 400 c.p.s., S1-M2 800 c.p.s. and S1-S2 1200 c.p.s.) The complete "diplex" circuit is not included in this article; but if anyone is interested, the author will be pleased to supply details.



The circuit and some details of this crystal oscillator and keyer first appeared in "RTTY" for October 1957, and those of you with this issue on hand will observe a similarity between it and the present article. At the time that I sent the information on the oscillator to my old friend "Cas" KR6-AK, (now WØNMH) who had it published, exhaustive tests had not been completed and improvements have been made since then. However, the method of adjustment is no different to that outlined in the 1957 article.

Contributors to "QST" who have the issues for Jan. 1958 and June 1959 will find therein a crystal oscillator described as a "V.X.O. —A Variable Crystal Oscillator." Comparison of those circuits with that of the oscillator presented here will indicate a close relationship, in that, both make use of tunable reactance in series with the crystal. I do not wish to draw comparisons between the two oscillators; but in the limited time I have had to spare I have found given crystals in the range 2 to 5 Mcs. may be moved further in this version.

Apart from using the oscillator as a stable frequency shift exciter for the RTTY transmitter, it offers itself as a "tunable" H.F.O. in a receiver. It is not everyone who boasts a "rock steady" receiver, particularly those, who like myself, content themselves with one of the older models which operate the H.F.O. at the I.F. frequency away from the signal frequency. On the higher frequency bands quite a bit of drift takes place, particularly during the initial "warm up" period. Most annoying to the RTTY operator.

Before actively engaging in amateur RTTY on 21 Mcs., I constructed one of these oscillators together with a harmonic amplifier tube (6AU6) on an outboard chassis. It proved most satisfactory. The 10th. harmonic of the crystal oscillator on 2155 Kcs. was amplified and injected into the receiver mixer stage. "Pulling" the crystal frequency by means of the tuning capacitor (C3 Fig. 2.) provided a tuning range from 21,000 Kcs. to beyond the low frequency edge of the band, no trouble being experienced in tuning to ZQK on 20,090 Kcs. This meant the fundamental oscillator shift was more than 10—Kcs., though tending towards instability at this figure.

Whilst writing this, it is brought to mind a very able article by Bob Weitbrecht (W6-NRM) "Automatic Start—Remote Control of Unattended Teleprinters" ("RTTY" — June 1957). He mentioned the problem of instability. This form of crystal oscillator used both at the transmitting and receiving ends would overcome this disadvantage.

One problem arises with this form of oscillator, that of the crystal itself. It has been found that some crystals cannot be shifted more than a few hundred cycles, and investigation showed this occurred mostly with crystals of the earlier plated types having physical dimensions about the same as the "air gap" types, it is not recommended that these be used. Experiments have shown the most suitable to be the AT cut crystals in an "air gap," pressure holder. Miniature plated types are satisfactory, but rarely can be shifted as far as the air gap types. The reasoning for this is beyond the scope of this article and no attempt will be made to explain the "whyfor."

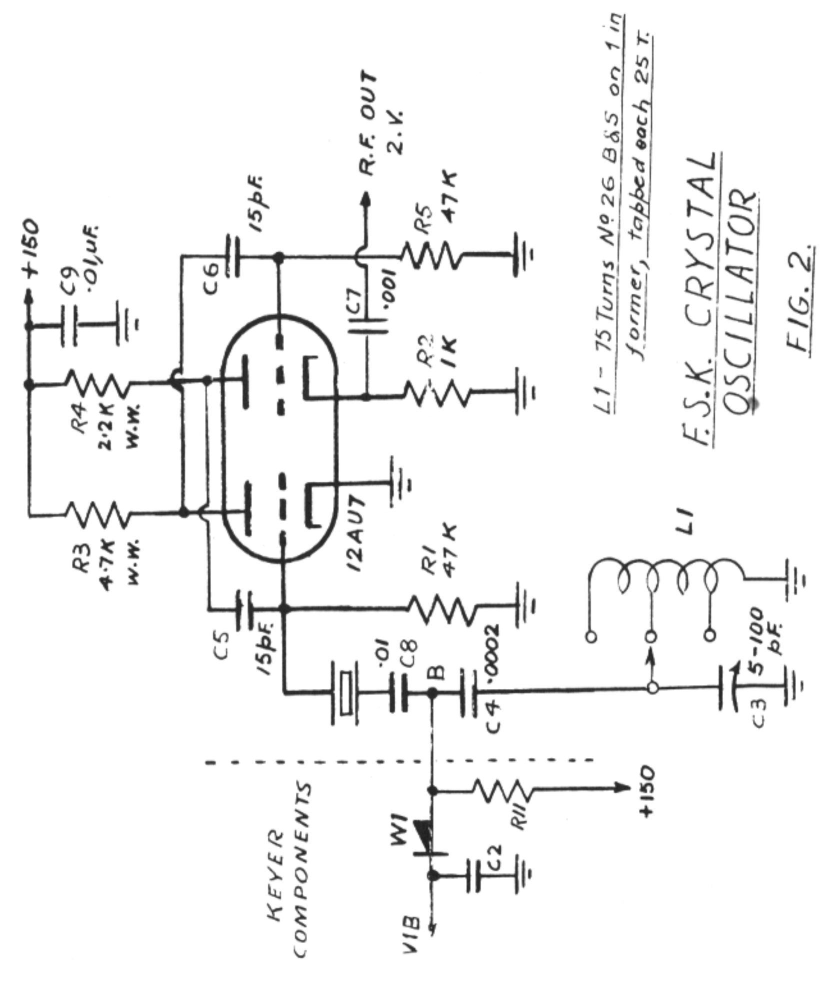
Fig. 2 is the circuit diagram suitable for crystals in the range 2 to 5 Mcs., the critical component values being C5, C6, R3 and R4 which should be within five per cent of the values shown.

The "heart" of the frequency shift network is L1/C3 in series with the crystal. Although not shown on the circuit diagram, a trimming capacity 3-33 uuF. may be placed across the crystal, but for strictly amateur operation, it is not necessary.

L1 has been shown as a tapped inductance; but for those intending to operate from a 3.5 Mcs. crystal, a single winding of 50 turns will suffice.

When combining the oscillator and the keyer, certain of the keyer components should be mounted on the oscillator chassis if separate chassis are to be used. The reason for this was explained in Part 1. The essential components are shown to the left of the dotted line of Fig. 2.

A preliminary test for frequency shift may be made by disconnecting point B from the junction of C4 and C8. Set C3 to minimum capacity and connect the 50 turn tap of L1. Switch on the oscillator and tune in the signal on the receiver. Apply a temporary short circuit across C3 and set the receiver B.F.O. to provide a reference audio output tone, remove the short from C3 and slowly increase the capacity of C3. Gradually at first, then rapidly increasing per degree of angular rotation of C3, the audio note will change either higher or lower, depending on which side of the I.F. the B.F.O.



L1 - 75 Turns No. 26 B&S on 1 in former, tapped each 25 T.

F.S.K. CRYSTAL OSCILLATOR

FIG. 2.

has been set. The frequency of the oscillator itself will change towards a lower frequency and it can be assessed by the receiver beat note how far it can be shifted before the crystal ceases to oscillate; but with L1 unloaded by the keyer it could well be 2 to 10 Kcs., depending on the cut and activity of the crystal. It will be found that if the capacity of C3 is increased past the point where the crystal ceased to oscillate, that is tuning L1 through resonance with the crystal, the crystal will again oscillate but any "shift" obtainable will be in the opposite direction. This is to be avoided if we are to maintain the correct keying form.

Having ascertained that the crystal is shifting, the keyer may be connected at point B. This time the frequency shift adjustments are made whilst monitoring the carrier frequency. A "mark" is applied to the keyer input and the monitor receiver adjusted to provide the "mark" reference frequency. C3 is set to *minimum capacity* and the lowest tap of L1 selected. Remove the "mark" (line open circuit) and carefully adjust C3 to provide the desired space frequency. It may be necessary to advance the tap on L1.

In Part 1 of this series, it was pointed out that germanium, contact type diodes were essential if the keyer was to be applied to this crystal oscillator, the reason given, being the large capacity changes in the diodes during current excursions. If one examines Fig. 2 it will be seen that the diode in series with C2 is in parallel with C3. Therefore any capacity changes in the diode will be reflected on the frequency shift network. Due to the characteristics of junction diodes, their capacity change commences almost immediately current commences to flow. (A type tested exhibited a change from 10 uuF. to 45 uuF. with a change of current from 0 to 5 microamperes.) As the resistance of the diode is still high at low current values, the "Q" of the capacity is relatively high and the effective capacity is added to C3. Therefore, during a mark-space or space-mark transition there is an instant when the f.s. circuit is momentarily detuned even to the extent of resonating it at the crystal frequency causing the crystal to cease oscillating during a portion of the transition time. The result of this is a "healthy click" producing sideband interference, and apart from this the frequency shift itself is momentarily shifted well beyond the 850 c.p.s. during the change—Another cause of sideband QRM.

Some thought was given to the problem. Not every amateur knows the characteristics of that crystal diode reclining in the "junk box." Fig. 3 represents the solution from a strictly amateur point of view. The capacity of the diode is now in series with C3 and the "mark" element appears when the diode is not conducting rather than conducting as in Fig. 2. Now that the "space" is produced during conduction of the diode, it appears when the diode presents its lowest forward resistance which of course "swamps" the capacity. (The forward R.F. resistance of the diode is always lower than either the resistance or capacitive reactance alone). In this condition C3 is virtually grounded. When the mark-space transitions are made, the total series capacity of C3, W1 and C2 can never be that of C3 alone, therefore the detuning effect on the F.S. network is avoided.

It may be argued that there is always a certain amount of tunable reactance in series with the crystal even when W1 is not conducting. This is true, and the effect is, that the crystal may be "pulled" slightly from its natural frequency. However, this pulling is rarely more than 50 to 100 c.p.s., and from an amateur point of view, inconsequential, as in 99.9% cases, the receiving operator has a tunable receiver.

Also commented upon in Part 1 was the necessity for changing the time constants around the keyer to avoid key clicks if a silicon, junction type diode was used. Experiments were conducted with the object of keeping any modifications to a minimum and if a silicon diode is used the only modification necessary to the circuit is to change the value of R5 Fig. 2 from 330 Kohms to 2 Megohms. This also applies to the keyer described in Part 1.

To conclude, here are a few characteristic figures which may assist in "lining up" the keyer. Note points C, D and E of Fig. 2. With —40 volts applied at point A for a mark and zero volts for a space:—

ELEMENT	CIRCUIT POINT A	B	C (volts)	D	E
Mark	—40	+25/30	+125	+10/14	—15/20
Space	0	150	+25/30	—15/20	+2/5

Measurements with V.T.V.M.

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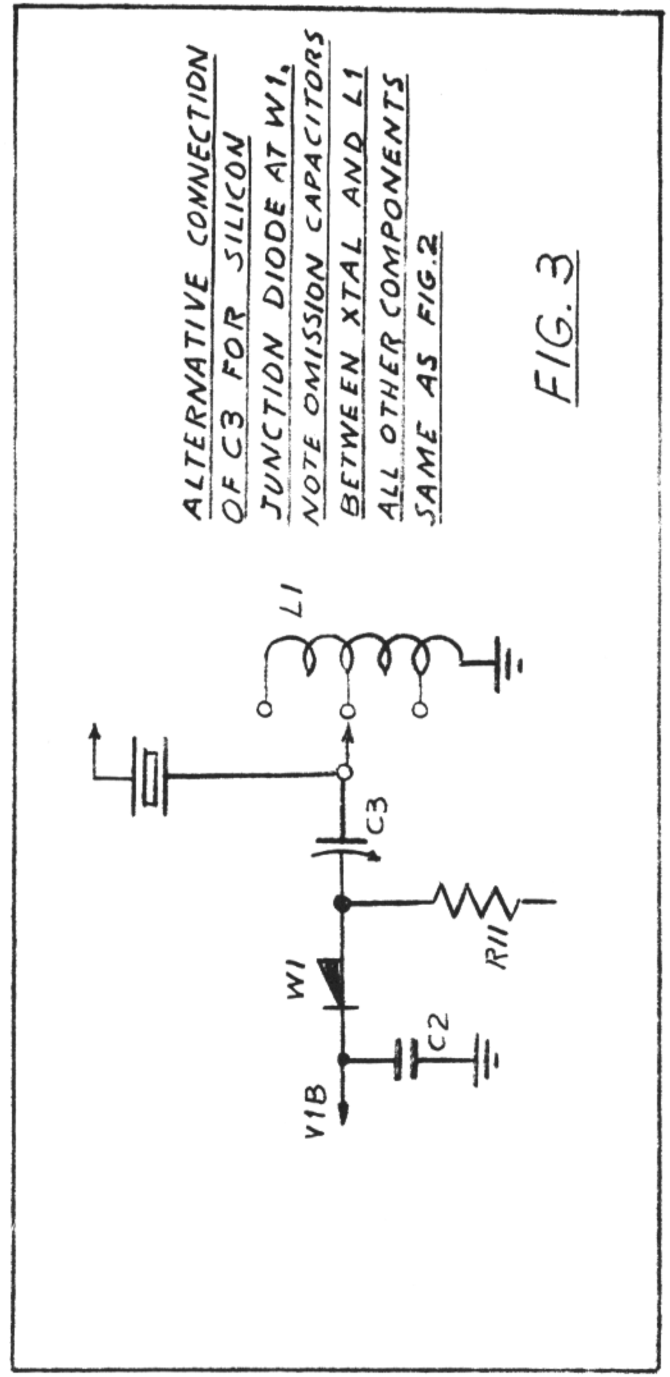

FIG. 3

RTTY - DX

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

In spite of hot weather, vacations, political conventions and various other distractions DX continued at a fast pace for many of the Stateside gang. At this writing all six continents are presently represented by active RTTY hams. Dick, W7LPM, reports that the gear he shipped to Hong Kong finally arrived and VS6AZ is now operating two-way RTTY. Dick has managed several solid QSO's with VS6AZ and says the best time to look for him is around 1500 GMT on 2Ø meters. While on the subject of Asian DX, it should be of interest that several of the gang report real fine FSK contacts with HL9KT around 14,095 KCs. HL9KT has a beautiful RTTY signal into the States and as an added incentive—he has been sending airmail confirmations within a couple of days after the contacts. This latter feature should appeal to those of you who have sore knees from praying for QSL cards from some of those hard-to-work spots around the world. (Incidentally, your DX editor falls into this last classification! !) Speaking of QSL cards: To all of you who wrote this department asking for info concerning the QSL situation from OA5G I have nothing to report. To the best of my knowledge his QTH in the current call book is correct so all I can suggest is patience—and keep your fingers crossed. At least three of the Stateside group mentioned that all they need for their WAC-RTTY award is a confirmation from South America. To relieve this problem W6AEE reports that there are several active Venzuelean stations operating around 14,100 Kcs. As a matter of record several of the DX stalwarts in this area are proudly displaying QSL cards from YV5AFA received by airmail several days after their contacts with him. YV5AFA is Joe Sanchez and he puts in a king size FSK signal here on the West Coast. Joe should be a real good bet for those of you who still need South America to complete your award.

The Pacific gang continue a steady stream of contacts — week in and week out. Both Bruce, ZL1WB, and Alec, ZL3HJ, are operating both 14 and 21 Mcs. nearly every day with tremendous signals. Bruce is usually around 14,090 every day about 0300 GMT and about the time he closes down—Alec starts up and usually is around until 0900 if there are any takers. Bill, ZK1BS, continues his daily RTTY operations and now has a real bad case of "DX fever." He has managed several contacts with G3CQE and PAØFB on FSK which is pretty fair mileage no matter how you measure it. Every time ZK1BS reports in he has added another country to his list and by now is really coming up fast on the "Countries worked" list. Eric, VK3KF, is busy making changes in his set-up to accommodate 14 MC. operation in addition to his regular 21 MC activity. While he patiently waited for his printer to arrive from the States, Eric redesigned his TU and reports it appears to do a great job of copying the W stations. In furnishing VK3KF with a fine printer, W6NRM and his Cohorts have certainly done all DX-minded TTY hams a tremendous service ! ! In addition to W6NRM those hams involved in this effort were W6VPC, W6AEE, WØNMH-KR6AK, W6CQI, W6OWP, KL7AUV and W6YJG.

Good old reliable G3CQE came thru as usual with a letter full of news concerning activity on the European side of RTTY. Bill reports that G3FHL, G3NES, G2UK, and G3DDK are presently active on RTTY. In addition Bill says that EI6W and GW2FUD have all the necessary gear and should be FSK'ing very soon. Also from Bill comes the word that his friend Gerry, MP4BBL, has become smitten with the RTTY fever and has arranged for an FSK set-up on his return to Bahrein in September ! ! This one should really cause a panic on the RTTY frequencies when he shows up ! ! G3CQE has been keeping skeds with ZK1BS and W6TPJ on 14 MCs. whenever the band is open. On occasion Jan. PAØFB has also joined in these skeds with some success.

Three days after he had completed a very successful two-way RTTY contact with G3-CQE, Jerry - W6TPJ received a complete copy of his transmissions from OZ9DR. This, to our knowledge, is the first known activity from Denmark. Ib, OZ9DR, told Jerry that at present he has a complete receiving set-up but is not able to transmit. He has an SX-101 receiver and a Siemens Tape-writer. Ib reports that he does his operating on 14 MCs. from OZ5EL and expects to be active on RTTY from his own station in the very near future.

Finally got some news from my far North correspondent. Nick, KL7MZ says that activity from the 49th State on RTTY has dropped off to just a dribble. Nick says that Jack, KL7BK, is leaving Anchorage to take a teaching job at Oklahoma A. & M. and that KL7AUV is busy trying to garner some new ones on 50Mcs. However, Nick says to tell all his old friends that he and Geri will be back on the RTTY kick by the middle of September. Don't forget—as far as RTTY-DX is concerned — KL7 is still counted as a separate country. (Same goes for KH6).

That's all for now and thanks to W6YJG, W6ZQ, ZS6CR, W7PHO, W7LPM, W6-TPJ, W6NRM, G3CQE, ZK1BS, and W6-AEE for helping me out in the scuttle-butt department. BCNU next month—keep your powder dry. 73 Bud W6CG

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

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For Information Regarding the Society Contact the Following:

W6AEE — Merrill Swan
W6SCQ — Lewis Rogerson

For Traffic Net Information.
W6FLW W6IZJ

For "RTTY" Information:
W6DEO W6CG W6AEE

Re "TERMINAL UNITS"

(May, 1960)

As mentioned in the last two contacts with you, it appeared to me that the terminal unit article cooked up by Herbert Hoover, Jr. and yourself could easily turn into one of the outstanding devices of the year.

Enclosed is copy while using this terminal unit. As you can see, it is very good and, although conditions were not optimum, gave very fine copy.

In running through the operation of the terminal unit, I used the original Gates arrangement that was discussed in the August and September, 1956 RTTY magazine. In the meantime, the terminal unit had had considerable revisions. The main thing was that a bias arrangement was added and the printer magnets taken out of the cathode circuit so that voltage kicks in the coils did not destroy the pulse shape. I had been working with the DC restorer (clamper) for sometime as the value of the pulse on long-period pulses deteriorated very badly. It looked to me as if a change to the AN/-FGC-1 type of unit would alleviate a greater number of problems. Then, the article on the terminal units came out. From this point, I would like to throw in a few extra thoughts.

In the original unit, as described in RTTY, August, 1956, the feed to the terminal unit came from a 500 ohm output connection on the 75-A4 receiver. In case other receivers are used, a matching transformer will help. After the receiver, the proper control relays were installed; then, a band pass filter to get rid of extraneous noises. After the filter, the signal line was fed into the terminal unit to two halves of a 6SL7 with the grids strapped together. As you can see from the enclosed circuit diagram, there is a volume control before this tube.

No limiters were incorporated in the terminal unit as the 75-A4 had "fair" limiters available.

After the 6SL7, two capacity-coupled filters were used feeding into two tubes in parallel. The first tube is a 6SL7 which is used as a driver tube to give the normal crossed pattern tuning indication on the scope. The other tube connected to this same point is a 6SN7 used as driver for the two transformers operating the diode rectifiers.

If you will recall, RTTY's original article had a 1:1 transformer with a bridge rectifier. The same impedance can be reached if we use a 1:2 transformer with a full-wave rectifier. The pulse shape is maintained, the impedance looking from the tube outward is the same, the voltage developed is the same. Since the cost of the transformer is approximately the same, and if you are purchasing rectifiers as in my case, this reduces the number of rectifiers required from 4 to 2. Also, please note that a rectifier with a high inverse rating is used and one that has low capacitance. I believe that we discussed the problem of rectifiers with insufficient peak inverse and the errors that would occur if unsatisfactory rectifiers were used. One other point that we did not discuss was a rectifier having a high internal capacity. If you refer to Figure 5 in the attached sheet, you will see two rectifiers connected back-to-back. From the points A and A′ you can measure at either audio frequency or RF the capacity of this device by resonating it with a coil in a Q meter. Some types of selinium rectifiers, even in smaller sizes, run as much as 100-200 uuf per unit. These units cannot be used as rectifiers in an audio circuit as they load the circuit too heavily, nor can they be used as diodes for shifting the frequency in an RF unit. Usually the internal capacity of this type of rectifier is much higher than even the shift condenser that is employed.

Continuing with our discussion of the terminal unit proper, the output of the detector as shown on my Figure 1 appears very similar to the wave drawn in Figure 4. These figures are copies of the wave shape taken from a DC coupled scope across a 100 ohm resistor in series with the current loop. You will note in Figure 3 the tremendous falloff of the long-period pulse. This was taken with the original Gates type terminal unit and with polar relays in the cathode of the keyer tube. Figure 4 was taken from a series resistor in series with the polar relays connected to the terminal unit plate circuit from Terminals Nos. 8 and

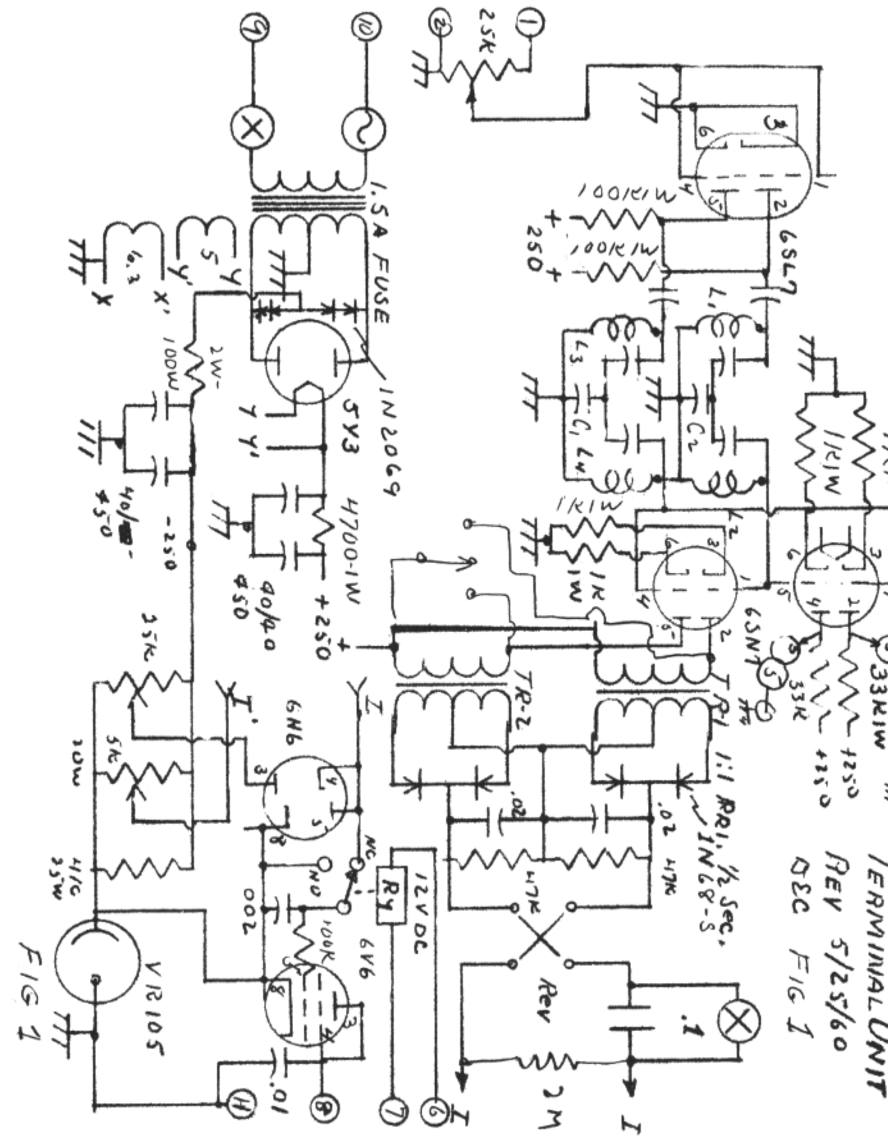

FIG 1

11 in the schematic.

Referring to Figures 3 and 4 you can immediately understand the reason for the improved performance in the terminal unit.

Following the detector which gives a beautifully shaped voltage, with practically no distortion, is a 6Y6 keyer tube and a DC restorer arrangement consisting of a 6H6 double diode and a .1 uf condenser. By switching these units into the circuit, it is possible, by adjusting the 25,000 ohm pot, to double clamp the incoming signal and print on a single tone in very good condition. In fact if the clamping is set right, the unit is extremely free from noise.

One last comment is of extreme importance. As you know, in my operation I use a number of polar relays in series for keying different transmitters, audio shift gears, teletype machines operating in different current loops. Since most of the keyboards are in series with the plate-screen grid current loop, if the screen grid is tied directly to +B and the plate circuit interrupted, the control grid circuit has a very heavy current flowing and floats up and down. This can be cured by moving the screen grid from +B to the plate connection. It is shown this way in Figure 1. In addition, a 12 volt DC relay is used so that when the transmitter is on the line current through the 6V6 is the normal 30 millis. Under receiving conditions, if no signal is received by the input of the terminal unit and the relay is connected to the normally closed contacts as shown in the diagram, then the plate current (loop) is approximately 15 millis., dropping and increasing as the mark and space tones occur.

Apparently a very good compromise of noise pulse elimination has been reached in the ratio of the diode load resistors (47K) and the .02 filter condensers because it is noticeable that under conditions of extreme hiss and low signal strength the polars relays do not chatter as they do in some other terminal units.

As a final comment, the two channels in this terminal unit are balanced by adjusting C1 and C2 in the filters as these condensers control the gain. Possibly at a later date it will be wise to install separate gain controls for the two channels. Your emphasis on adjusting the channel gain cannot be too great. In the reference terminal unit article by Mr. Hoover a very great amount of attention was given to the balancing of a mark and space channel gains. At the risk of being monotonous, this is the real secret of a terminal unit that will operate satisfactorily.

In conclusion, I would like to say that I thought that the article by Mr. Hoover was extremely well-written, that the criteria as set out in the article were very important, and that the final result was so outstanding as to be worth considerable additional comment.

Again thanks for the pleasant visit, and I hope we can get together in the near future. Watch for me on 20 meters as your signal is very good and copies nicely.

Yours truly,
D. E. Chapman
Director, Midwestern Engr. Div.
TELECHROME MFG.
CORPORATION
(W9DPY)

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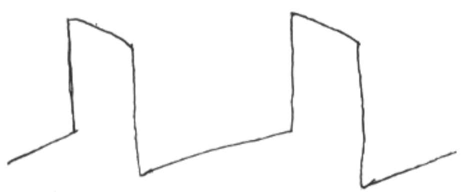


FIG. 3

FIG. 4

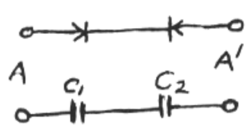
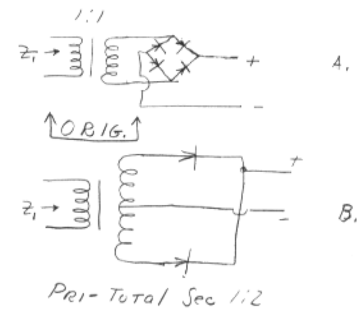


FIG. 5



NEWS ....

My copy is circulated among the Livingston RTTY group, as is Ed Hitchcock's, WA2CBX. Currently active in the 2 meter net are:

Bob Mendleson W2OKO
Ed Hitchcock WA2CBX
Walt Robinson W2NRQ
Gus Schnetzer W2ICA
John Stockwell W2IGX
Bob Stoeber K2DOH
Dick Wells W2ORX
Ken Hopper K2VM

and soon to be on in the area, although not all LARC:

Paul Boivin K2SKK (ex-W1ZXA)
Ed Corey W2SEY
Randy Long W2IHD
John Schrage W2WKL

We are on about every evening, 146,290 kc AM AFSK, horizontal polarization. Most fellows have auto-start and some of us (Ed and I) have tape gear. Bob, W2OKO, acts as the traffic outlet on 80.

Incidentally, we sent ARRL out net information well before the closing of the net directory, but were never listed. In fact I only could find one RTTY listing, in Vermont I believe. Wonder if you fellows requested listing also.

73 es all the best,
Ken, K2VAM

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Stations worked on radio teletype from W1ZXA - Rhode Island, April 1957 through March 196Ø:

W1ASZ, W1AW, W1BDI, W1BGW, WQ-EFF, W1FGL, WQGNS, W1IYU, W1LFI, WQMB, W1OUG, WQRBF, W1RMH, WQ-WEW, W2ATQ, WWAWL, W2GWL, K2-HHH, W2JAV, WWJTP, W2KDW, W2-LRW, W2OKO, W2ORX, W2PAT, W2PE, W2RTW, W2RUI, W2IKO, K2USA, K2-UZS, W2VMN, W3CRO, W3CRO, W3-MHD, W3PYW, W4EHU, W4HKB, W4-JUQ, K4RRG, W4RRG, W4ZJU, W5YM, W6CQK/2, W8BL, W8IJV, W8LEX, W8-LN, W8NIY, W8SDZ, W8UEV, K9BRL, W9DJE, K9DJE, K9JKL, W9LIS, K9POU, W9TCJ, WOVMG, KØASR, WØBP, WØ-KXB, WØØQPP, VE2ATC.

61 stations in all—worked on 362Ø and 714Ø KC only (8Ø and 4Ø).

Above is the record of all stations worked on radio teletype from Rhode Island. W1-ZXA was closed down permanently on March 19, 196Ø, and no other station is known to be active on RTTY from that state. According to our records, all of the above stations have been sent QSL cards. The majority have returned the courtesy, and same cards are now on display at K2SKK. If any of the above would like to send in a QSL in reply, please do so at following address:

Paul B. Boivin, Jr. K2SKK (EX - W1ZXA)
319 So. Orange Avenue,
Livingston, New Jersey

No mail should be sent to the old R. I. address.

Sincere thanks go to all sixty-one fellows who provided W1ZXA with many pleasurable hours of on the air RTTY on those hectic weekend trips "home" to R. I. from New Jersey. All RTTY gear has now been transferred to K2SKK in Livingston, N. J., where once again, we look forward to working all 61 and more all over again! 73,

DE K2SKK Livingston, New Jersey
July 23, 196Ø

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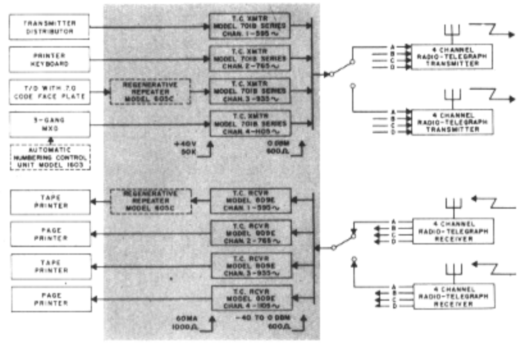
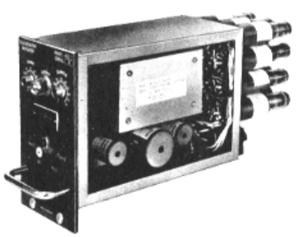
ENCAPSOR TONE CHANNEL SYSTEMS



Model 605C Regenerative Repeater

One of a line of Regenerators built for the Communications Industry.



FEATURES

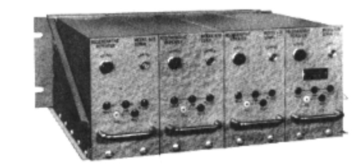
- The Encapsor Products Model 605C Regen is built as a complete PLUG-IN unit—built using plug-in modules to house all circuit components, designed for plugging entire unit into one of four positions on the Model 204A Shelf (Page 4). Frequency Determining Networks for a variety of teletypewriter codes and operating speeds are also plug-in packages.
- Manual control of a sampling pip which is superimposed on the input signal allows the user to shift the selection point for regeneration over 81% of the incoming signal baud length. On a normal 22 msecs baud element, this ranging sample may be shifted better than 18 msecs. Thus, when signals are either light or heavy, a quick adjustment sets up perfect regeneration.
- A variety of input and output strappings (all made on the rear connector of the Model 204A Shelf) provides for maximum flexibility and diversity of operation.
- The output stage of the 605C is designed to deliver 60 ma (through a 1000 ohm loop) to drive teleprinters directly.

GENERAL DESCRIPTION

The accelerated growth of automatic telegraphy, tape-code-printer systems, and data transmission, combined with increased operating speeds, longer transmission lines, time and frequency division multiplexing, multipath radio effects and multibranched relaying and monitoring has resulted in a very definite need for increased tolerance to input distortion at the receiving end of telegraph lines.

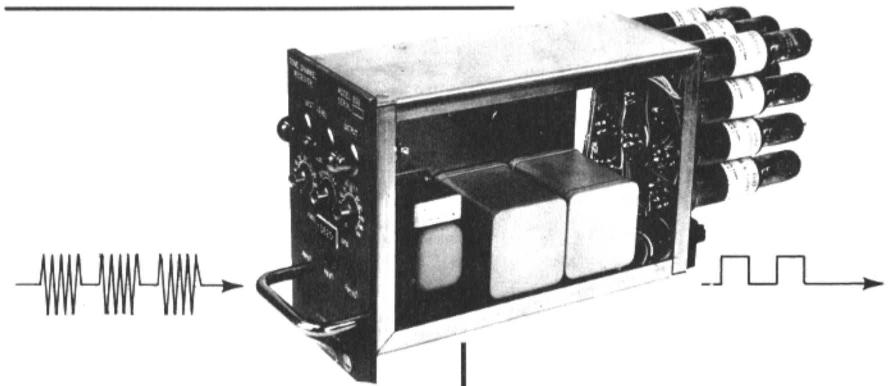
The Model 605C Regenerative Repeater determines the intelligence contained in a five-unit start-stop teleprinter-coded signal which has been distorted by the peculiarities of transmission over telegraph wire and/or radio circuits, reconstructs the wave shape of the signal to its original form, and retransmits the perfectly reformed signal.

By the use of special speed tuning networks (frequency determining networks), the baud length may be adjusted to effect a change in the idle or character rest time. This suggests many uses for this equipment as a timing converter or a relay between two pieces of telegraphic equipment requiring different length of the STOP elements as, for example, between 7.00 code and 7.42 code devices.



For open rack mounting, the Model 450 Shelf mounts 4 Regens. (Here shown fully loaded with Model 678 Regenerators.)

Tone Channel Receiver Model 809



FEATURES

When the Model 809 Receiver is used with external frequency channeling filters—or on the receiving end of single channel transmission lines—no internal filter is required, and accordingly, a dummy plug is provided with unit. When Narrow Band Frequency Channeling is required, a low-speed filter is provided. Similarly, for Wide Band Frequency Channeling, a high-speed filter is provided.

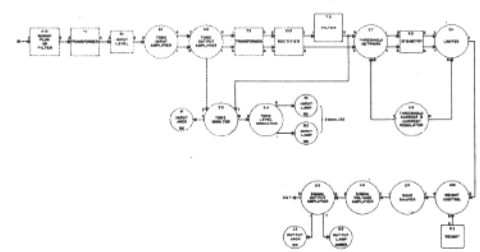
When the 809 unit contains an internal input receiving band pass filter, it may be operated in parallel with other Tone Channel Receivers in a frequency channeling carrier system. Its use in this manner is shown on Drawing AL-B-159 (Page 1).

All circuit components are housed in plug-in modules mounted on rear of chassis.

GENERAL DESCRIPTION

The Model 809 Tone Channel Receiver is designed to accept an ON-OFF keyed tone signal from a 600 ohm radio telegraph receiving circuit and deliver an ON-OFF 60 ma d-c signal to a 1000 ohm teleprinter loop.

The 809 utilizes control circuits similar to those employed in the 701B Series Transmitters, allowing the user to compensate for multipath effect. Two neons (one following the MARK signal, the other the SPACE signal) are balanced by an input level control on the Front Panel. When the intensity of the neons is adjusted to same magnitude, the incoming tone signal MARK-SPACE ratio is balanced.



Functional Block Diagram Tone Channel Receiver Model 809