

Method of Frequency Shift Keying Crystal or Variable Frequency Oscillators

W6ZH — K6EV

A number of schemes have been proposed for frequency shift keying the oscillator of a transmitter operated by teletype. The method outlined below will shift the frequency of either a crystal or VFO with good stability and a wide range of adjustment.

The schematic circuit is shown in Figure 1. A pair of crystal diodes are connected in series with a small condenser C1 across the tank circuit of a variable frequency oscillator (1). If the control voltage Ec is made sufficiently high (above approximately 22 volts in this instance) the diodes will be biased beyond the point where they will rectify any RF. Thus, if the diodes are effectively beyond cut-off, the condenser C1 has no practical effect upon the frequency. As the control voltage Ec is gradually reduced, the diodes will begin to rectify the peaks of the RF appearing across the tank circuit. They will then present a progressively lower resistance from C1 to ground, until finally C1 is effectively in parallel with the tank circuit and the frequency is correspondingly reduced.

The advantage of this circuit, over most of the on-off diode switching schemes, is that a smooth variation of frequency can be obtained over the entire range of the control. The circuit was originally developed as an FM modulator, and excellent NBFM operation on the amateur bands can be obtained by minor changes in the FSK circuit outlined later.

In the circuit shown, the frequency shifting condenser C1 is not critical and a suitable size of fixed condenser can be soldered permanently into the circuit. The variation of frequency is then accomplished entirely in the DC control circuit to the diodes. Condenser C1 should be sufficiently large so that an ample shift can be obtained at the lowest frequency (3.5 mc) that will be transmitted. The control voltage can then be backed off when the output of the oscillator is multiplied for operation to the higher frequency bands.

The circuit can be applied to almost any existing crystal or variable frequency oscillator with a minimum of fuss and bother, and

(Continued on page 2)

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RRTTY



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This page of the Bulletin is for use of amateurs who have teletype equipment for sale or trade and for those looking for equipment to buy or trade. It is a free service and may be the means of getting some one on the air.

- Wanted—Model 12 Keyboard VE2AGF
- Wanted—Model 12 Keyboard W5QDD
- Wanted—Keyboard for Model 26 VE2ANM
- Wanted—Keyboard for Model 12 or 15 VE3AKO
- Wanted—Unshift Lever Bar for Model 12 W6CAP
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METHOD OF FREQUENCY SHIFT KEYING CRYSTAL OR VARIABLE FREQUENCY OSCILLATORS

(Continued from page 1)

with the frequency shift control brought out to a convenient point. One example of this application is outlined in detail below.

A surplus BC-221 type frequency meter makes an ideal VFO for FSK operation. It has excellent frequency stability and is easily calibrated. Figure 2 shows how the circuit is applied. The condensers, diodes and resistors are soldered with short, rigid leads directly to the contacts on the bottom of the oscillator tube socket and to nearby lugs on the chassis.

Type IN38 diodes are used in preference to IN34, as the former have a considerably higher back resistance. The two .005 mfd. condensers C2 and C3 and the 15,000 ohm resistance R2 form a low pass filter to keep keying transients away from the oscillator circuit and to prevent RF from getting into the FSK keying leads.

The voltage divider comprising the 100,000 ohm and 20,000 ohm resistors R3 and R1, between the stabilized 150 volt supply and ground, places approximately 25 volts of positive bias on the diodes. If they are connected into the circuit with their polarity as indicated, they will remain beyond the cut-off condition while the circuit is not being keyed. By taking this precaution the original calibration of the instrument is undisturbed and the over-all stability is improved.

The stability of the oscillator is further improved by connecting the frequency shifting network between the cathode tap and ground, rather than across the whole tank circuit. With a 10 mfd ceramic condenser in this position a smooth and stable frequency shift of several thousand cycles is obtained at the fundamental frequency of the oscillator. The plotted curve of frequency versus control voltage E_c , applied across the 20,000 ohm resistor R1, is shown on the graph in Figure 1. While this curve applies only to the particular oscillator shown in Figure 2, in conjunction with the other circuit constants indicated, it is nevertheless typical of the results that can be expected under similar conditions. In the above instance the range of control voltage that was used for frequency shift keying with teletype was made adjustable between approx-

imately 14 and 20 volts, and the resistance value in the potentiometer circuits were laid out accordingly.

The control circuit shown in Figure 2 is adaptable for direct keying from the contacts on the teletype keyboard. On the other hand, if keying is controlled from the back contacts of a keying relay, which is often desirable, the circuit of Figure 3 should be employed. This arrangement will again place the mark and space frequencies in their proper relationship and provide an equally wide adjustment of the frequency shift. When either of these circuits are applied to other oscillators, some changes may be required in the values of the fixed and variable resistors in order to spread the desired amount of frequency shift over the full range of the potentiometer. The modification to suit individual requirements is not difficult. The Collins type VFO may require a larger condenser C1 than was necessary in the BC-221-Q.

Excellent NBFM operation can be obtained from this circuit. Extreme stability of the oscillator is not so important in NBFM as in FSK, so the 100,000 ohm voltage divider R3 is disconnected, and the diodes are allowed to develop their own biasing voltage across the 20,000 ohm load resistor R1 by rectifying a part of the RF. The change in the control voltage for audio modulation may be obtained conveniently from a cathode follower, as shown in Figure 4. The 20,000 ohm load resistor R1 had previously been chosen so that a self-bias of about 5 volts was obtained. The cathode follower was then adjusted, by means of the deviation control, to swing the control voltage from approximately 10 volts negative to 20 volts positive. A low impedance driving source such as a cathode follower should be used, as the diodes present a non-linear impedance, particularly toward the negative end of the curve. A frequency deviation of 2.5 kcs each side of the carrier could be obtained with audio modulation of the BC-221-Q at 3.5 mcs. For greater amounts of deviation the condenser C1 should be made correspondingly larger.

The frequency shift circuit shown here has many applications besides those already outlined. It has the advantage of simplicity, economy and ease of adjustment without materially affecting the inherent stability of the oscillator to which it is applied.

(1) See U. S. Patent Nos. 2,559,023 and 2,588,551 for a more comprehensive explanation of the circuit.

CIRCUIT DIAGRAMS OF FSK KEYING CRYSTAL OR VFO

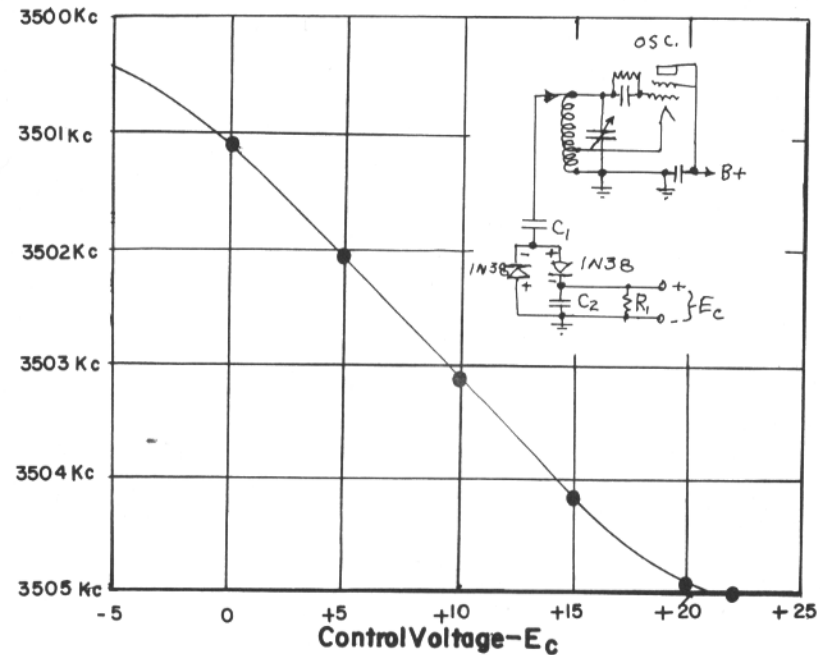


FIGURE 1—The Schematic Diagram of the Frequency Shift Circuit is shown as applied to a Variable Frequency Oscillator. The curve of frequency versus control voltage E_c applied across the load resistor R1 was obtained after modifying a BC-221-Q Frequency Meter as shown in Figure 2.

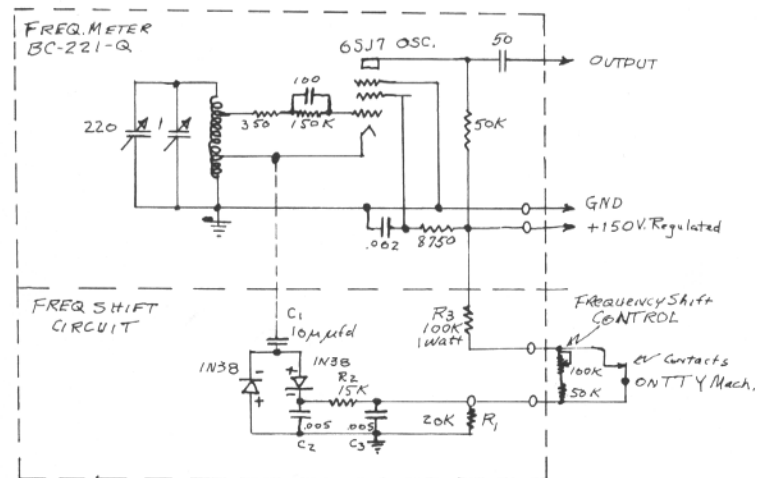


FIGURE 2—Frequency Meter BC-221-Q modified for Frequency Shift Keying. Added parts should be mounted directly on the oscillator tube socket. Connections shown are for direct keying by teletype keyboard contacts (normally closed). (More Diagrams on Next Page)

CIRCUIT DIAGRAMS OF FSK KEYING CRYSTAL OR VFO (Continued)

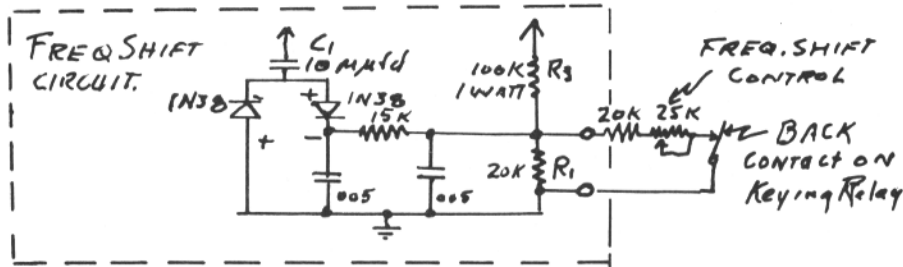


FIGURE 3—Alternative connections for keying by back contacts on keying relay (normally open).

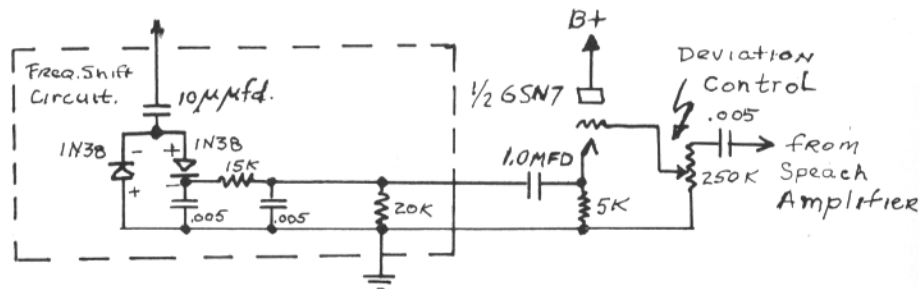


FIGURE 4—NBFM Modification of Frequency Shift Keying Circuit, using a cathode follower as a driver.

Regular Meeting of the Southern California Radio Teletype Society

The March 21 meeting was held at the home of Lewis Rogerson, W6SCQ in San Gabriel. The meeting was called to order by Ed Simmons, W6CLW, who acted as General Chairman. Twenty seven members were present.

Lewis Rogerson again acted as host and to relieve a little of his work appointed Bert Ayers, W6CL to act as Secretary for the evening.

The first item of business was tackled by Emile Duval, W6FLW, Chairman of the Traffic Net. Emile reviewed the past two months activities of the Traffic Net and came up with some very fine suggestions for future Net gatherings.

It was agreed by all members that the frequency 147.85 be left clear for the Traffic Net exclusively on Tuesday evenings from 8:00 p. m. until the close

of the Net. Also Emile appointed Net Control Stations for the next five weeks.

Merrill Swan, W6AEE read several important letters that were received by him pertaining to low frequency FSK operations.

A discussion was held on proposed calling frequencies and the following was suggested:

3760 kcs—7090 kcs—14125 kcs.

W6BWQ read a letter pertaining to Amateur Call Letters for License Plates in the State of California and it was suggested that letters be forwarded to State Senators with your comments on this matter.

Ted Swift, W6CMQ also read some letters received by him from various

(Continued on Page 12)

"Little Gems" from Electronic Surplus

SMALL FILTER CHOKES EMINENTLY SUITABLE FOR USE AS MARK OR SPACE AUDIO TUNED ELEMENTS

By ROBERT H. WEITBRECHT, W6NRM/W9TCJ

Mail Address: Yerkes Observatory
Williams Bay, Wisconsin

The purpose of this note is to introduce to the RTTY fraternity a certain item discovered at International Radio and Television Co., Fairfax Avenue, Hollywood, California. This is a small filter choke, marked #7737, having a nominal value of 5 henries, a current rating of 15 milliamperes, and a dc resistance of 350 ohms. Price 15 cents each. A lot of these have been purchased by RTTY and are available at cost, plus postage. No. C.O.D.'s.

It has been determined that these chokes, suitably modified, function very well for handling audio mark and space tones in various circuit arrangements. Their "Q" appears to be excellent, for the frequencies concerned, considering the cost and materials used.

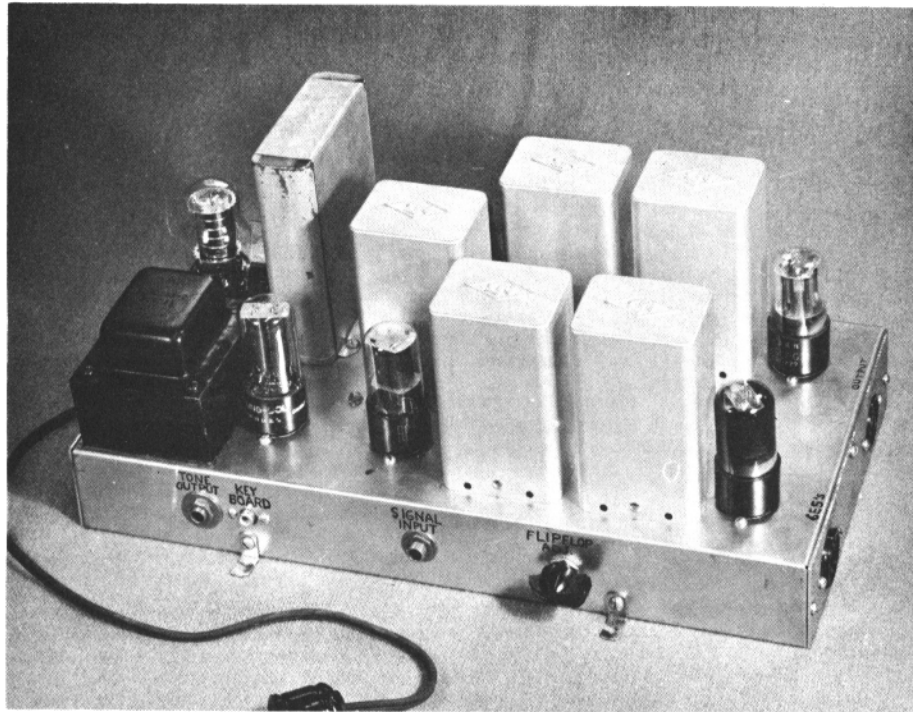
The modification required is simply to remove the frame and I laminations from each choke assembly. The remaining parts, consisting of the coil on its E laminations, is mounted on a piece of bakelite or in various ways. Shown in the accompanying photograph is a double tuned audio filter, typical of units in use at W6NRM/W9TCJ. The capacitors required to tune the inductances to the 2125 cps and 2975 cps tones are 0.01 mfd and 0.005 mfd, respectively. The filter is easily and exactly tuned by sliding the coils out a bit on their E laminations. Thus it is not necessary to critically tune the capacitors for exact tuning. The response characteristic can be broadened, if desired, by slight over-coupling and/or stagger tuning. The "Q" characteristic of such double-tuned filter is such that when it is tuned for, say, mark, the response falls to about 1/20 when the input frequency is set to space frequency. Again, in the circuit to be immediately described, each filter has a voltage gain of about 5 from input to output. Also, the filter can be made into a band-pass type by tuning one coil to 2125 cps and the other coil to 2975 cps, thus giving a double humped bandpass characteristic at beyond and below the extremes of the pass-band.

The circuit diagram of Figure 1 shows the AFSK converter currently in use at W6NRM/W9TCJ. This circuit limits on an input signal voltage of 0.03 volts RMS or over, into the 600 ohm input. The output mark or space voltage from the 6H6 rectifier system is 170 volts DC and can be applied to the usual polar relay driver circuit or to a flip flop, as is used here. The circuit, together with the tone-oscillator of Figure 2, are shown simply to illustrate the arrangement of the various tuned elements. There are, as will be apparent to the intelligent reader, many other possible circuits in which these versatile choke coils can be used.

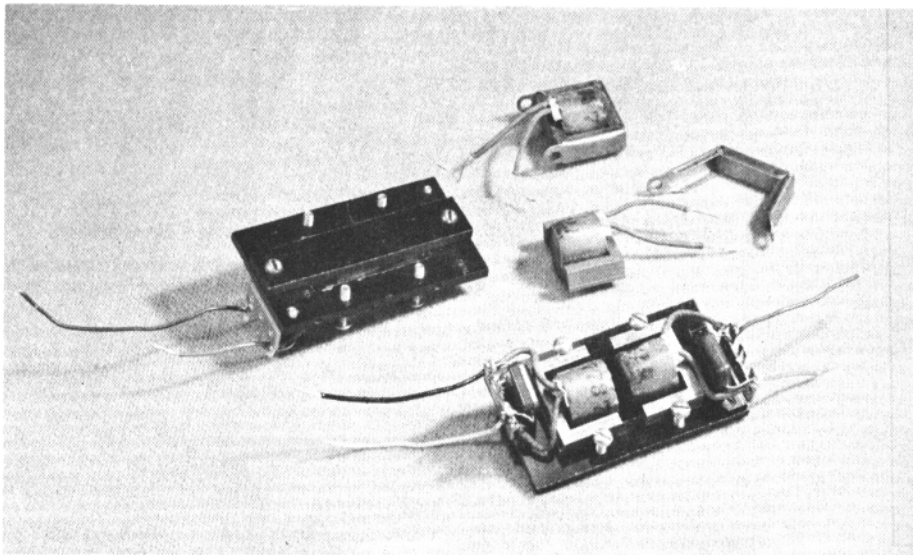
The circuit of Figure 1 represents what may be properly called a FM detector system, consisting of a limiter-discriminator combination. The band pass filter in the input circuit, backed up by any selectivity that the receiver may have, represents an approach towards the overall selectivity of the receiving system. Further selectivity can be instilled into the circuit shown, simply by cascading double tuned filters and cathode followers before the limiter. However, for the most selectivity possible, there must be no limiting effect in the selective filters before the limiter itself. The cheapness and availability of choke #7737 should make this possible and is being investigated as a means towards a broad or sharp RTTY audio filter system, selectable by a switch.

The above mentioned chokes also function efficiently as solenoids and thus could be employed to convert keyboard perforators into reperforators. The I laminations are hinged at one end and mounted in such a manner for the whole solenoid to function as such. Again, a pair of chokes, with I laminations remove, placed together functions well as a 1 to 1 isolation transformer for operation on 110 volt ac line for low current applications.

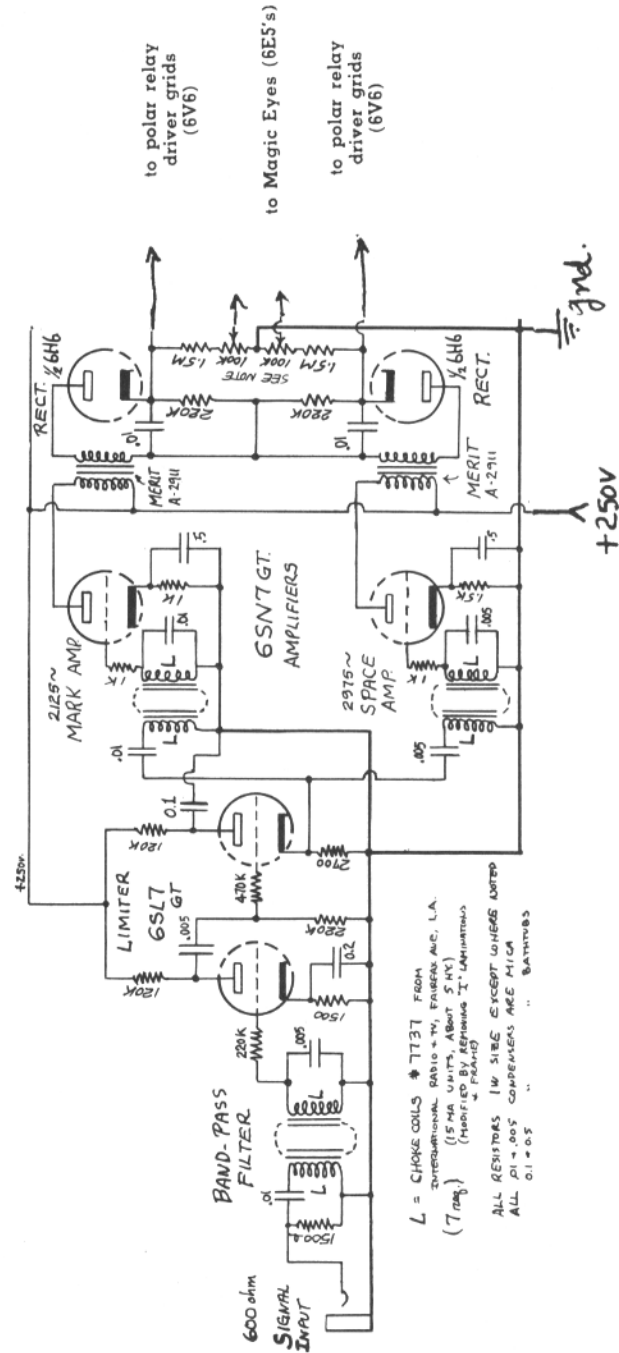
The circuit diagrams and photos of the W6NRM/W9TCJ Terminal Unit are shown on the following pages 6, 7, 8, 9 and 10.



AFSK CONVERTER IN USE AT W6NRM/W9TCJ March 1953



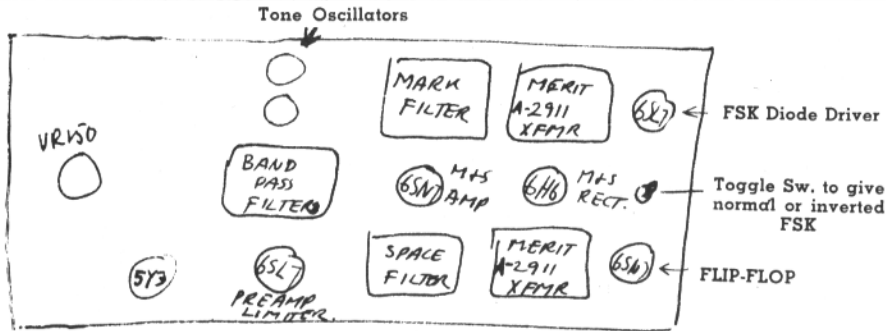
Arrangement of a typical double tuned AFSK Filter at W6NRM/W9TCJ



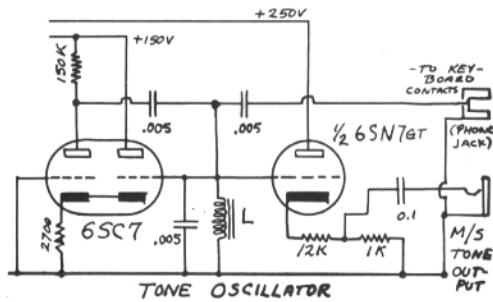
- 1-6SL7 PREAMP-LIMITER
- 1-6SN7GT M/S AMPLIFIERS
- 1-6B6 RECTIFIERS

L-CHOKE COILS # 7737

FIGURE 1-AFSK CONVERTER

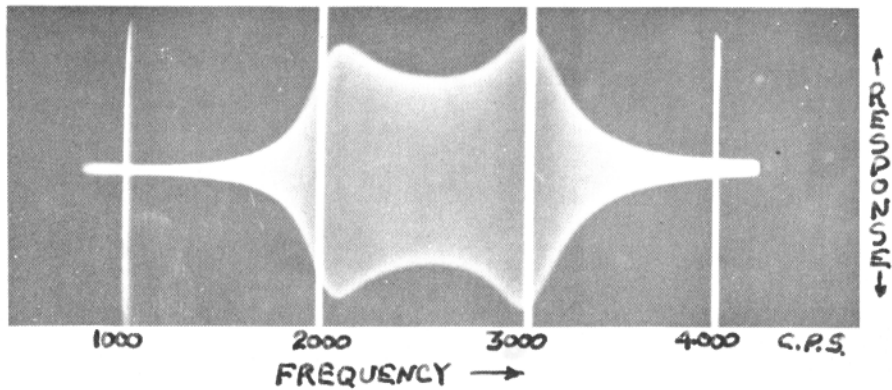


The filters and two audio transformers (Merit A2911) are installed inside National type "RO" coil shield cans



- 1—65C7 Two-Terminal Oscillator
- 1/2—6SN7 (or 6J5) Output C. F.
- L—Choke Coil #7737

FIGURE 2—TONE OSCILLATOR

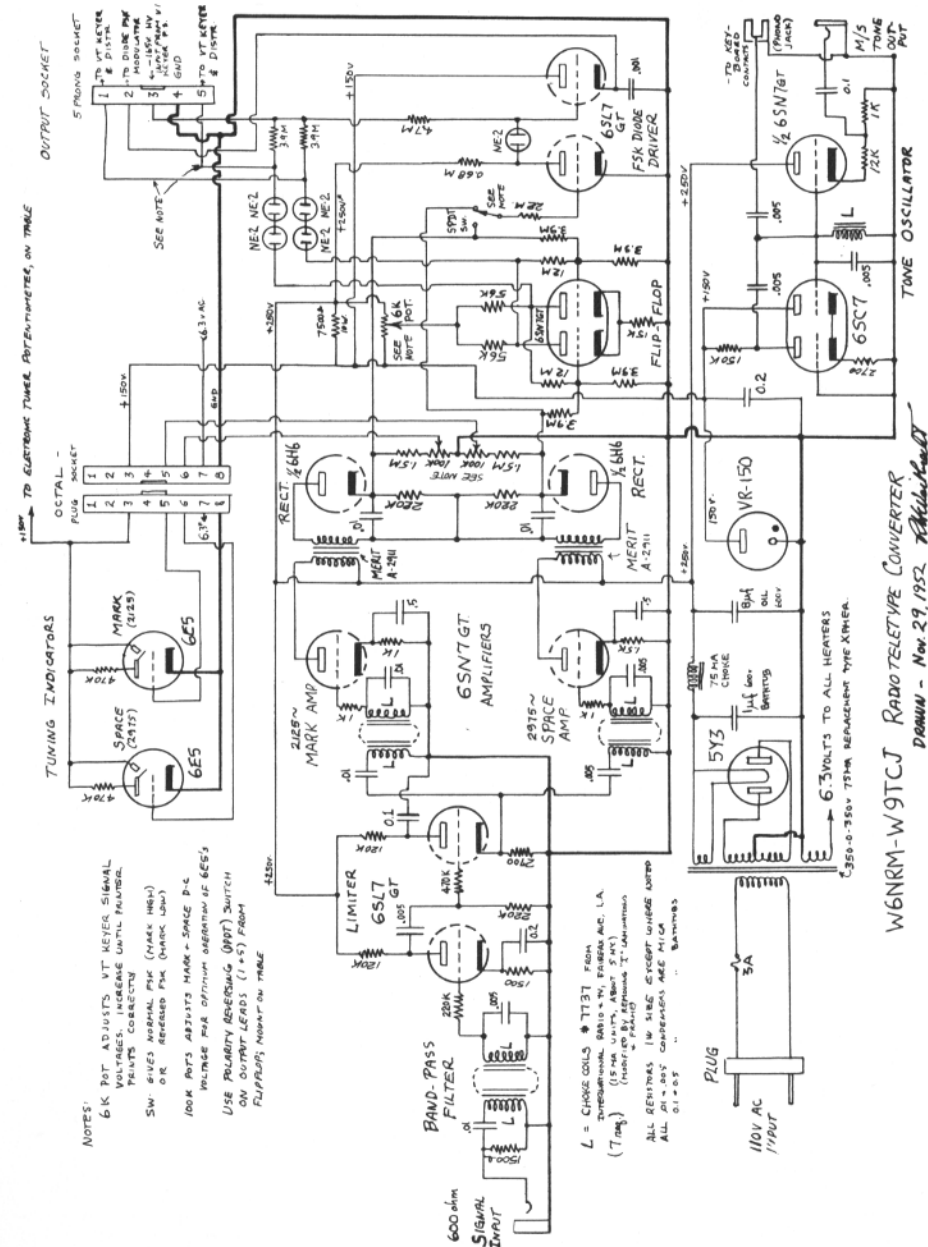


BANDPASS FILTER RESPONSE (WITH Q-Ser)

W6NRM/W9TCJ T.U.

12/52

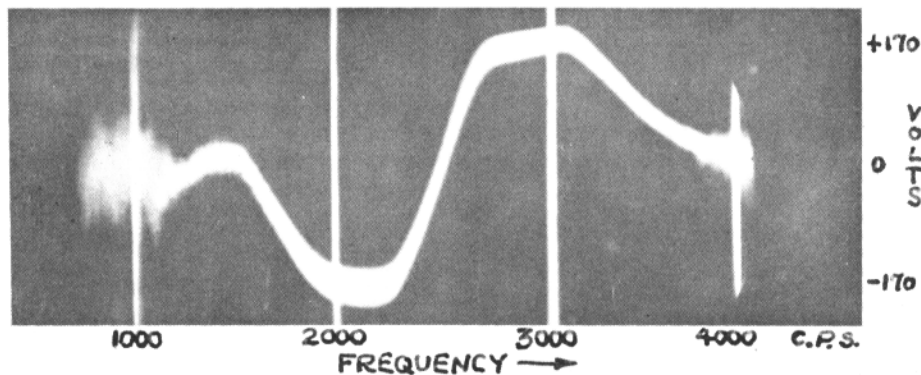
COMPLETE CIRCUIT DIAGRAM OF CONVERTER



NOTES:
 6K POT. ADJUSTS VT KEYS SIGNAL REVERSE AND LINE NUMBER PLATE CORRECTLY
 SW. SEES NORMAL PK (MARK HES.) OR R. REVERSED PK (MARK LOW)
 100K POT. ADJUSTS MARK-SPACE P-C W/PLATE PWR. OPTIMUM OPERATION IF SEES USE POLARITY REVERSING (PRT) SWITCH ON OUTPUT LEADS (1+5) FROM FLIP-FLOP; NORMAL ON TABLE

L = CHOKE COILS # 7737 FROM INTERNATIONAL RADIO CO. PULSED AC. L.A. (7 INCH) (PULSED BY KEYBOARD T. UNIT)
 ALL RESISTORS 1/2 W. UNLESS OTHERWISE NOTED
 ALL CAPS. 50V UNLESS OTHERWISE NOTED
 ALL DIODES 50V UNLESS OTHERWISE NOTED

W6NRM-W9TCJ RADIO TELETYPE CONVERTER
 DRAWN - Nov. 29, 1952. *Richard*



DISCRIMINATOR CHARACTERISTIC

W6NRM/W9TCJ T.U.

12/52

INFORMATION BULLETINS

Bulletins of General Information and Society Activities are sent out on the two meter Channel by Ed Simmons, W6CLW, periodically. Ed has on tape the complete list of members of the Society; the active two meter station list; the Southern California Station List and pertinent FCC regulations. Anyone desiring a copy of any of these bulletins merely has to ask Ed for any one or all of them and he will gladly transmit the tape. The lists are kept right up to date and at any time a change takes place Ed transmits in bulletin form. This is a big help to amateur teletype stations and Ed is to be commended on this fine spirit.

CORRECTIONS

RTTY regrets the errors which slipped into the Station list of last month.

W2NSD was reported as W2NSG.

W4JCV was reported as W4ACV.

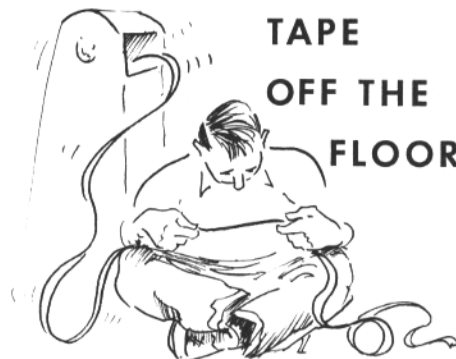
Sorry fellows! Will try to be more careful in the future.

NEW TELETYPE TO REPLACE PRESENT MODELS

Production of Teletype Corporation's new Model 28 Printers, which are being set up in Naval installations throughout the United States is increasing rapidly, according to a Company report. The new model is expected to replace eventually the widely used Model 14 and 15 lines.

The Model 28, the Company claims, is designed for many new services and provides for increased speeds and a larger capacity for special jobs than any apparatus produced in the history of Printing Telegraph. It is suitable for use both in commercial and military fields, and can be operated in business offices, trucks, airplane or other modes of transportation. It may be even carried about by an individual and operated outdoors, the Company states.

Do you have any Teletype Gear to SELL or TRADE? HORSE TRADES on Page 20 is available to all for free. Let's use it!



In the first issue we reported Shorty as loosing the "T" from his machine! (This is getting to be a standard line!) Again we have some news to report on this situation. A kind hearted brother amateur from the middle west read of Shorty's plight and forwarded five "T" units for Shorty to weld on. This was appreciated but Shorty has the "T" bar all fixed up—thanks anyway fellow.

... OK on the last part very good but miss some in the middle. Yes, someday we may have a good traffic circuit and if we do it really could handle the volume. Well Merrill I have to do some work here for about two hours. Will take a look around that frequency for you western boys. W6AEE de WØBP.

Talked to W6NYF the other night and it shouldn't be too long before we have another station on the air.

... He (WØBP) is running 300 watts and hard to copy here tonight, so Merrill with his 70 watts or so must be real weak there. I heard WØBP working W4MOP earlier in the afternoon. Both were fairly good copy then, but now signals are way down. I have terrific BCI here. The BC set on the bench is putting forth with the audio tones plus a lot of hum. W6DEO de W6IZJ.

... Be seeing you one of these evenings. You printed in here remarkably well for your low power. Would appreciate having lots of power there. W6AEE de W9TCJ.

... If you want to we could move down on forty and see if we can copy each other. The Net Frequency 7088 is OK with me. W6FLW de W6NSS.

Yes sir! We have another station on in San Diego—his call, W6RVW and he comes in the Los Angeles area like a ton of bricks on two meters. (When the San Diego stations come in). Well that gives Benny somebody to pound with down south anyway.

... Missed you Bert, Louie came on and took you out. Almost frightened me to death when you came on with that rock crusher Louis. W6CL/W6SCQ de W6EV.

... Fine Merrill and I will be here all evening so come on down, then you can see the little gem I have on the line, and by the way, do you have an extra type bar with the J and Apostrofy as this J gives me the comma, hi. So Ham its your turn, W6EV and the gang de W6SCQ.

W6ILW has his terminal unit under way with the parts mounted and just about ready to wire up.

... Now I say QRX a min—some guys have TVI—but I got BSI (Baby Sitter Interference). This thing is now coming over the speaker I have rigged up from the kids bedroom to the front room! A good S9 sig, will have to look into that! Also I seem to be all thumbs tonight. W6SCQ de W6DEO.

The grapevine reports W6DEO coming up with a Model 15—How lucky some of these guys are—graduating from a Model 12 to a Model 15!

* * * *

. . . . W6SCQ testing with troubles!

* * * *

. . . . I bought an old beat up perforator and fixed it up like new, then bought a tape transmitter and distributor, so I feel set up for a while. I am using a Model 24 Printer which is similar to a 26. I have been on forty and have had a few contacts. On opening night I was all set eighty, I heard boys on but I copied W2NSD, W4OLL and W9TCJ. When I heard the local gang on forty I then rushed out and bought a few coils and got on forty and contacted W9TCJ and W0UVL and W6OWP up north, so I am satisfied considering I am not very active. I forgot to mention that I contacted W7VS in Portland and had a good QSO. W6FLW de W6NSS.

* * * *

W6ZH puts in a beautiful signal all over the Southern California area with his stacked co-axial antenna. Most of the stations are using beams and its rather difficult to copy in a round table unless all stations are directly opposite each other. Maybe a few of us oddly located stations should revert to the co-axial antenna and stop suffering!

* * * *

. . . . I need some NE-96's for use in my Electronic Distributor, and haven't been able to get them. W6FLW de W6IZJ.

* * * *

. . . . and look what we have for the MAY ISSUE . . .

MODEL 21-A ALL - ELECTRONIC DISTRIBUTOR

REGULAR MEETING OF THE SOUTHERN CALIFORNIA RADIO TELETYPE SOCIETY

(Continued from Page 4)

organizations in reference to his fine article on "FSK, The Easy Way."

The Committee on the publication of RTTY reported on their activities and it was suggested by various members that a list of the Committeemen be published each month in the Bulletin.

After the usual consumption of the refreshments Ed Simmons called the meeting to an end.

The following members were present:

W6OQB	W6DEO
W6CAP	W6FLW
W6NYF	W6LGO
W6BAE	W6SCQ
W6WYH	W6GFI
W6TD	W6FNW
W6NJV	W6IZJ
W6NJE	W6BWQ
W6NAT	W6CL
W6AEE	W6TAC
W6ILW	W6EZP
W6VHR	Art Addaway
W6CMQ	Mark Wayman
W6CLW	

The next meeting is tentatively set for Shorty Griggs, W6RL in El Segundo possibly the first part of May. Definite date will be announced over the air by bulletins.

(P. S.—Shorty is planning to make it a combined meeting and barbecue).

For information regarding the Southern California Teletype Society contact any of the following General Committeemen:

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

For Traffic Net Information:

W6FLW—Emile Duval
W6IZJ—Ed Phillips

For "RTTY" Information:

W6CL—Bert F. Ayers
W6DEO—Fletcher Hantke
W6AEE—Merrill Swan
W6CLW—Ed Simmons

SOUTHERN CALIFORNIA RADIO TELETYPE SOCIETY MEMBERSHIP LIST

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R. O. BRAZELTON	W6MRO	3130 Poplar Boulevard	Alhambra
AL BRODY	W6NSS	1962 South Stearns Drive	Los Angeles 34
CHAS. CARINGELLA	W6NJV	223 East J Street	Ontario
WALTER CHAMBERLIN	W6LLP	223 South Catalina Avenue	Pasadena
JEAN H. CLARK	W6TD	19216 San Bernardino Road	Covina
RICHARD CLARK	W6NJE	508 East H Street	Ontario
JIM CHILDRESS		110 Standard Street	El Segundo
BILL DRIML	W6NAT	912 South Montebello Blvd.	Montebello
EMILE A. DUVAL	W6FLW	11420 East Dicky Street	Whittier
ED FOLLMER	W6TAC	408 Manchester Boulevard	Playa Del Ray
DON GOOD	W6EZP	1625 Fletcher Avenue	South Pasadena
SHORTY GRIGGS	W6RL	110 Standard Street	El Segundo
JOHN GROSS	W6NWM	122 Avenue C	Yucaipa
FLETCHER HANTKE	W6DEO	1261 Linda Rosa Avenue	Los Angeles
LESTER HAMMOND	W6EV	5045 La Calandria Way	Los Angeles
C. T. HANNA	W6BAE	15227 South Van Ness Avenue	Gardena
NELSON HANNAWALT	W6LGO	2531 Second Street	La Verne
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ROY LA VIOLETTE	W6NYF	3256 Stoner Avenue	Los Angeles 34
GEORGE D. LOWE	W6IIV	1516 Las Lunas	Pasadena
GEORGE E. MARSHALL	W6VHR	470 South Wetherly Drive	Beverly Hills
ROY MEADOWS	W6GFI	516 West Knoll Drive	Los Angeles
LARRY MEULLER	W6LSG	5413 Passons Blvd.	Pico
W. W. NESTLER	W6QQM	1727 New York Drive	Altadena
CHARLES PATRICK	W6OZE	402 North Lucia	Redondo Beach
JIM PERKINS	W6CYR	1419 South Spruce Street	Santa Ana
ED PHILLIPS	W6IZJ	170 South Michillinda Avenue	Sierra Madre
RALPH POORE	W6OQB	230 West Camino Real	Arcadia
M. R. REYNOLDS	W6PNW	13503 Stanbridge Avenue	Bellflower
JIM C. RIES	W6FNW	332½ East 76th Street	Los Angeles
LEWIS ROGERSON	W6SCQ	5340 North Muscatel Street	San Gabriel
JOHNNY ROTHROCK	W6MYC	69 Mar Vista	Pasadena
CLIFF SCHWANDER	W6KNI	420 South Seventh Street	Alhambra
ED SIMMONS	W6CLW	455 South Oakland Avenue	Pasadena
R. B. STEVENS	W6ILW	1328 East 83rd Street	Los Angeles
MERRILL SWAN	W6AEE	3769 East Green Street	Pasadena
TED SWIFT	W6CMQ	2330 Melville Drive	San Marino
BOB THOMPSON	W6CAP	14867 Wadkins Avenue	Gardena
MARK WAYMAN		511 Ceres Avenue	Fontana
TED WILSON	W6WYH	707 East 84th Street	Los Angeles

Corrections and additions to the above list are solicited. Any member desiring to be listed otherwise than above please indicate the desired mode. Information regarding this list should be transmitted to W6CLW, Pasadena.

Comments from Readers

Ernest Hammer, W6HWW — "You boys did a real nice job on it. Heard W6QOB on RTTY on 7140 working W0BP. Not set to go here yet.

Shorty Griggs, W6RL—Think RTTY is swell. All the best to you.

Frank Azevedo, W6ZNU—I have my order for Model 12 in. I don't know how long I will have to wait. Am building a panel now.

Bob Wertbrecht, W9TCJ—Thanks for RTTY. Fine and competent job. Keep up the good work.

Bill Driml—I enjoy every page. Keep up the good work on RTTY news.

"Ham" Hammond, W6EV. — RTTY was fine this month.

NYS and 2RN Traffic Nets report that FSK RTTY is breaking up their net operations on 3615 and 3690 kcs. The station reporting did not identify the offending station. However the report alleges that the Teletype signal was 4 kc each side of zero beat.

At this stage of Amateur Radio Teletype we should make sure that this type of report, whether correct or not, should be charged to one of us.—Ed

Ted Swift, W6CMQ has been asked to write more articles similar to his "Hints on Receiving FSK Signals," by one of the major Amateur journals.

Don Wallace, W6AM—RTTY is FB and thanks for chance to see it.

Robert Cortes, W1EXZ—Thanks for sample copies of RTTY. The article on the different type of equipment is just what is needed.

Jerry Walker, W7FGG — Received the RTTY Bulletin and found it very interesting. There are two Model 12's in Tucson but both are still AFSK.

John Towse, W3FU — Would appreciate copy of RTTY, just getting started here.

Paul Leslie, W0CIH—In Bulletin 2 you mentioned method of connecting a scope to the Terminal Unit so as to show an X for correct tuning. (Note: May Issue will carry article on this—Ed).

Red Rollins—Will you please put my QTH on your mailing list. Best wishes.

Nicholas Rosa, W1NOA (Amateur Radio Editor Radio and Television News) —Thanks for sending us January and February issues of RTTY. They are very informative and interesting, and very professionally made up. They also demonstrate the good, old-time amateur inventive and pioneering spirit among teletype hams. May your tribe increase.

Had a nice long telephone call from Floyd Colyar, W5QDD in Lordsburg, New Mexico early this month. He reports receiving only due to lack of a keyboard. Floyd has a Model 12 printer and has had very good luck so far. Ask about the terminal units the West Coast gang are using. He also mentioned that he had not been able to locate the BC-733 filters for conversion.

YERKES OBSERVATORY
Williams Bay, Wisconsin
March 9, 1953

Hey, Merle!

A few days ago I sent off to you a manuscript of "Little Gems from Electronic Surplus."

Just struck some extra prints of the band pass and discriminator response curves

Traffic Net News

EMILE DUVAL, W6FLW

The Southern California Radio Teletype Society Net operates every Tuesday evening at 8 p. m. on 147.85 mc.

The Net activities are gaining national recognition and it was suggested by an Eastern station to check into the Net via 40 meter FSK and to be relayed on 2 meters. An attempt will be made to try this in the near future. Arrangements are being completed at this time, and by the next issue of RTTY we should be able to report the results.

An average amount of traffic has been handled on two meters and some of the traffic was relayed to the low frequency stations, but most of the activity has been in the form of Bulletins, which have been in the nature of the new regulations.

Activity for the Month of March:
March 3—W6FLW, NC (Check 9)
March 10—W6QQM, NC (Check 8)
March 17—W6NAT, NC (Check 8)
March 25—W6CL, NC. (Check 10)
March 31—W6DEO, NC (Check 9)

The following stations have been appointed as Net Control for the next five weeks.

April 6—W6GFI
April 14—W6BWQ
April 21—W6AEE
April 28—W6SCQ
May 5—W6AEE

The present schedule of procedure is as follows:

- 1—Roll Call of stations (Do not break in unless called).
- 2—Handling of Traffic.
- 3—Handling of Bulletins.

Stations asked to call other stations report back to Net Control. Do not carry on 2 way communication between stations unless requested to do so by Net Control.

that was run off on the latest T. U. (The circuit of which I sent to you in the manuscript).

Enclosed you find the prints. Thought you might like to see what they look like. You will note the broad response of the discriminator characteristic . . . which aids in the receiver/transmitter drift problem . . . and the band pass response, which aids minimizing QRM. Of course am planning a new input filter using the same 7737 chokes with a different and sharper input selectivity curve than this "rudimentary" bandpass filter has. Select broad or sharp at a flick of the wrist.

Received the third issue of "RTTY," very good. I like the magazine very much. So enclosed find a check to start the new subscription. (1.80).

Was interested in W6NWM's method of getting a tape distributor. As a matter of fact, I used the same method a couple of years ago to accomplish the same end. Only I got the pulse for the magnet right from a simple switch which was closed by the action of the keyboard locking loop. I still have the works in the keyboard, but don't advise using the keyboard transmitting distributor for scanning the tape. Too hard work on that sort of cam. Better use a segmented disc and a couple of rotating brushes, etc.

Have you seen the new Kleinschmidt Model 100-A Teletypewriters? They sure are beautiful creations. I was over to the factory in Deerfield, Illinois and saw all the stuff. They can go up to 160 words per minute with ease, no strain. They are furnished the military services with gears for 60 and 100 words per minute. It looks like that Model 15's may be declared surplus sooner than you think.

Returning to the prints enclosed, you may put them in the article if you wish. It would be interesting, I am sure.

Weather is warming up. Pretty soon we will have the usual summer weather, with lots of rain, sun thunder, lightning, and all the stuff that goes with plains weather.

Sure hope that we will be able to establish a regular sked for exchange stuff. Could you patch me into the local two meter net? Would be fun if I could join in at one of the SCRYS meeting Nets that you hold every Tuesday.

73 de W9TCJ—

(Signed) Bob

News from Canada

VE2AKT, BENNY HALIKMAN"
41 Laviolette Ave.
Outremont 8, Montreal, Que.

March 9th, 1953

Southern California Radio Teletype Society
3769 E. Green St.,
Pasadena 10, Calif., U. S. A.

Gentlemen:

It was indeed a pleasure to receive your RTTY Bulletin for January and February, 1953, and this very afternoon I received your March issue. My enthusiasm was so great that I couldn't wait to drop you fellows a line and with the aid of my XYL here goes!

Firstly, I would like very much to convey and extend my deepest sympathy to your entire group regarding the shocking loss of a Radio Amateur such as Leo Shepard, W6LS. It was indeed a great loss to everyone who knew him and to every RTTY fan. I feel sure that the name of Leo Shepard and the call sign W6LS will long be remembered to all concerned and will certainly go down in the pioneering history and annals of Amateur Radio Teletype.

At this point I will take the opportunity of unofficially appointing myself on the activities of the local group interested in RTTY in Montreal and surrounding districts. I would also like to inform you that I was the first VE2 to make contact with an outside station, W9TCJ. Conditions were very poor at the time and this was not solid, but we did however have a solid QSO with W2JAV. I cannot start telling or trying to describe the thrill and experience as it would take oodles and oodles of paper and I'm sure that most of your group has by now experienced that same thrill of seeing their call come up on the printer.

The following stations are the ones who are at present equipped with RTTY equipment and who are ready for action. VE2? —Lou Buck (The patron saint of Canada as Wayne Green calls him) is with the Canadian Press and has furnished myself and others so far, but equipment is dwindling very fast. By the way, Lou Buck is an ex-VE4 and should have his local call letters any day. VE2AGF, Tom Lott, who is president of the Montreal Radio Amateur Club and quite an Authority on transistors, is with the Northern Electric Co. which is part of Canada's vast telephone System. He has a home-made converter and # 12 machine and needs

(Continued on Page 19)



Left to Right: VE2AKT, Bennie Halickman; VE2AGF, Tommy Lott; VE2???. Lou Buck

Letters from F. E. Handy, ARRL

RTTY received letters from Mr. F. E. Handy of the ARRL regarding certain matters of interest to all Amateur Radio Teletype operators. They are reproduced below—comments from amateur teletype operators should be addressed to Mr. Handy or RTTY.

THE AMERICAN RADIO RELAY LEAGUE
Administrative Headquarters
West Hartford 7 Connecticut, U. S. A.

February 20, 1953

Mr. Merrill Swan, W6AEE

Southern California Radio Teletype Society
3769 East Green St.,
Pasadena, Calif.

Dear Mr. Swan:

Many thanks for sending copies of your excellent official bulletin (RTTY) for January and February. I'm delighted to note that you have had a Net in operation since early January. Perhaps this should be addressed to W6FLW insofar as traffic-net news is concerned, but spot frequency use considerations are a big enough subject to interest everybody. I am attaching one of our Net Registration cards (as well as a Net Directory showing "outside" traffic connections) however, and think you or Emile might like to send it back so you could have the honor of being the first amateur radioteletype network to become "registered." Will you handle, or pass it to Emile, W6FLW if he is the one who should receive it?

I hope no one has a wrong concept about "registration." At the outset in this connection, let me say that a net registration in itself is NOT a guarantee of freedom from interference on any frequency. ARRL Net Registration, or the device of calling and working frequencies is just regarded here as a tool to permit fullest coordination and cooperation between amateur groups. But inclusion in our listings, requires understanding that nothing in regulations or law gives one net, or mode, or individual any legal priority or precedence over another in the use of a frequency. However, establishment of a listing does (for all) assist helpful choice of frequency, or time-of-use of a frequency and give increasing cognizance and stand for a particular operation as time runs along. It helps avoid unnecessary conflicts of interest many times, and can be as valuable for radio-teletype as for c. w. and 'phone.

We have had some correspondence, since just before the end of the year, with

the New York RTTY gang about working and calling frequencies—the subject assuming importance with more operation in prospect in the h. f. bands. Two of their calling frequencies choices were mentioned in an affiliated club bulletin (3620 and 7140 kc.) as tentative choices—but interference from outside the Americas makes 7140 kc. a poor bet. With the hope that FCC will act favorably on a request on file with it to extend 'phone into 14300—14350 kc. ARRL couldn't conscientiously suggest that anyone set up especially for RTTY on 14,340 kc. as they had advanced. I have given some thought to the possibility that initial haphazard frequency choices might build up some unfortunate feeling or conflicts in interest between A-1 and F-1 users and hope such can be minimized or avoided. The best service we can render to all concerned will be I think, to include an RTTY column in our regular QST listing of "National Calling and Emergency Frequencies" such as appeared on page 70, February QST.

Where RTTY work is not in the form of Net operations, there is however, the need for one or more working frequency channels—secondary channels to leave the calling frequency relatively free, whenever there is considerable traffic or back-and-forth communication in prospect. This principle is presently used by numerous c.w. net operators and, on a voluntary basis is generally accepted amateur practice. For example, when calling the roll, NCS often move traffic stations to a designated working frequency to permit matters to call and give traffic lists on the calling, or net, frequency. 'Phone nets do the same to a somewhat lesser degree.

So to give Teletype a National Calling and Emergency Frequency is what I want to propose, assuming you agree in such general principles of use, and if we can arrive at a generally agreed best frequency for the purpose. Nets (and their registration) generally speaking await numbers. In the absence of given net patterns, a working frequency is more highly essential right at the outset, if we are to get our teletype gang best set up to bring glory on themselves by practical use of their equipment in natural

(Continued on Next Page)

disasters or in civil defense emergencies. I feel sure we all want this.

Each band with RTTY privileges (F-1) rates study and I think it practical to carry the matter under study even into the new 21-21.25 F-1 band. Though this may be right now less vital, the more planning for voluntary measures to make our work better can be ahead of operational need the better. In the important lower frequency band consideration the contribution amateur radioteletype might in civil defense amateur radio seems important. You will see from the full net directory, that there are few nets directly in 3.50-3.51 mc. and a working F-1 channel, designated where work could continue (by RACES-authorized amateurs) under a war-time suspension of Part A of our FCC rules would give our teletype gang not only a channel, but the greatest opportunity for continuing recognition and operation. The League has under discussion with governmental people interested in the civil defense problem, which channels of the RACES sector, it would believe best to encourage for the up-building of F-1 capabilities using teletype. More on this when officialdom has clarified some FCDA allocation studies started in Jan. in which they ignored F-1 even though provided for in RACES rules.

No RACES frequencies are presently contemplated in "40" and "20" of course so that important aspect doesn't have to be considered there. From the standpoint of operating economies and precision, it would seem that a degree of frequency doubling (to permit crystal control from the same crystals) might be helpful to RTTY users. On "20" a frequency just below the American and Canadian phone bands would STAY a good investment for a longer number of months or years when setting up teletype here whatever happens. Don't you agree? Summing up all these considerations, and reviewing the known calling frequencies and nets, I would like to suggest consideration of the following for radioteletype voluntary choices of calling and working frequencies. Frequencies up well within the band, avoid unforeseen complications by giving fair consideration to the DX users, nearer the edges of the bands, band-edges that if used immoderately or inconsiderately (F-1) will invite pointed objections and criticism from non-teletyping and DX-minded amateurs.

Calling & Emergency Fcy.	Working Frequency
3620 kc.	(under study 3.5 end)
7070 kc.	7075 kc.
14140 kc.	14150 kc.
21210 kc.	21225 kc.

I'll be interested in your comments, and the sooner the better if we are soon to publicize all or part of such recommendation as part of our customary box-designation of calling and emergency frequencies. 73.

Sincerely yours,

(Signed) F. E. Handy
F. E. Handy, WIBDI

FEH/drs Communications Manager

THE AMERICAN RADIO RELAY LEAGUE
Administrative Headquarters
West Hartford 7 Connecticut, U. S. A.

February 27, 1953

Southern California Radio Teletype Society
Mr. Morrill Swan, W6AEE
3769 East Green St.,
Pasadena, Calif.

Dear Mr. Swan:

This is to supplement my letter of February 20th, about the proposal for some Calling and Working Frequency specifications for RTTY—which we would help make effective by modification of our customary QST monthly listing of National Calling and Emergency Frequencies.

You will be interested to know and pass along to the gang that the Federal Defense Administration (Warning and Communication Division) responsive to our ARRL request to review the provisions for F-1, operational recommendations and include one or more channels suited to work in RACES, has duly deliberated the matter and come up with the following, which would appear to us a good recommendation, and one that adds a practical spot for amateur radio-teletype as well as other modes.

"Regarding providing for frequency shift keying radioteletype operation on the RACES band 3500-3510 kc or 3990-4000 kc, we suggest the following:

"Provide for two channels of teletype operation on the portion of the band 3503-3507 kc, each channel (*see table) to be 2 kc. wide. The four displaced 0.1A1 channels are relocated in the band 3996-4000 kc, replacing the provision made for possible single side-band suppressed carrier voice operation. This will keep radio teletype operation adjacent to CW operation, in a band permitted by Part 12A of the FCC rules. Although the RACES rules permit FSK on 3990-4000 kc and 29.45-29.65 mc, it is thought desirable to operate it in RACES

in the same band as permitted for regular amateur operation."

"Suggested channelization is as follows:

Channel	Assigned Freq.	Emission
1	3500.5	.1A1
2	3501.5	.1A1
3	3502.5	.1A1
4	3504.0	1-1F1
(working)		
*5	3506.0	1-1F1
(calling)		
8	3507.5	.1A1
9	3508.5	.1A1
10	3509.5	.1A1
11	3993.0	6A3
12	3996.5	.1A1
13	3997.5	.1A1
14	3998.5	.1A1
15	3999.5	.1A1

"States to which the original channels 4, 5, 6 and 7 were assigned would get the new channels 12, 13, 14 and 15 respectively. Shared use of the two 1-1F1 appears to be necessary."

May I ask for your early comment on the above, and the table which it supplements, which was on page 3 of my February 20 letter. Thanks and 73.

Sincerely yours,

(Signed) F. E. Handy
F. E. Handy, WIBDI

FEH/drs Communications Manager

PRICE OF BULLETIN SET

Last month carried this notice on page 9. This issue is the LAST one which will be mailed gratis. If it is your desire to continue to receive RTTY, please forward your remittance in the amount of \$1.80. This price covers the mailing cost and bookkeeping only. Operating on this basis, RTTY will need help from readers in furnishing material of general (Teletype) interest. The last four issues have shown the type of Bulletin which we will continue to print.

NEWS FROM CANADA

(Continued from Page 16)

a key-board in the worst way. VE2GL, Gordie Lynn, who is with the Department of Transport and who is actually the first fellow to send back my call letters locally. Gordie is a very good technical man and has been in radio teletype most of his life. An ole-timer and a Gent! VE2TX, Harold Cahoon, who is with Trans-Canada Airlines is a pip when it comes to searching for trouble as he is the maintenance foreman with TCA tele-Communications. He has a #12. Converter is an AN/FGC1 Western Electric. Harold has helped me personally to a great extent and is a real white guy. VE2ANM, Albert Malumed is about the youngest of the group who sports a #26 machine which he scrounged entirely on his own ingenuity. The key-board however, was obtained by Lou Buck from a pal in western Canada. Albert should be on the air in short order. Getting back to Lou Buck, the only one with a #15 machine for miles and miles. He also has the Johnny Williams type converter. Lastly, I am running a pair of #12 machines, one with keyboard, the other filtered for receiving only. Have a #14 perforator, very new, and also a tape transmitter. The adapter is an RCA Single Channel frequency shift adapter CFA46. The exciter is a Sonar VFx680 going to a rig with a pair of 810's. Approximately 700 watts on 40. Receiver is an RCA AR88. Have also obtained original Western Electric power supply for the #12 machine, positively the best. Also have AN/FGC1 Western Electric carrier system rack which I am putting into working order as a stand-by.

Please send the bulletin to Lou Buck, 5890 Souart Ave., Mtl. Lou's M. O. will be in the mail. Please find enclosed my M. O. for the bulletin which I think so far is second to none. Also a photograph of Lou Buck, Tommy Lott and myself and some of the gear we had down to the Montreal Amateur Radio Club meeting. Attending the meeting were approximately 150 hams and guests and the demonstration put on proved enjoyable to all.

That's the works for now. Hope to be sending you more news from Canada as it happens.

Wishing you all best 73's for now and many RTTY contacts, I am,

Sincerely,

VE2AKT, BENNIE HALIKMAN
The All Kosher Transmitter
(Signed) Bennie