



THE T & R

BULLETIN



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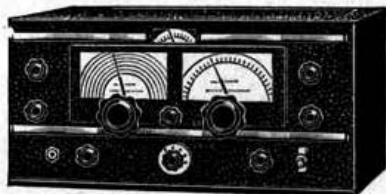
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AND ADVANCEMENT
OF AMATEUR RADIO

Hon. Editor : ARTHUR O. MILNE

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WIDE-BAND FREQUENCY MODULATION

WIDE-BAND frequency modulation, briefly referred to in our January issue, is at the moment exciting considerable interest among U.S.A. amateurs who see in it a possible solution of many difficulties attendant upon ultra-high frequency operation.

Frequency modulation has in the past been neglected, for the reason that to produce intelligible speech, wide side-bands are necessary. For that reason its practical application lies in u.h.f. operation at which part of the spectrum band-widths for specific services can be considered in thousands of kilocycles. Recent experiments conducted by the A.R.R.L. serve to show that a frequency separation of 50 kc/s is sufficient to avoid interference, which on that basis would enable 80 local amateur stations to operate simultaneously between 112 Mc/s and 116 Mc/s, provided they are properly spaced. Experimental work within this band is known to be difficult under present conditions due chiefly to the effects caused by man-made static. By using wide-band frequency modulation it is claimed that electrical interference is practically eliminated. In addition to this advantage it appears that the actual equipment needed is considerably simpler than that required for amplitude modulation, whilst the power necessary for modulation of the carrier is very small, irrespective of the final carrier output.

Modulation can be applied direct to the frequency control stage while all succeeding stages may be operated in any manner desired without regard to amplitude linearity. Audio power amplifiers are unnecessary, since it is possible to obtain adequate frequency swing with a speech amplifier output of only a few volts at practically no power. A frequency modulated transmitter it is estimated takes only one half the equipment required for an amplitude modulated transmitter.

The question of interference between local stations has not been overlooked but in view of the ease with which $2\frac{1}{2}$ metre directional aerials can be erected, it should be possible to overcome this difficulty except perhaps when weak signals arrive from the same direction as those from a stronger station.

It is singularly unfortunate that British amateurs should, for the time being, be debarred from actively collaborating with their U.S.A. friends in the task of putting frequency modulation to a practical test. They will, however, watch with particular interest the outcome of the present experiments which are aimed at determining the applicability of the system to congested-band operation.

J. C.

A TEN WATTS AUDIO FREQUENCY AMPLIFIER

By RAYMOND A. LOVELAND (2ARU)

NOW that transmitting experiments are necessarily curtailed, many amateurs will no doubt turn their attention to non-radiating apparatus. A good general purpose A.F. amplifier is an asset to any station, and the design about to be described will be of special interest to newer members. This amplifier has been in use at the writer's station for nearly two years, and has functioned as modulator, high quantity broadcast, gramophone and public address amplifier. It has proved entirely reliable and satisfactory in every respect.

Circuit Details

There are several interesting points in the circuit, including optional negative feed back, separate controls for treble and bass attenuation, and over ten watts audio output from a single valve.

The amplifier has an overall gain of 125 dB, which is ample for most requirements, no pre-amplifier being required to fully load it from any type of microphone. A high-level input is provided for pick-up and radio input. This is connected in the grid circuit of the second stage and in this case the gain is 88 dB.

The author has not been able to determine the exact frequency response, but with negative feed back applied, the quality on radio and gramophone leaves nothing to be desired.

As will be seen from the circuit diagram Fig. 1, the amplifier comprises four stages with resistance capacity coupling throughout. A 6J7 RF pentode, connected as a triode, is used in the first stage. No volume control is provided in this stage at all, the output from it being controlled by VC1 in the grid circuit of the second stage. One point of minor interest is that the switch, S1, controlling the microphone battery is ganged with VC1, so that when the microphone is turned to minimum volume, the battery is switched off.

A 6F5 high impedance triode is used in the second stage, in a perfectly straightforward circuit arrangement. The coupling between this and the third stage forms the basis of the "bass-cut" control. Referring to Fig. 1, it will be seen that a five position switch, S2, is provided to switch in different values of coupling condenser. The impedance of a condenser varies with frequency and is inversely proportional to capacity. Thus small values will introduce considerable attenuation at very low frequencies, but far less at the higher audio frequencies. A large condenser will not have very much effect at any audible frequency. The condensers C6 to C10 thus provide a means of controlling bass attenuation. It will be observed that one condenser, C6, .25 μ F. is in circuit in all positions of the switch. The first position connects this condenser alone and provides a slight predominance of bass. Position No. 2 puts another .25 μ F. condenser C7 in series with C6. This setting is the one used by the writer for most purposes, but the remaining three steps of bass-cut

can be put to good use on occasions for the clear reproduction of speech on P.A. work. On some broadcast transmissions and recordings the first position, giving a slight bass-boost, can be used to good advantage. The most severe degree of bass-cut attenuates all frequencies below approximately 200 cycles.

The valve used in the third stage is a 6C5 low impedance triode. In this stage the negative feed back circuits are of particular interest. The cathode circuit is made up of a 5,000 ohm and a 500 ohm resistance connected in series, the latter being nearest earth. A proportion of the output is fed back from the output valve anode via R12 and C14 to the junction of the two resistances in the 6C5 cathode circuit. The change-over switch, S3, is arranged so that the negative feed back circuit can be rendered inoperative, when the amplifier will function normally.

The application of negative feed back considerably reduces both frequency and harmonic distortion, but at the same time also reduces the gain of the amplifier, and for the same input, the output is only about four watts. The advantages are that quality is greatly improved and background noise is almost non-existent.

A series of condensers of different values connected across the anode of V3 and earth via another five-way switch, S4, forms the "treble-cut" control. A large value of capacity here produces a low impedance shunt which will attenuate high frequencies much more than the low, the amount of attenuation being dependent on the size of the condenser. In the first position of the switch no capacity is in circuit, therefore maximum high note response is obtained. The remaining four positions give varying degrees of "top-cut," the most severe, cutting off at about 3,000 cycles.

The coupling condenser C18 between V3 anode and the output valve grid is of the oil-immersed type. The very high insulation resistance of this type of condenser makes it specially suitable for this position.

The output valve is a 6L6, the well-known beam power tetrode. Although run at the full rating of 375 volts on the anode, and a screen voltage of 250, the valve has shown no signs of rapid deterioration. The 6L6 is listed as delivering 11.5 watts audio output under these conditions, but this will not be obtained unless the loudspeaker or modulation transformer is very accurately matched. Even a small error in matching the anode load to the valve results in quite a large drop in audio output. The anode load of the 6L6 is 4,000 ohms and no difficulty should be met in matching a speaker or modulation transformer.

It is essential to use fixed grid bias if the full audio output is to be obtained. Battery bias is easily arranged as only about 18 volts are required. Experiments have shown that the use of the usual cathode bias resistance leads to severe distortion on

the peaks, and causes the valve to overheat. The makers recommend -17.5 volts bias for the 6L6, but this should be adjusted until the anode current is 57 mA. It is important to note that the grid circuit resistance should not exceed 100,000 ohms with fixed bias. It should also be remembered that the values

of the anode current and bias only hold good for the stated anode and screen voltages, and the maker's list should be consulted if lower voltages are used.

The total current required for the amplifier is 65 mA. at 400 volts for the H.T., and 6.3 volts at 2 amps for the valve heaters.

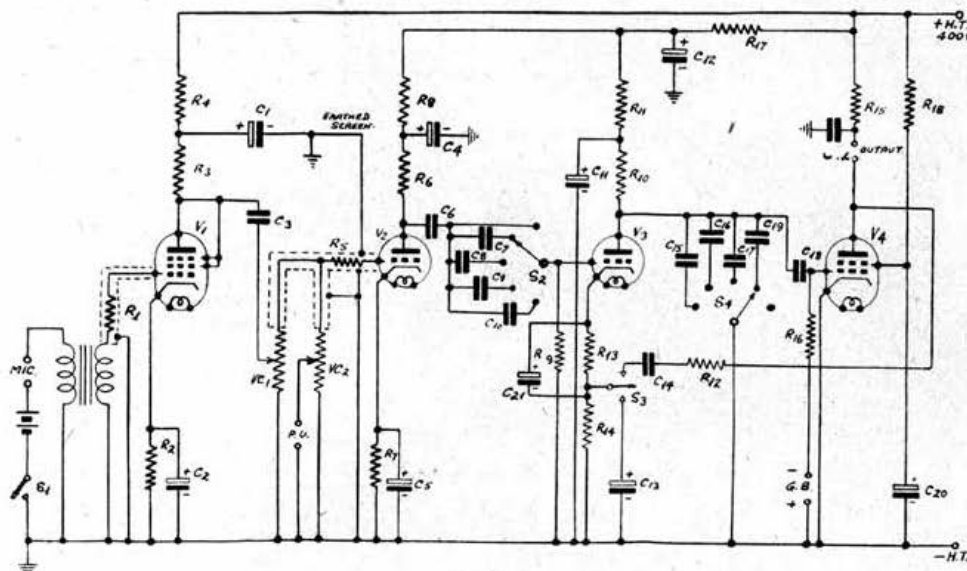


Fig. 1.

Circuit diagram of the amplifier. Note that the first valve is a pentode connected as a triode.

Resistances.

R1, R5	5,000 ohms.	$\frac{1}{4}$ watt	Bulgin.
R15	2,000 ohms.	20 watt	
PR7 (see text)			
R2, R7	2,000 ohms.	$\frac{1}{2}$ watt	
R3, R6	200,000 ohms.	1 watt	Erie.
R4	40,000 ohms.	$\frac{1}{2}$ watt	
R8	50,000 ohms.	$\frac{1}{2}$ watt	
R9	250,000 ohms.	$\frac{1}{2}$ watt	
R10	75,000 ohms.	1 watt	
R11	50,000 ohms.	1 watt	
R12	15,000 ohms.	1 watt	
R13	5,000 ohms.	$\frac{1}{2}$ watt	
R14	500 ohms.	$\frac{1}{2}$ watt	
R16	100,000 ohms.	watt	
R17	100,000 ohms.	1 watt	
R18	80,000 ohms.	2 watt	

Condensers.

C1	4 μ F 300 volt	Dubilier Electrolytic
C4, C11, C20	4 μ F 570 volt	
C12	8 μ F 570 volt	
C2	50 μ F electrolytic 12 volt, Dubilier 3601.	
C3, C8	.1 μ F tubular 400 volt, Bulgin PC.P1.	
C5, C13	25 μ F 25 volt electrolytic, Dubilier 3601.	
C6, C7	.25 μ F tubular 400 volt, Bulgin PC.P25.	
C9, C16	.01 μ F tubular 400 volt, Bulgin PC.I01.	

C10, C17	.001 μ F tubular 400 volt, Bulgin PC.201.
C14	1 μ F paper 600 volt, T.C.C. type 95.
C15	.05 μ F tubular 400 volt, Bulgin PC.105.
C18	.1 μ F oil immersed 1,500 volt, Dubilier 950A.
C19	.0001 μ F tubular 400 volt, Bulgin PC.301.
C21	25 μ F 12 volt electrolytic, Dubilier 3601.
C22	2 μ F paper 600 volt T.C.C. type 95.

Other Components.

VC1	100,000 ohms Volume Control with two-point switch, Bulgin VM48.
VC2	100,000 ohms. Volume Control, Bulgin VC48.
S2, S4	Five-way rotary switch, Bulgin S.119.
S3	Single-pole changeover switch, Bulgin S.81.
4	Octal chassis valve-holders, Bulgin VH40.
5	Terminals marked Input (2), Input -(2), and Earth, Belling Lee type B.
2	Screened valve caps, Bulgin P.103.
1	Phone jack, Igranic.
1	Three-way connecting block.
2	Ten-way Group boards, Bulgin C.32.
1	Two-socket strip marked L.S., Belling-Lee No. 349.
1	Microphone transformer, ratio 60 to 1 (if carbon microphone is used), Premier.

Valves.

V1, 6J7, V2, 6F5, V3, 6C5, V4, 6L6. Raytheon.

The Condenser connected to R15 and the output is C22

Construction

The amplifier is constructed on a chassis made of 18 S.W.G. sheet steel, folded over on all four sides. It measures 15 in. x 9 in. x 3 in. deep and is finished with light grey enamel. The right-hand end of the chassis is divided into two compartments measuring $5\frac{1}{2}$ in. x $5\frac{1}{2}$ in. and $5\frac{1}{2}$ in. x $3\frac{1}{2}$ in., as can be seen in Fig. 3. The first of these contains all the components of the first stage and the two volume controls. The other compartment holds two 9 volt grid bias batteries. The screening of the first stage prevents

The anode voltage should be adjusted to 375 volts (on load) by moving the sliding clip on R15, after the speaker is connected. The output is brought out to a two-pin socket so that speaker or modulation transformer may be plugged in at will. The amplifier should never be switched on without a load connected to the output, as it is very detrimental to the life of the 6L6 to have a voltage on the screen when the anode is not connected.

The grid stopper resistances R1 and R5 are mounted inside the screened caps which connect to

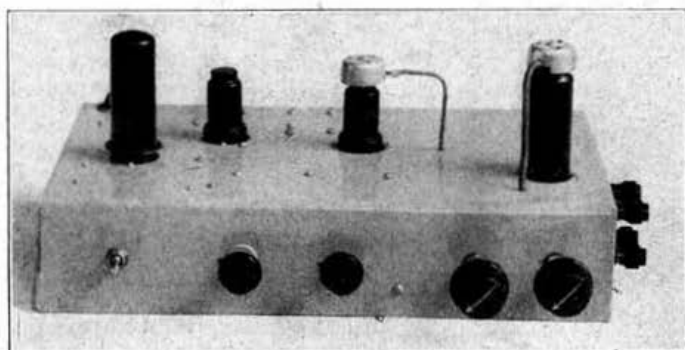


Fig. 2.
Front view of amplifier. The various controls are described in the text.

inter-reaction with the later stages and makes for great stability.

A large number of the wire-end condensers and resistances are mounted on two group boards. All the condensers used in the tone control circuits are fixed on one board which is mounted close to the switches. The positions of the group boards can clearly be seen from Fig. 3.

A multiple electrolytic condenser block is used for the decoupling circuits. One flange on this is bent round, so that it can be fixed to the rear side of the chassis, while the top of the block is supported by a small clip, also mounted on the rear side.

A jack is provided in the 6L6 anode circuit so that a check on anode current may be readily obtained.

the top caps on V1 and V2. The *Bulgin* cap used will comfortably hold a $\frac{1}{2}$ watt resistance, but care should be taken to see that it does not touch the outer shield of the cap.

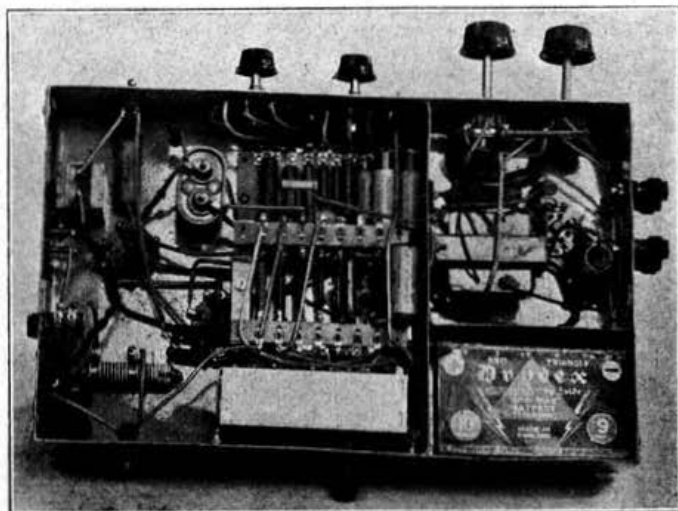
The fixing bush of the bass-cut switch is insulated from earth by means of a pair of insulating washers, as the moving contact does not work at earth potential. The two volume controls should be mounted in the same way, a pair of special washers being supplied with each control.

The amplifier is connected to the power supply by a four-way cable terminating in a *Belling-Lee* five-pin plug and socket.

Reference to Fig. 2 will show the position of the controls. The negative feed back switch is on the

Fig. 3.

Underside view of amplifier. The two screened compartments mentioned in the text can be seen at the right-hand side.



extreme left, next are the treble and bass-cut switches, and on the right hand side are the two volume controls.

To ensure a perfectly hum-free output, the amplifier should be placed on a sheet of metal, and connected to earth.

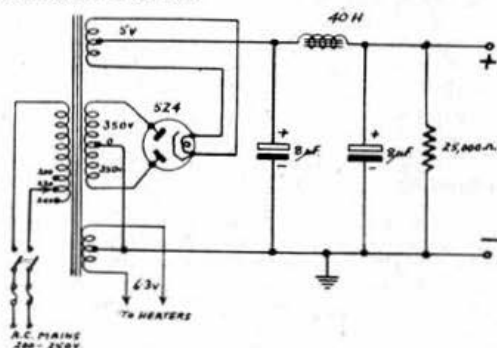


Fig. 4.

Circuit Diagram of Power Pack.

Mains transformer. 350-0-350 volts at 150 mA. 6/3 volts at 3 amps. 5 volts at 2 amps. Premier Supply Stores.

1 smoothing choke, 40h. 150 mA, Premier.

1 5Z4 Raytheon valve.

1 octal ceramic valve-holder, Webbs.

2 8 µF electrolytic condensers, T.C.C. type 512.

1 two-pole on-off switch, Bulgin S.104.

1 fuse holder and mains connector, Bulgin F.18.

1 25,000 ohms. 20 watt resistance, Bulgin P.R.14.

Power Supply

Many readers will have a suitable power supply available, but for those who wish to construct one a design is given in Fig. 4.

A 5Z4 rectifier is employed in conjunction with a Premier mains transformer giving 350-0-350 volts at 150 mA., 6.3 volts at 3 amps and 5 volts at 2 amps for the rectifier. A 40 henry choke and an 8 µF. electrolytic condenser are used for smoothing and are ample to ensure a perfectly smooth supply. A 25,000 ohm bleeder resistance is connected across the output. With a load of 65 mA. the output is 410 volts, and is, therefore, perfectly satisfactory.

The writer will be pleased to hear from any reader who builds this amplifier and to discuss any details not fully covered here.

Editorial Comment

It is suggested that the cathode bias specified for the 6F5 (V2) could, with advantage, be increased to 3,000 ohms which is the value recommended by R.C.A. The cathode bias for the 6J7 (V1) could also be increased to a similar value although the R.C.A. specify 10,000 ohms when the valve is operated in the manner described.

If it is proposed to use a crystal type of pick-up it may be found desirable to increase the values of VC1 and VC2 to 500,000 ohms inserting a resistance of 100,000 ohms in series with the lead from the slider of VC2 and the pick-up.

D. N. C.

Valve Review

Osram Z62

The Osram Z62 is an indirectly heated R.F. pentode having a high slope and intended primarily for use in short-wave or wide-band amplifiers. It is only about two-thirds the length of a normal tube and is fitted with an octal base, the control grid being connected to the top cap.

The Z62 is made by Messrs. General Electric Co., and priced at 12s. 6d.

Characteristics	Makers	Sample
Heater volts ...	6.3	6.3
Heater currents (amps.)	0.45	0.45
Anode volts (max.) ...	300	300
Screen volts (max.) ...	150	150
Grid volts ...	-2	-2
Anode current (mA.)	10	12.5
Screen current (mA.)...	2.3	2.6
Cathode bias (ohms.)	160	—
Mutual conductance mA/V.*	7.5	9.1
Impedance (megohms.)*	0.75	0.63
Input resistance at 40 Mc. (ohms.) ...	4,000	—

Interelectrode capacities

Grid-anode (in shield) µF	0.02	0.038
Anode-all (in shield) µF	8.0	7.36
Grid-all (in shield) µF	10.8	11.0

Dimensions	Makers	Sample
Overall length m.m.	88	—
„ diameter m.m.	31	—

Characteristic Curves

Tests on the sample showed that the anode current was rather higher than the published figures although the cut-off was satisfactory. The higher anode current explained the high figure of mutual conductance obtained. An earlier sample showed considerably lower mutual conductance. The grid-anode capacity is somewhat higher than the published figure, but an earlier sample gave a value of 0.024 µF which is much closer.

The characteristics indicate that the valve would be very satisfactory for use as an R.F. or I.F. amplifier in television receivers or in short-wave receivers. It would also make an excellent detector.

The small dimensions are achieved by reduced electrode size and by the employment of a short seal which together result in short lead wires giving an improved performance up to 60 Mc. At the same time a high input impedance is obtained, making due allowance for the high slope.

The makers also publish data for its use as a higher gain wide-band A.F. amplifier.

The valve can be recommended to those building or modernising their short-wave receivers.

D. N. C.

* Measured at E_a 300, E_g 150, E_g -2.

WIDE-BAND FREQUENCY MODULATION SIMPLY EXPLAINED

By J. C. EGERTON, B.A. Cantab. (G8MU)

Frequency Modulation, although little known to amateurs in this country, is exciting great interest in the U.S.A. For that reason a simple explanation of fundamental principles may be welcomed by readers.

It is desirable at the outset to consider what is the essential difference between Amplitude Modulation (the method used before the war at British amateur stations), and Frequency Modulation. In the former case the amplitude of a constant frequency carrier wave is varied in accordance with the amplitude of the audio frequencies to be transmitted, whilst Frequency Modulation consists in varying the frequency of a constant amplitude carrier wave. The difference between the frequency of the unmodulated carrier and the peak frequency of the modulated carrier is known as the *deviation*. The band-width of a frequency modulated signal is thus twice the deviation. The latter corresponds to the percentage modulation of an amplitude modulated transmission, and the rate of deviation corresponds to the pitch of the modulation frequency of the amplitude modulated transmission. It appears that the limit of modulation (after which the signal would be over-modulated) is chiefly set by the frequency band which the receiver will accept.

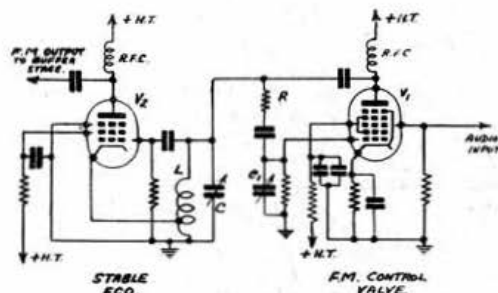


Fig. 1.

Frequency modulated wide-band transmitter. The valve V1 acts as a variable inductance in parallel with the oscillator inductance L. C1 is the deviation control, approximately 5 μ F. R is a 50,000 ohms resistance.

Transmission

One of the chief advantages of the F.M. system is that a substantial saving can be effected in the modulation equipment. For example, to modulate a transmitter operating with an input of several kilowatts it is only necessary to employ enough audio power to modulate an oscillator, which in extreme cases would probably not exceed 10 watts. For plate amplitude modulation the power required is usually half the D.C. input power to the power amplifier which it is desired to modulate. The difference in cost is obvious.

Modulation

It is a well known fact that a valve can be connected in such a way that it will act as a variable inductance when the potential applied to one of its grids is varied. This property is made use of to vary the frequency of a stable electron-coupled oscillator as shown in Fig. 1. In this diagram L.C. is the tank circuit of an e.c.o., the circuit constants of which are chosen to give a high degree of stability. V1 (the control valve), acts as an inductance in parallel with the oscillator inductance. If the inductance of this valve is varied by altering its operating conditions, i.e. by applying an audio frequency voltage to its No. 3 grid, then the frequency of the oscillator will be varied accordingly. It is essential, of course, not to apply a greater modulating voltage to the control valve than will produce linear frequency deviation.

The resulting frequency modulated output from V2 can be amplified and frequency-multiplied with complete disregard for wave-form distortion. The only proviso is that the final frequency modulated wave shall not possess a greater band-width than can be accepted by the receiver. Television practice has shown us that it is quite easy to design a receiver with very wide acceptance. For frequency modulation the demands are not nearly so exacting as for television, in fact for good intelligibility of speech a deviation of about 25 kc. would be quite sufficient, a condition which would require that the receiver should have a band width of 50 kc. For broadcasting purposes the deviation could be any value up to 100 kc.

Readers will appreciate that it would be impracticable for a transmission giving a band width of 50 kc. to be operated on the lower amateur frequencies (even if the G.P.O. permitted it) because

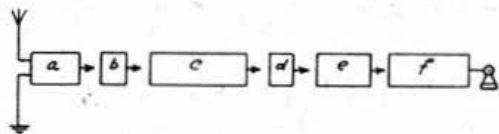


Fig. 2.

A diagrammatic representation of the line-up of a receiver suitable for the reception of frequency modulated transmissions.

- RF amplifier.
- Frequency changer.
- Intermediate amplifier (wide band 50 kc. or greater).
- Signal limiter.
- Discriminator (Detector for F.M. Signals).
- Audio amplifier and output.

the mutual interference between transmissions would be excessive. On the 112 Mc.-116 Mc. band, however, there is so much more space that the F.C.C. of America have given permission for amateur experimental transmissions to be carried out with frequency modulated equipment. The results of the tests are awaited with interest.

Reception

As shown diagrammatically in Fig. 2, the receiver used for F.M. reception can be considered as being divided into six major parts.

- (a) H.F. amplifier (optional).
- (b) Frequency changer.
- (c) Broad-band intermediate frequency amplifier (Band width 50 kc. or more; frequency about 5 Mc.).
- (d) Signal limiter (to remove any amplitude variation which may occur).
- (e) Discriminator (Detector for F.M. signals).
- (f) Audio Amplifier and output.

Sections (a) and (b) are normal in construction for the frequency band on which it is desired to receive. Section (c) is a standard wide band-width amplifier such as might be used in a television receiver, but of only 50 kc. band-width. Section (d) consists of a pentode valve (operated at greatly reduced screen and plate voltages) which becomes saturated at a very low signal input. This maintains the output to the discriminator at an almost constant value,

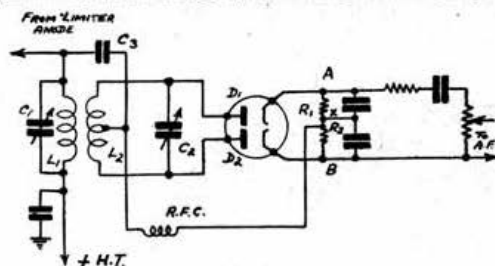


Fig. 3.

Discriminator Circuit.

In a receiver used for the reception of frequency modulated signals, the detector device is described as a Discriminator. The keyed components are discussed in the text.

and smoothes out any amplitude modulation which may be present. The limiter also helps materially to reduce the effects of static, man-made and otherwise. The F.M. method is well known for its ability to give excellent reception in areas where interference from man-made static is very great, for example in a certain U.S.A. locality it is reported that a perfectly readable F.M. signal could be obtained at a time when an A.M. signal of equal carrier amplitude was completely lost in the background.

Section (e) (the Discriminator) is perhaps the most difficult part of the receiver to understand. If reference is made to Fig. 3, it will be seen that the output from the limiter anode goes to the primary of an intermediate frequency transformer. The signal is also applied to the centre point of the secondary *via* the condenser C3, which has a value of 30 μ F. The anodes of two separate diodes are connected, each to opposite ends of the secondary L2. The diode load resistances R1 and R2 are connected

together at X and this point is also connected through an R.F. choke to the centre point of L2. The cathode of D2 is earthed and the audio output is taken across the two cathodes. Neglecting the input *via* C3 for a moment and considering an unmodulated signal, it will be seen that there will be a voltage developed across R1, such that X becomes negative with respect to the cathode of D1, similarly X becomes negative to the cathode of D2. As these circuits are balanced the voltages across R1 and R2 will be equal, and the points A and B will be at the same potential. If we consider the effect of amplitude-modulating the signal, it will be seen that the two resulting audio frequencies across R1 and R2 will be equal and will cancel out.

Now consider the effect of a varying frequency on the tuned circuit L2 C2. For frequencies above resonance the circuit will offer an inductive impedance, and for frequencies below resonance it will offer a capacitive impedance. If the input *via* C3 is now considered, it will be realised that in one direction it will be in phase with the output from the circuit C2 L2, and in the other direction it will be in phase opposition. Let us assume that matters are so arranged that when the positive half cycle is at the top end of L2, the signal *via* the condenser and that due to induction, are assisting one another, and that when the positive half cycle is at the bottom end of L2 the two inputs are in phase opposition. In that condition the rectified voltage across R1 will be greater than that across R2. The point A will now vary between zero and a positive potential, depending upon the magnitude of the phase difference between the signal *via* V3, and that due to the induction between the primary and secondary of the R.F. transformer. This phase difference depends upon the deviation of the transmitted signal. It will thus be appreciated that the greater the deviation at the transmitting end, within practical limits, the louder will be the received signal. Circuit constants have to be chosen so that the Discriminator will handle the required frequency deviation with linear output.

Section (f) is a conventional audio and output section and needs no special description.

Phase Modulation

In America Major Armstrong has developed a form of frequency modulation known as "Phase Modulation." In this system he combines a carrier voltage with a sideband voltage which has been rotated in phase by 90 degrees. The deviation produced is dependant upon the magnitude and frequency of the modulating signal, and is thus not quite pure frequency modulation. Compensating circuits have therefore to be introduced into the transmitter to correct this condition. The additional complication is however more than justified by the fact that a crystal oscillator can be used, which gives greater stability than an electron-coupled oscillator. However for amateur transmission the e.c.o. should be quite stable enough for all practical purposes.

Conclusion

The writer hopes that when the present troubles have ceased and British amateurs are once again permitted to transmit, the G.P.O. will grant facilities

(Continued on page 424.)

AN EMERGENCY SET IS VITAL



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L.T. 2v., .5 amps
H.T. 120v., 12 MA.

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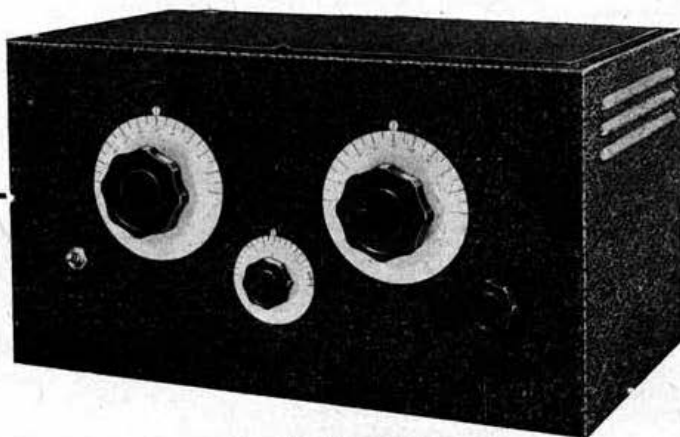
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THE SUSPENSION OF LECHER WIRES

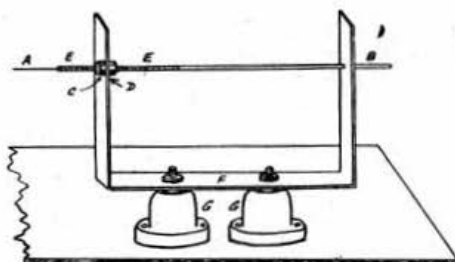
By CONSTANCE HALL (G8LY)

ALTHOUGH most wireless text-books describe the use of Lecher Wires and frequently illustrate the text with a sketch, it is seldom that the latter shows more than the "home end" suspension, the reader being left to guess how the other end is supported. The obvious method seems to be to use stand-off insulators, but it will soon be found that if the length is in excess of about 3 ft. and the wire rather thin a definite sag will occur in the centre.

The writer having decided to utilise Lecher wires on the "ultra highs" as a cross check with her wavemeter and finding only 14 gauge copper available, it became necessary to devise a method of suspension which would obviate sag. The simple device illustrated was the outcome.

This method of suspension applies to one end of the pair of wires only, the other end being supported by stand-off insulators. It will be noted that the arrangement permits adjustments of length to be made, which seems to be a useful feature.

The stand-off insulators at the distant end to that illustrated must be raised up from the baseboard in order to bring the wires parallel with the rods at the adjustable end. To ensure that a rigid result is obtained the baseboard should be of real hard wood, at least $\frac{3}{4}$ in. thick, so that the stand-off insulators will not rise up under the strain, which incidentally is greater than might be expected.



A novel method of suspending Lecher wires.

A—Lecher wire. E—Threaded portion of B.
B—Rod. F—Bracket.
C & D—Adjusting Nuts. G—Stand-off insulators.

The length of the wires will of course depend upon the lowest frequency to be used, whilst the size of parts used for the suspension described will vary according to the capacity of the constructor's junk box.

The extension rod B. (which can be of a size 6 in. x $\frac{3}{8}$ in.) is threaded for about 4 in. at one end. This same end is drilled down for about $\frac{3}{8}$ in. to a size which will take the wire. The latter is then soldered securely to the rod. The bracket measurements are unimportant provided there is a space (F) sufficient to take two holes for fixing it to the insulators.

The rod fixing holes at the sides of the bracket must be drilled very accurately to ensure that the wires pass through quite parallel.

The nuts C. and D. provide a simple means for adjusting the wires. By unscrewing C. and tightening D., the wire can be pulled taut. In order to get both wires equally taut, "ping" them until they respond to the same tone.

One final tip—when fitting the bracket on to the insulator see that it beds down without undue strain, otherwise something, somewhere, will snap!

News from Trinidad

Mr. Douglas Gordon Bagg, VP4TO-G6BD, reports that the local Pointe-à-Pierre Society—P.A.P.A.W.S. is continuing its activities. After 15 months of effort, arrangements have now been made to take possession of a suitable building as Headquarters. This will enable the Society to fit out a workshop and operating room as well as a library, storeroom and committee room.

The first A.G.M. of the Society was held on January 30th, when the following officers were elected for 1940:

Chairman	...	D. G. Bagg.
Joint Hon. Secretaries		J. R. Patton and G. R. Whittles.
Technician	...	A. Blue.
Librarian	...	L. F. Loveless.
Ordinary Member	...	P. S. Verity.

It was agreed to continue the work of the Society on the same lines as before with no reduction in entrance fee or subscription. Meetings are being held fortnightly when lectures of a radio or general electrical nature are given by members and invited guests.

Mr. Bagg who has just left Trinidad for a vacation in the U.S.A., hopes to visit A.R.R.L. Headquarters at Hartford.

The Easter Fade-out

Mr. A. J. Parker, G6QZ, of Norfolk sends the following observations recorded during the afternoon and evening of the big fade-out on March 24. G.M.T.

	REMARKS.
14.00	East Coast U.S.A. signals on 14 Mc. weak and "watery." 28 Mc. band "dead."
18.20	Range 26-36 Mc. "dead" except for IBT on about 32 Mc. at S6 with fades to zero. Background noise higher than usual with bursts of roaring. "Hiss" identified.
18.35	14 Mc. band completely "dead." No signals higher than 17 Mc., mean strength only S4. Stations in the 15 Mc. B.C. band had quick flutter. B.B.C. station S3/4 and only R3. "Hiss" pronounced.
18.45	7 Mc. band "dead" and very few commercials on neighbouring channels.
18.50	Stations in the 6 Mc. B.C. band badly attenuated and fluttery.
18.52	Broadcast stations in the 7.3 Mc. band very weak.
18.55	Weak unreadable carriers heard in the 14 Mc. amateur band. Commercial signals beginning to improve.

KHAKI AND BLUE

A topical feature in which we publish information concerning our members serving in H.M. Forces. Items for inclusion in future issues should reach the Secretary-Editor not later than the first day of the month preceding date of publication.

G2MI and 6CL were glad to have the opportunity early on the morning of March 15 of meeting at a London station, L.A.C. Merton Trier, G8VH, L.A.C. Ernie Dolman, 2DCG, L.A.C. M. A. Brookes, G5OI, A.C.1 G. T. Stuttard, G2MB, L.A.C. J. E. P. Raven, G3HG, L.A.C. L. M. Gunnell, G8HB and L.A.C. R. Q. Marris, 2BZQ, who were returning on leave to the B.E.F. For the first time since the war began copies of THE BULLETIN were in France on publication day.

Headquarters hope that other groups of hams returning to France will advise us of their time of departure.

* * *

London members appreciated the opportunity last month of meeting Cpl. Charles Boughner, VE3IM, who is serving as an instructor in the Canadian Air Force. Mr. Boughner was present at the South London high tea and at the Farnborough gathering held on March 17. At the latter meeting he met many old friends from the land of the Maple Leaf.

* * *



Lt. Don Knock, VK2NO, who is with the 1st Divisional Australian Corps of Signals.

News has reached us that nearly 20 VE amateurs are in England with the Canadian Air Force. It is hoped to arrange a meeting in Salisbury at an early date; in the meantime British amateurs at No. 2 E. & W. School may like to contact their friends from Canada. Addresses can be obtained from G6CL.

* * *

In a long and interesting letter Don Knock, VK2NO, gives us news of Australian activities. Don is serving as a Lieutenant in the Australian Corps of Signals, and although, as he suggests, age may count against him this time, he is still hopeful of coming to England with the A.I.F. To quote his own words "it won't be a real war somehow unless a few Diggers are seen around Trafalgar Square"!

Don reports that a large number of VK's are in the Services including 2HZ, 2LZ, 2VN, 2ZC, 2ZH, 3ML and 3UH. He makes the suggestion that any "ham" serving with the R.A.F. should keep a few D QSL cards in his pocket in case he happens to



Bill Wadsworth, VE5ZM, one of the best known DX Canadian Amateurs and a moving spirit behind the recent successful Ham Gatherings at Farnborough

make a forced landing on the wrong side of the line!

Old timers will remember that Don Knock operated under a G call for some years prior to joining the staff of the Australian newspaper *The Bulletin*.

* * *

Reg. Farr, G8IJ, who has been posted as W./Op. to a Norfolk squadron of the R.A.F., tells us that during his stay at No. 2 E. & W. School, he met about 40 amateurs at informal meetings held in No. 1 Wing Canteen. It is a little surprising that no news of these meetings has reached us for publication. Reg. sends 73 to all old friends and especially to those he met at the training school. He will be pleased to receive letters *via* Headquarters.

* * *



Pilot-Officer Douglas Walters, R.A.F., G5CV. In pre-war days Radio Correspondent of *The Daily Herald*.

In our February Active Service list, we inadvertently recorded the name of Edgar Greenwood, BRS2198, as a non-member. Mr. Greenwood is a member and just prior to the outbreak of war he was granted the call G4OS. Until recently he was serving in the R.N.V.(W.)R. (not R.N. as given in our list) but we now learn that he has been invalided home. His present address is 44 Hoole Road, Chester.

In the same list the call G4KZ was shown against the name A.C.2 N. A. Owen. The call should have read G4KS. The holder of G4KZ is T. J. Norton, of Grantham, who is at present serving in France.

ALDERSHOT & FARNBOROUGH MEETING

*All Radio Amateurs (Service or otherwise)
located in the above area are cordially
invited to attend the*

Third Ham Gathering

on

Sunday, 21st April, 1940

*The 1938 R.S.G.B. Films
will be displayed*

**Meet at Y.M.C.A., off Lynchford
Road, North Camp, Farnborough,
at 2 p.m. Tea 3.30 p.m.**

Sgt. Frank Adams, G2YN, who was on leave from France last month is anxious to meet fellow amateurs who are serving in the R.A.F. Frank regrets that the names of units, to which B.E.F. members are attached, cannot be published in THE BULLETIN. We also regret it, but the Censorship authorities have instructed us that such information must not be given. Mr. Adams proposes to draw an outsize R.S.G.B. badge on a sheet of cardboard so that he can display it on the windscreen of his car whilst going the rounds! (Here's an idea for one of our Ham printers!)

Apparently at the R.A.F. station in France to which several of our members are attached, it is customary to have regular gas respirator drill. The February BULL. arrived just as a drill was commencing, so the ham fraternity started a new fashion by reading it garbed in their respirators. (Fashion papers please copy!)

Lt. Alvin Pryor, 2FTR, records his appreciations to the Bury members who made his stay in that town so enjoyable. He desires to thank especially the T.R., Mr. T. C. Platt, G2GA, and his wife, and also Mr. F. B. Holt, G3ZN, for their unfailing hospitality.

Jack Drudge-Coates, well known as VU2FO, G2DC, and Y-DCR writing from Karachi where he is serving in the R. C. of S. sends greetings to all old friends. He tells us that he frequently listens on 14 Mc. but misses his chats with the G's.

We were glad to meet Cpl. Brian Lagden, G3GX, of Whetstone, when on leave from France last month.



Captain R. H. B. Candow, M.I.R.E., now serving with the Royal Ordnance Corps was in pre-war days the operator of the Scottish station GM5SC.

Brian is associated in his section with several well known North London hams including Sgt. E. S. Wilson, G5CW, L.A.C. Keith Adams, G5NW, L.A.C. L. F. Viney, G2VD, and L.A.C. Ken Aris, G8GC. Other amateurs in the section are Cpl. Fred Ingleton, G6FI, Cpl. P. W. Barnes, G2XB, L.A.C. S. Parr, G6AN, and Sgt. K. Holland, G3LL.

L./Cpl. Jack Millie, GM8MQ, who is in France with the R. C. of S., has yet to meet a fellow amateur



Reg. Farr, G8IJ, is serving as a Wireless Operator with a Norfolk Squadron of the R.A.F.

serving abroad. He wishes to be remembered to all old friends especially those contacted during B.E.R.U. and N.F.D. Contests.

Old friends of Monty Campbell, G8MK, will be glad to hear that he is fit and well in spite of a winter with the B.E.F. He has not contacted any amateurs for some months but he hopes that pleasure will not be too long delayed. Monty, who is a L./Cpl. in the Signals will be pleased to hear from Midland or Thames Valley pals via H.Q.

We learn that Ray Bottomley, G6TZ, of Coventry has been in Base hospital as a result of a mastoid operation. This information reached us via G8MK who tells us that Ray was with him until Christmas, since when they have lost touch.

L.A.C. J. A. Ward, G4JJ, who is serving with the R.A.F., will be pleased to hear from his friends. Letters should be sent via his home address 44 Northgate, Barnsley.

A. H. Broomfield (G6OQ), who is serving as a Telegraphist on one of the P. & O. boats sends greetings to his friends in London. Arthur records another instance of real "ham spirit"—VU2GB, hearing that he was in Indian waters around Christmas time, arranged for his wife to send him a special cake, but unfortunately he had left for other climes before it arrived. The fate of his cake reminds us of a Christmas parcel containing, among other delicacies, a chicken which ultimately reached a certain "hot spot" in Belgium towards the end of February, 1918!

AC.2 G. R. Hirst (G3ZT), who is employed at an A.M.E.S., would like to hear from members living in the East Essex area. Letters can be sent via H.Q. G3ZT wishes to be remembered to G2DF, 5PY and GM3BA.

Ken Racombe, ex-ST6KR, ex-YI2GQ, ex-SU, YI and ZC6KR sends cordial greetings to all old friends, especially those who gave him pleasant contacts whilst in Iraq, Egypt and the Sudan. Ken is now a Flight-Sergeant with one of the R.A.F. squadrons located in the land of the Pharaohs.

Congratulations to Staff Sergeant E. J. Hartley (2FBI) of Burnley (photograph herewith), upon his marriage during the Easter holidays to Miss M. Fothergil. Sgt. Hartley is a Wireless Armament Artificer with the R.A.O.C.



Staff Sergeant E. J. Hartley, 2FBI.
Joins the ranks of the Benedicts.

The many friends of Bert Allen (G2UJ), who has since September been serving with the R.A.F., will be sorry to learn that he has been invalided home from France with bronchial-pneumonia. He is at present in hospital at Epsom. Full address from G6CL.

Donald N. Biggs (G6BI), now an L.A.C. in the R.A.F., wishes to be remembered to all members of the Kingston and District Amateur Radio Society, of which Society he was originally Secretary and later President. Don is a Radio Mechanic and under training at a Northern camp. All letters should be sent via 6 Norn Hill, Basingstoke.

Ham Coincidence, No. 3

Whilst attending a New Year function in India Jack Drudge-Coates, VU2FO, chanced upon an old friend who had enlisted with him just on 20 years ago. Celebrating their re-union after a lapse of 18 years the talk turned to "ham" radio. Judge of Jack's surprise and astonishment when he discovered that his companion was VU2HB whom he had worked dozens of times completely ignorant of his identity.

R.A.F. MEETING

*A cordial invitation is extended to
all members and friends located
in the neighbourhood
to attend a*

MEETING

on

Sunday, May 19th,

**At The Queen's Head, Kirkby
Laythorpe, near Sleaford. Meet
4 p.m. Tea 4.30 p.m.**

Tickets and full details from Mr. N. Davies,
Hon. Secretary, R.A.F. Amateur Radio
Society, No. 1 E. & W. School.

Ham Coincidence No. 4

J. H. Brazzill, G3WP, and T. C. L. Littlemore, G8AX, met for the first time in R.N. Barracks shortly after the outbreak of war. Eventually the latter left for an unknown destination. Some time afterwards G3WP had occasion to spend a night in a Liverpool hotel where he was told that the only room available was one containing two single beds. Just after retiring for the night a knock came at the door and on opening up G3WP found G8AX standing outside. Unknown to the other each had been sent on a job to the same area on the same day, and by a thousand to one chance both had chosen the same hotel.

That coincidence should have been enough for one war, but yet another must be recorded. Three months later G8AX stepped ashore at an east coast port only to "walk into" G3WP almost immediately. Fate has decided to put a stop to further coincidences, because they are now working together!

In Good Company!

"The G.P.O. has collected, sorted and delivered my gear into *wine vaults* in Bath, I hope it will not have been entirely demoralised by its surroundings by the time it comes out again!"

G2—.

KHAKI AND BLUE MEET AGAIN AT FARNBOROUGH

By **BLenheim**

HEAVERY rain did nothing to damp the enthusiasm of the 50 odd amateurs who assembled at the Y.M.C.A. Building at North Camp, Farnborough on Sunday, March 17, to renew old and make new acquaintanceships.

Canadian Amateur Radio was well represented by VE3AAT, 3AMB, 3APG, 3ATK, 3AUB, 3AYO, 3JO, 3SC and 5ZM, whilst a special welcome was extended to Cpl. C. Boughner, VE3IW (Canadian Air Force), F./Lt. H. A. M. Whyte, G6WY (R.A.F.) and Messrs. Dedman, Gay and Clarricoats from R.S.G.B. Headquarters. The latter in a brief speech after recording his pleasure at meeting in person so many Canadian amateurs expressed the hope that as a result of the personal contacts which had been established it would be possible to weld

would be arranged. A proposal to hold another meeting on April 21 met with unanimous support, as did a suggestion to display the 1938 R.S.G.B. films on that occasion.

Among others present were Miss Nelly Corry, G2YL, Miss Constance Hall, G8LY, F./Sgt. Lambourne, G5AO, and Sgt. Laker, G6LK. In addition to the large number of G's on parade, Wales was represented by F./Lt. Parsons, GW8NP, Scotland by Cadet J. J. MacBeth, GM3CG, and Northern Ireland by Cpl. J. Adams, GI5AJ.

The writer, on behalf of all visitors, records his thanks to the organisers, Bill Wadsworth, VE5ZM and Jim Kirk, G6ZO, not forgetting the many other members of the O.C.T.U. who did such valuable work in whipping up the Service personnel.



THE SECOND FARNBOROUGH MEETING, MARCH 17, 1940.
Extreme left G6CL, 8LY, 6WY. Extreme right G6NF, 2NH.

together, in a manner which had never been possible in the past, the Canadian and British amateur organisations. He stressed the need for a post-war Canadian National Society and urged all VE's present to keep that thought in mind. He referred to the efforts being made by the R.S.G.B. to establish contact with all overseas amateurs serving with the Forces in Great Britain.

G6WY spoke of the splendid manner in which the "hams" in the R.A.F. had shown their ability and resourcefulness. As one of the most active DX amateurs in pre-war days he expressed pleasure at being able to meet in person many Canadians who up to that day had been but call signs.

G6NF warmly congratulated the organisers of the meeting and made some well-appreciated remarks concerning the A.R.R.L. Contest which was taking place during the weekend of the meeting.

The D.R., Mr. W. E. Russell, G5WP, in supporting G6NF said he hoped that future Service gatherings

From Our Post Bag

"I feel I must tell you how grateful I am to Council for deciding to carry on. Losing our experimental privileges is just about heart-breaking, but to have lost connection with the R.S.G.B. would have been the end of everything.

"I would like to register my appreciation of the kind thoughts frequently expressed by Council in THE BULLETIN to members serving in H.M. Forces, and Council's generosity in reducing our 'sub' to ten shillings."

2AVV, Sub-Lt., R.N.V.R.

"Here's wishing the Society every success in its efforts to keep the flag flying during the war and may I say how greatly the 'BULL' is appreciated, as it is the only link nowadays to keep the amateurs of the country in touch."

G3PT.

The R.A.F. Foregatherers

AT 4 p.m. on Sunday, March 31, a party of hungry airmen arrived at "The Queen's Head," Kirkby, Laythorpe, their appetites keen after a two-miles walk from Sleaford.

G6NZ, 8RW and 6TV already on the spot (presumably to see the kettle put on for tea), distributed plain card badges, which soon established the identity of the visitors and made formal introductions unnecessary.

Whilst the delicious odour of frying eggs and bacon spread through the establishment, all assembled outside for the inevitable photo. This ordeal over, there followed a rush towards the tea room and in a short space of time full justice was being done to the excellent Linconshire meal provided. Arrangements had been made for 25, but the management had no difficulty in catering for the 38 who actually arrived.

Having concluded this most important item on the agenda we were able to devote our attention to F./Lt. Newnham (G6NZ) who, after reading a message of greeting from "Clarry," proceeded to draw attention to the vital necessity for supporting R.S.G.B. to the utmost during the difficult times ahead, in order to ensure our regaining amateur transmitting facilities after the war.

A general discussion followed and the view was expressed that the reduced fee of 10s. per annum was still rather high for certain members serving in H.M. Forces. One member suggested that a quarterly "BULL" might permit a further reduction to be made, but it was pointed out that this would probably be impossible on account of advertising difficulties. (We can think of many other reasons why such a suggestion would not be popular!—Ed.)

In response to a request G6TV then spoke for a few minutes on the history and objects of the R.A.F. Amateur Radio Society. After drawing attention to the peculiar difficulties attaching to "ham" operation at R.A.F. stations, he outlined the valuable work already done on behalf of serving amateurs and suggested what might be accomplished in future if all interested personnel would give the Society their full support. G6TV concluded by paying a warm tribute to the excellent foundation laid by G2LR and G6AC.

Then followed an interesting talk on Amateur Radio in Malta by ex-ZB1O, whose description of N.F.D. with the co-operation of the manager of the local brewery caused considerable amusement.

Lastly, ex-GKLN recalled some past adventures whilst acting as second op. on s.s. "Glenshiel" in the Far East. Strange tales of derelict Chinese junks, of pearl fishers and man-eating sharks struck a bizarre note on this Sunday evening in a peaceful country village.

The evening concluded with a short movie show which included a film composed of odd shots of N.F.D. taken during the last few years at District 173.5 Mc. stations.

It was only the gloomy prospect of missing the last bus from Sleaford that forced our unwilling steps homeward and back to "somewhere in England."

G6TV.

Technical Books for Disposal

Mr. J. W. B. Evans, GW3GL, The Apiaries, Conway, North Wales, will be pleased to send back issues of *QST* and *Television and Short Wave World* to any Service member who is interested.

Southern Rhodesian Amateurs Carry On

From *The Bulawayo Chronicle* dated March 1 we learn that radio amateurs in Southern Rhodesia have been formed into an organisation known as "Auxiliary Defence Wireless Stations" which is supplementary to the official Post Office and Military organisations.

A.D.W.S. have been established at Bulawayo (two stations with three operators), Umtali, Shangani, and Mashaba, whilst an additional station is being opened at Mrewa. They work with the control station located at Salisbury on regular schedules and use purely military procedure in their communications. The stations enable the military authorities to keep in contact with different parts of the Colony and at a time such as the present their services are of the greatest value.

We are indebted to Mr. F. G. Whitmore, ZE1JJ, for sending us via G2YL the issue of *The Bulawayo Chronicle* containing the above information.

British Isles amateurs congratulate their friends in Southern Rhodesia upon being given an opportunity of putting their knowledge and their stations at the disposal of the Colonial Government.

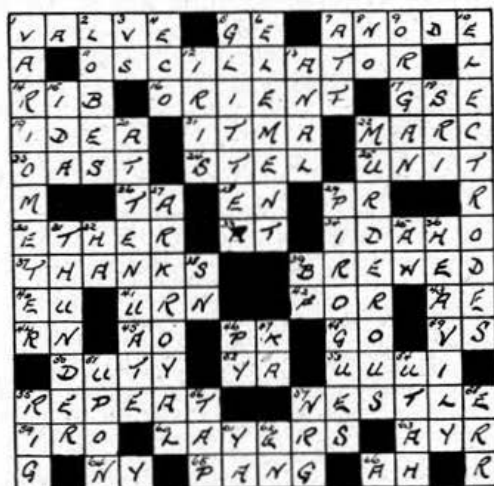
Appreciations

Gunner W. D. Wadsworth, VE5ZM, wishes to record his thanks to the many British Isles amateurs who have entertained him during his stay in England. He also thanks all home members who have in past days given enjoyable QSO's to himself, and to his brother VE5AAD, who is now serving in the R.C.A.F. All DX contacts have been acknowledged, but if any member has failed to receive a card from either VE5AAD or VE5ZM, they are asked to write to him c/o Headquarters.

Mr. Wadsworth will be pleased to hear from old and new friends. Letters may be sent via G6CL.

"HAM-RADIO" CROSSWORD No. 3

SOLUTION



ON ACTIVE SERVICE

SEVENTH LIST

WE publish below our seventh list of radio amateurs on active service. Additional details and corrections should be advised to Headquarters as early as possible. The present list contains information received up to April 2, 1940.

Rank and Name	Regiment or Branch	Pre-war Call or B.R.S.
L.A.C. A. P. G. Amos...	R.A.F. ...	3311
L.A.C. K. Aris ...	" ...	G8GC
Sig. T. Arnold ...	R.C. of S. ...	VU2AN
Ft./Lt. F. H. Babcock	R.A.F. ...	G8LI
Ft./Lt. J. Bamford ...	" ...	G5JB
Ft./Lt. R. M. Bangay	" ...	G3DW
Cpl. P. W. Barnes* ...	" ...	G2XB
P./O. C. J. Bayley ...	" ...	2FYF
L.A.C. D. N. Biggs ...	" ...	G6BI
Capt. M. Bisdee ...	R.A.M.C. ...	VS7MB
A./Cpl. D. S. Bruce ...	R.A.F. ...	GM3NI
Sq./Ldr. Viscount Carlow	" ...	G6XX
Sig. H. Caunce ...	R.C. of S. ...	G6KS
Sgt. J. Drudge-Coates...	" ...	VU2FO
2nd Lt. Sir Mark Dalrymple ...	R.A. ...	3202
Ft./Lt. G. L. Danielson*	R.A.F. ...	G4AM
Lt. W. G. Draper ...	R.A. ...	2AWT
L.A.C. J. Duckworth*	R.A.F. ...	G3FM
Sub. Lt. G. E. Evans ...	R.N.V.R. ...	2AVV
G./Capt. H. W. Evens	R.A.F. ...	G6CH
Ft./Lt. G. Ewens ...	" ...	G3QO
Ft./Lt. I. Orr-Ewing ...	" ...	G5OG
A.C.2 S. Eyre ...	" ...	2FZU
Lt. J. R. Farr ...	Devonshire Regt.	VU2JG
Sig. J. Field ...	R.C. of S. ...	1386
Cadet E. C. Fisher ...	O.C.T.U. ...	3762
Tel. R. Frew ...	R.N. ...	GM8FR
L./S.B.A. H. N. Gant	" ...	3759
L./Bdr. G. R. B. Gautyby	" ...	G6GA
Gnr. G. C. Geddes ...	R.A. ...	G3RI
2nd Lt. J. M. George ...	R.C. of S. ...	2DBO
Cpl. W. R. Grimes ...	Leicester Regt.	2FAA
P./O. H. B. Groves ...	R.A.F. ...	2BGN
L.A.C. L. M. Gunnell ...	" ...	G8HB
Tel. G. G. Harris ...	R.N.V.(W.)R.	G8PC
S./Sgt. E. J. Hartley	R.A.O.C. ...	2FBI
L.A.C. G. W. Hayward	R.A.F. ...	G8BD
A.C.2 R. T. Hewson ...	" ...	G3RH
— F. E. Hoskins ...	R.E. ...	G8DF
S./Inst. J. B. Hudson	R.A.S.C. ...	3298
Tel. F. Jackson ...	R.N. ...	G3NJ
Spr. E. Jeeves ...	R.E. ...	3328
Sig. J. B. Kay*	Middlesex Yeomanry	G3CO
A.C.2 R. Kinnear ...	R.A.F. ...	2BHB
Lt. D. B. Knock ...	Australian C. of S.	VK2NO
A.C.2 F. Knight ...	R.A.F. ...	G4MC
L./Cpl. H. J. Knowles	R.C. of S. ...	BERS

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Rank and Name	Regiment or Branch	Pre-war Call or B.R.S.
Ft./Lt. A. W. Langton	R.A.F. ...	G4MP
Tel. R. F. Laurence ...	R.N.V.(W.)R.	G4BR
Sgt. A. Leitch ...	R.A. ...	G5YA
L.A.C. R. Q. Marris ...	R.A.F. ...	2BZQ
O./A. A. C. Marshall ...	R.N. ...	2AOM
P./O. A. E. Mitchell ...	R.A.F. ...	G8DF
A.C.2 S. McKay ...	" ...	2FTN
A.C.2 C. H. Odle ...	" ...	2BAJ
Sig. J. W. Park ...	R.C. of S. ...	3282
L.A.C. S. Parr ...	R.A.F. ...	G6AN
A.C.2 C. R. Perks ...	" ...	G4CP
Ft./Lt. C. G. Phillips*	" ...	G5PJ
L.A.C. R. A. Pittcock ...	" ...	2CDB
2nd Lt. P. Raban ...	R.A. ...	3581
Ft./Sgt. K. Racombe	R.A.F. ...	SU6KR
L.A.C. J. E. P. Raven	R.A.F. ...	G3HG
L./Tel. J. L. C. Robertson.	R.N. ...	3587
A.C.1 F. J. Rutter* ...	R.A.F. ...	2FMF
A.C.2 B. M. R. Selby* ...	" ...	G4LV
Tel. J. R. Senior ...	R.N.V.(W.)R.	3582
A.C.2 H. R. Stott ...	R.A.F. ...	2AVN
A.C.1 G. T. Studdart* ...	" ...	G2MB
2nd Lt. A. J. C. Threlfall	R.C. of S. ...	2CGY
Sig. W. A. Timbrell ...	" ...	BERS
Capt. G. Twiss ...	Gurkha Rifles	371
L.A.C. D. J. B. Upton ...	R.A.F. ...	VU2KK
L.A.C. L. F. Viney ...	" ...	3106
L.A.C. J. A. Ward ...	" ...	G2VD
A.C.2 J. M. Wheeler ...	" ...	G4JJ
Sgt. L. A. Whalebelly ...	R.C. of S. ...	3352
A.C.1 H. Willets ...	R.A.F. ...	G3HD
Tel. K. Willis ...	R.N.V.(W.)R.	2FPI
L.A.C. R. H. Young ...	R.A.F. ...	G8VR
		2HNH

* Non-Members.

KILOCYCLES TO METRES
CONVERSION TABLES . .

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LETTERS TO THE EDITOR

The Editor does not hold himself responsible for opinions expressed by correspondents

Horizon Distances

DEAR SIR,—With reference to "Horizon Distances" quoted on page 373 of the March issue, I think it would be correct to say the formula given is for *nautical* miles not statute miles.

The difference is not great but as THE BULLETIN is a technical paper it might as well be accurate.

Usual formula for nautical miles is:—

$$\text{Horizon} = 1.23 H.$$

Usual formula for statute miles is:—

$$\text{Horizon} = 1.42 H.$$

Where H = height of observer's eyes in feet from sea level.

Yours truly,

R. KIRLEW (G6KW).

Note.—Comparative figures based on the above information are as follows:—

Height.	Statute Miles.	Nautical Miles.
10 ft.	4.48	3.9
20 ft.	6.34	5.5
30 ft.	7.76	6.7
40 ft.	8.98	7.8
50 ft.	10.02	8.7

Fade-out March 24

DEAR SIR,—As I was listening on the short-wave bands at the time of the magnetic disturbances of March 24, my impressions may be of interest to readers, and especially to those engaged in Propagation investigations.

The S-meter on my receiver is also calibrated in decibels, so that S6 is 30dB, S7 36dB, S8 42dB, S9 48dB, with higher divisions at 54, 60 and 66dB (max.). Normal afternoon readings during the B.B.C. 16.00 G.M.T. news are 66dB, or more, for both 41 metres and 49 metres. On this date, the later signal had a quick flutter around 66dB. After above five minutes the meter dropped to S1 and the rest of the news was unreadable. On 41 metres reception was better, and continued readable at 30dB until the station closed down at 16.30 G.M.T.

At 16.50 G.M.T. Rome was heard on 25 metres at about the same strength, 30dB, but only a few faint signals were logged anywhere else from 10 to 40 metres. Earlier in the afternoon a 16 metre U.S.A. station had been heard. There were also some loud telephony transmissions audible on the 160 metre band. Continental c.w. commercial stations were heard at abnormally low strength, whilst HJV was apparently having trouble in working EAX. During the afternoon, the weather was overcast, no wind, a steady temperature of 52°, and a pressure of 29.73 ins.

From 17.00 to 18.00 G.M.T. Italian and German broadcasts were heard below normal strength between 19 and 49 metres, and at 17.50 G.M.T. the British 25 metre station was wobbly and almost unintelligible (36dB). More remarkable, however, was Cairo on 7,865 kc. which was a good 100 per cent. transmission at 42–54dB for over an hour until 20.30 G.M.T. C.w. signals from XGO and JMO2 were logged during this period, but no U.S.A. signals were heard on any band.

The medium waves were checked during the 9 p.m. news bulletin (20.00 G.M.T.), and here a decided difference from normal was found. The two home service stations, which normally fluctuate from 66dB to 54dB or less with distortion, were absolutely rock steady at 66dB. On the other hand, Bremen which is usually louder and more constant, had sunk to 42dB, which is less than its normal day-time reading.

The following morning it was impossible to receive the 06.55 G.M.T. news from WCBX on 49 metres, although conditions were improving throughout the day.

Yours truly,

Burniston,

Scarborough, Yorks.

L. TRANMER (G6TG).

The B.B.C. Handbook, 1940

The 1940 edition of the B.B.C. Handbook (2s. from all booksellers) will best be remembered for the authentic story it tells of how the B.B.C. prepared for, and carried on, during the war. The technical aspects of war-time broadcasting must of necessity remain a close secret until a later date, but sufficient time has now elapsed for those in responsible positions to record how the Corporation continued to give service to its nine million odd "subscribers." The achievement is well recorded in the chapters entitled "Variety Carries On," "Radio Documentary," "London Calls the World," and "Listening Post 1939" but perhaps the one chapter which interests the radio man more than any other is that contributed by Mr. E. C. Thompson entitled "Au Revoir, Television." In almost melodramatic style the author recalls the scene at Radiolympia and at the Alexandra Palace station when at 12.10 p.m. on the morning of September 1, the fateful signal to close down was received. After mentioning some of the chief television broadcasts of the year Mr. Thompson concludes with a paragraph which every reader of this Journal will endorse "One day, we may hope, all that eager striving band of specialists will reassemble under their queer, futuristic mast in Alexandra Park, to resume the world's first high definition television service."

The B.B.C. Handbook should be read by every listener who has more than a passing interest in Broadcasting—one of the greatest influences in the world to-day.

J. C.

The Candler Company System

Those who wish to improve their Morse speed are recommended to give consideration to the Candler System. The London agent of the Company is Mr. Horace Freeman, Craven House, 121 Kingsway, W.C.2, from whom can be obtained an interesting book of facts.

We understand that many members have written to the London Office expressing their appreciation of this system of Morse tuition.

THE MONTH "OFF" THE AIR—March, 1940

By ARTHUR O. MILNE (G2MI)

Here and There

MANY thanks for the splendid response to the appeal for more reports.

G3JR has received his 100th card and so qualifies for DX.C.C. To work 112 countries in under a year, using only 10 watts, is a remarkable performance. He gives some information on HP1X, who QSL's from Panama. It appears that the only licensed station in that country is owned by the Government official who issues licences! Hence HP1X is very much "under cover." The rig employs 18 watts and the receiver is a SX17. 3JR will forward cards if sent to him in an opaque unmarked envelope bearing a 2½d. stamp.

VU2FO hears a lot of YA2AG, self-excited on 14 Mc. around 12.00-15.00 G.M.T. and thinks he is genuine; in addition PK4 phones, U9's and XU's are very plentiful. SM5KP and VK2AGU in letters to G3RI send 73 to their many friends in G. G8UN says U2NE is still active and quotes LX1GB and PX1B as typical "phoneys" which infest our bands these days. Can anyone supply him with a copy of the March, 1938, BULL. to complete his volume for binding?

A copy of the L.R.M. (Lithuanian) Ham News Sheet just to hand has a page written in English which is to be a regular feature. L.R.M., the national society, is officially recognised and has a membership of 130, 64 of whom are transmitters. The President is LY1J. LY1J and LY1S were with the advance guard of Lithuanian troops which recently occupied the ancient capital of Lithuania, and use was made of their gear until the Vilno station could be repaired. Typical of the Ham Spirit, these two spent most of their spare time trying to locate and assist Polish amateurs still left in the city. All Lithuanian permits were re-issued on January 7 but communication with belligerents is forbidden. The initial licence is for 50 watts but, after two years, this may be increased to 1 kw. on special application.

Can anyone supply the QRA of CS3VA heard several times last year on 56 Mc. by G3YY? G2NJ reports a new German on 7 Mc., D4MMU in Wittenburg.

There seems to be some misapprehension about International Reply Coupons. It has been confirmed that these are still valid to all countries in the Postal Union with the exception of enemy territory.

Post Bag

G8IL, who was able to add another country to his list when the recent batch of cards arrived from Finland, mentions that K6NYD, heard during the A.R.R.L. Contest, was on Johnston Is., working portable. 2FTN has bagged some good 14 Mc. phones, including KA1ME, KA1ZL, K4EMG, CO6MM, CO7CX and any number of LU's, PY's and HK's. The best DX was YN4AE and YN4KV. That's something else we have against you Adolf! Active Europeans include EA7AV, ES1E, ES4G, ES4J, ES5D, LY1J and many Hungarians.

2FJM has heard stations calling OX4C and has logged "VQ2AM." G6QZ adds D4ADF to the growing list of active German stations and has heard many LU's on 28 Mc.

G4FN confirms that poor conditions existed on 28 Mc. from the middle of December until the middle of February, but there have been one or two good days since, although it is badly down on last year. On 14 Mc. the most consistent DX phones have been HI2B and KA1BB with I1IR, I1DD, D4BIU, D4BUF, LY1BD, LY1KK, OK3NZ, OQ5AQ, OQ5IM, TF1B, TF3C, YU7AY, YU7LX, YR5ML, K4ESH, K4FCV, KB6RWZ and CM2WD as some of the good ones, besides dozens of "rare" birds like XZC1A, VZ1AB, AB4X, ZZ3BD and TE5Q! GI5TK remarks on the number of Russians to be heard, especially on 7 Mc., where half an hour produced U2, 3, 4, 5, 6, 8 and 9. D4BIU is also operating on this band.

DX PERSONALITIES No. 10



Franz Bech, HB9CE. Hero of Liechtenstein and Number One European QSL'er.

BRS3724 sends along what he calls his "meagre gleanings"! We only wish we got as much good solid dope from some of the others! He says YV5ACE has been pushing across a fine phone signal on 14 Mc. around 20.00 G.M.T., while W9TUF in North Dakota (2TUF we can't hook him) HI3N, with a YL op, 11JKV, EK1AF, and 11RE are also in prominence. LY1J has been heard calling YJ2FF. Old timer J5CC has been coming in well. 3724 has heard W's on 3.5 Mc. as early as 22.00 G.M.T. NY4AE has been logged on this band in addition to W9ZHT who is on the schooner "Director" in the South Pacific. He quotes W9YIT who supplies information on the Byrd Expedition. Besides KC4USC, the Snow Cruiser, two other stations will shortly begin operations. KC4USA at East Base and KC4USB at West Base. These will be on much higher power than 4USC and should be heard with ease in the British Isles.

SV2S has been heard regularly. He says he is not in Greece, and that he uses an input of 20 watts phone. YN1IP is very active. Just our luck! 2CDT mentions CR7BE, the station of the Radio Club de Mozambique, located at Lourenco Marques on 31.10 metres, which puts in a terrific signal between 19.00 and 21.00 G.M.T. Reports are solicited to P.O. Box 594, Lourenco Marques, Portuguese East Africa. BRS3607 has also been on the watch and has logged XU1B, CO7AS, CX3CJ, K4FCG, HP1A, T12AB and HK4DJ. G4AB has heard 44 states on 7 Mc.

American Commentary

W8OQF has been taken at his word over his offer to correspond with G's. He says conditions have been poor throughout the winter although XU8MI has been coming over well on 7 Mc., local QRM at the Chinese end has, however, prevented a contact. KH6RZQ in Samoa has been the star QSO this month, so now begins the anxious wait for a card.

AC4JS's card has arrived *via* XU4XA but it appears that A.R.R.L. will not recognise it as a Tibetan contact because American Geographical Circles say that Choni is in China. Similar authorities in this country, however, stoutly maintain that it is in Tibet, nearly 50 miles across the border between Tawang and Lhasa, north-east of Bhutan. It looks as if the only solution is to send an expedition to find out just where it really is, equip them with radio so that if it is in China they can walk a few miles further on into Tibet and do the necessary!

KC4USC is on 14330 kc. C.W. and 14150 kc. phone, but 8OQF hopes we don't feel too bad about it! His LX1SS card has just arrived but Ralph reckons this lad is in Belgium. It comes to something when the "phoneys" start sending phoney cards! PZ6ZK, VU2XX, VS5AD and ZD4UC, heard during the "Radio" contest, were all duds in his opinion and he remarks "I can't imagine what pleasure these fellows get out of this kind of thing. I'd as soon listen to myself in a Keying monitor." He has had a letter from Iceland which says that TF5C and TF5M were reported by the local newspapers as suspicious characters. Although their intentions were vindicated, it was just too bad that neither of them was licensed! It would be the only two hams in a rare country who QSL!

W1WV reports an improvement in conditions since the middle of February with PK1XZ, PK1FK,

KAILB, K6MVB and XU8MA all good signals on 14 Mc. He worked NY4AD, on 28 Mc. phone, who gave his QRA as Guantanamo Bay, Cuba. He also mentions that A.R.R.L. banned all European contacts in the DX Contest. He has worked VQ2AM but has no details. 28 Mc. appears to be good for North-South working and has produced LU, XE, CO, HC, K4, HK, CE, K6 and CX on phone. He remarks that, out of 1,134 G's worked, he has 932 QSL's which is a pretty good average.

Dorothy Hall writes us a letter which says so many nice things about THE BULL. and R.S.G.B. that we can but blush and hide our confusion. We'll try to live up to it Lady!

QSL News

G2MI has received his card from KB4FCS, postmarked "U.S.S. Arkansas." This makes 109 countries worked, 109 confirmed. Is this a record? HB9CE sent out over 1,000 cards in connection with his trip to Liechtenstein. Just chew that over some of you non-QSL'ers! Even so, he still lacks cards from more than 20 countries. He promises us one or two more rare countries to work when the present spot of bother is over. Perhaps we'll get a genuine TA at last! VQ5WES offers another card to anyone who has not received one from him. The address is W. E. Smith, Box 81, Kampala, Uganda.

LX1AY tells G3GB that he is convinced that pirate stations are active in Luxembourg and says that out of 1,500 QSL's received at their Bureau last year, 500 were for unlisted calls. G4FN has heard several OH calls since the northern war ceased, but we cannot say yet whether these are genuine.

In order to facilitate the distribution of cards, it would not be a bad idea if organisers of local Hamfests would send a list of those attending, to G2MI. Cards for these members could then be forwarded for distribution at the meeting.

The French QSL Bureau is closed and it is, therefore, regretted that cards cannot at present be accepted for France or French colonies. We are trying to get someone in France to take the job on but under present conditions this is not easy.

Apops of Nothing

First student (as plane falls into a spin): "Quick, what do I do now Instructor?"

Second ditto: "Hell's Bells! Aren't you the Instructor?"

THE ULTRA-HIGH FREQUENCIES.

(Continued from page 415.)

all amateurs interested in V.H.F. work. It is hoped later on to give an account of the practical tests which are being sponsored by the A.R.R.L.

Mr. E. H. Conklin has recently published in *Radio* some invaluable data on the use of short lines for V.H.F. work. It is expected that this article will be reprinted in an early issue of THE T. & R. BULLETIN by courtesy of Mr. Conklin and the editor of *Radio*.

Each month the writer receives very lengthy articles from Mr. Tilson and Mr. Conklin. It is impossible to include very much of the information in these notes, but those who would like to study the articles in detail are invited to write to G8LY.

W1HDQ is thanked for his Air-mailed reports, also W9BNX, SUIRD, G6DH, G8OS, 2AAH, 2AXP, 2BIL, and BRS2817.

THE 28 Mc. BAND

By NELLY CORRY (G2YL)

CONDITIONS during March were very similar to those of the previous month except that West Coast W's were more frequently heard, and a record number of South Americans was reported, thanks entirely to the A.R.R.L. DX Contest. The most outstanding day was March 16; otherwise conditions were at their best during the first week. From March 8 to 13 very little was heard besides a few signals from the Southern Hemisphere, and on March 24 severe solar and magnetic activity obliterated the finish of the DX Contest and caused a wipe-out for several days.

The first Oceanic station to be reported this year was K6JPD, whose c.w. signals were heard by BRS3003 at 18.13 G.M.T. on March 16. Later the same evening W's could be heard working other K6's, but apparently no Asiatic stations were active during the month—in any case nothing was heard of them in Great Britain. From Africa, BRS3003

W5FTA, Mobile Marine in the Gulf of Mexico, and BRS3179 heard XE1CM, XE1CX and XE2FC.

North American signals were fair to good during the periods March 2-7 and 15-19, inclusive, but poor for the remainder of the month. West Coast stations were, however, reported on eight days, and W7ACD was an outstanding signal on several occasions. A casual listener to the band on March 16, 17 or 23 would have been amazed at the sudden increase in c.w. operation, due to the Contest. Probably, more c.w. was heard on those three days than during the whole of the rest of the previous six months!

Nothing was heard from Europe, but G6QZ reports hearing W's call TF1L, who may possibly be in Iceland. The Hissing Phenomenon was heard by BRS3003 for short periods at 15.19 G.M.T. on March 2, at 17.17 G.M.T. on March 11, and at 15.05, 15.16 and 15.17 G.M.T. on March 22.

Reports from VE5ZM, G2XC, G5BM, G6QZ, BRS3003 and BRS3179 are acknowledged with many thanks.

THE ULTRA-HIGH FREQUENCIES

By CONSTANCE HALL (G8LY)

AN endeavour is being made by Mr. E. P. Tilton (WIHDQ) to arrange for some of the American 56 Mc. enthusiasts to transmit *without fail* between 13.30 and 22.00 G.M.T. during weekends, and especially to call CQ on c.w. at the full hours during these periods. If there should be a fortunate combination of "sporadic E" in the right places, we G's might break a record by hearing at least one of these transmissions, nearly all of which will take place between 56 and 58.5 Mc., and mostly no higher than 57 Mc.

On May 11 and 12 an A.R.R.L. U.H.F. Relay Contest is due to take place. The dates have been chosen purposely because this is a period when "skywave DX" is usually giving its first real show for the year. Times are from Saturday, 20.00 G.M.T., until Sunday, 01.00 G.M.T. U.S.A. amateurs are looking forward to a good time on the U.H.F.'s this year, because activity has been maintained in most districts during the winter. Whatever the sunspots have to say about it, it is the number of *active* stations that really counts! WIHDQ is making valiant efforts to encourage the use of C.W. employing it himself whenever the band shows promise of being open in anyway.

Commercial Frequencies

About 25 frequency modulated B/C stations are operating between 40 Mc. and 43 Mc., mostly using commercial network programmes. Transmissions start in the early morning (EST) and go on until after midnight. W2XPS (N.B.C. Television) works on 49.75 Mc. (Sound) and 45.25 Mc. (Vision).

Airways Radio Beams are to begin operating shortly on 75 Mc. between New York and Chicago at 125 mile intervals.

Wide Band Frequency Modulation

The article in the current issue by Mr. J. C. Egerton (G8MU) dealing with the system known as wide band frequency modulation should appeal to

(Continued on page 414.)



heard OQ5AB on March 1, 4, 6, 13-19 and 23, and a new station, OQ5IM, on four occasions.

Thirty-eight different South American stations were heard during the month, and one or two were audible on at least 13 days, though the majority confined their activity to the DX Contest period. Unusual stations logged by BRS3179 were CE3BI, CE3CO, CX1AO, CX1FB, CX2CO, HK4DK, OA4L, OA4U, and others reported were CE2BX, HC1JB, HC1JT, YV1AQ, 13 LU's and 13 PY's.

Central American and West Indies stations were heard on about seven days, and included CO2WM, K4DTH, K4FOW, K5AA, NY4AD and TI3AV. In addition, VE5ZM, now "somewhere in England," heard K4FCV and K4KD; G5BM heard TI2FG and

BRITISH ISLES NOTES AND NEWS

DISTRICT 2 (North Eastern)

Barnsley.—Ten members were present at the meeting held at G6PY on March 20. G5DW, who has left to take a post in Nottingham, carries with him the well wishes of local members.

The next meeting will be held at G2BH on April 24 at 7 p.m.

Keighley.—The T.R. (G8UO) will be glad to hear from anyone in the Keighley, Bingley and Baildon areas as there appears to be a complete "black-out" of amateur activities in these parts.

Leeds.—The Leeds T.R. (BRS.2317) will also be pleased to hear from local members with a view to arranging monthly meetings. BRS.2317, whilst keeping a watch on 28 Mc., has also become interested in the High Fidelity U.S.A. broadcast transmissions. So far four such stations have been logged and three (W5XD, W8XNU and W8XLA) identified. As these stations are situated long distances apart the times of peak reception do not coincide. It is interesting to note the difference in relative strengths at various times. The period 20.00–22.30 B.S.T. seems to be the best for reception. (The Propagation Group of E.S. would appreciate your co-operation o.m.—Ed.)

* * *

The D.R. again appeals for support for these notes, and whilst realising the difficulties which exist he feels that No. 2 is a long way behind many of the other Districts in maintaining social activities. He believes that it should be possible to hold a Northern meeting for Service members similar to the Aldershot meetings, providing a few "live wires" will get busy. How about it you lads in Catterick and York?

G6PY.

DISTRICT 5 (Western)

A representative gathering took place at The Antelope, Broadmead, Bristol, on March 5, when suggestions were made as to future arrangements for meetings. The financial situation was discussed and members came forward splendidly when asked for an increased subscription to District funds. G5UH suggested that those who do not attend should be asked whether they would be willing to pay a small subscription. BRS3106 is now in the R.A.F.

G5JU, who is also in the R.A.F., will be pleased to hear from members. His QRA can be obtained from the D.R.

Cheltenham.—Visitors will be welcomed at the meetings held at 22 Leckhampton Road every Friday at 8 p.m. Code practice and darts help to make the evenings enjoyable.

Stroud.—G5HC reports activity is low because everyone is very busy in other directions. Apart from an occasional informal chat no meetings are being held. Prior to the war a successful club was being run but this has been compelled to close as members have so little time for radio.

G6RB.

DISTRICT 6 (South Western)

We are informed that meetings of an informal nature are being held in Plymouth and Exeter. Any members living in or passing through these towns should look up the T.R.'s. They will be heartily welcomed. The D.R. has had visits from G2CI, 2FP (on leave from France), 2DYM, and BRS3487. The last mentioned brought along his new test gear and several interesting hours were spent investigating it. 2DYM is now doing radio work in Plymouth. BRS3171 has joined up as a radio mechanic. G5SY.

The First War-Time MIDLANDS Provincial District MEETING

will be held at

THE HOPE AND ANCHOR
Edmund Street - Birmingham

on

Sunday, April 28, 1940

Assemble	12 noon
Lunch	1 p.m.
Technical Talks	2 p.m.
Brief Business Meeting	4 p.m.
Tea	4.30 p.m.

Inclusive Charge 5/-

***All Reservations to :—Mr. V. M. Desmond,
G5VM, 199 Russell Road, Moseley, Birmingham,
not later than April 21, 1940.***

DISTRICT 7 (Southern)

Aldershot and Farnborough.—Once again we record our indebtedness to Bill Wadsworth (VE5ZM) and Jim Kirk (G6ZO) for arranging another Ham Gathering for the Services on March 17. This time we were pleased to see "Clarry" and "Ham" Whyte, the former ever with an eye to business was seen to be "selling" the Society to the VE's and went off well pleased bearing a sheaf of completed membership forms!

Elsewhere in this issue will be found details of the next of these gatherings at which we are to have a display of the 1938 R.S.G.B. films. All are welcome. If you are in the Services do not forget to let anyone know, who does not see the "BULL."

Portsmouth and Southsea.—Since these notes were

written before the monthly meeting it has not been possible to contact the majority of the local members, consequently, notes are sparse. BRS3751 is welcomed to membership, G8BD is now an L.A.C. in the R.A.F.V.R. The T.R. would welcome reports of individual activity.

Croydon.—The Surrey Radio Contact Club continues with its successful activities. The Society's monthly magazine "QRX" maintains its early promise although now dressed in a natty blue cover. A perusal of its "libellous" remarks seems to indicate that the colour was well chosen!

Forthcoming Events

- | | |
|----------|--|
| April 20 | District 13, 3 p.m. at Brotherhood Hall, West Norwood. |
| " 20 | District 15, 3 p.m. at G5LN, The Excelsior Hotel, 1 and 2 Ladbroke Gardens, Ladbroke Grove, W.11. |
| " 21 | Scotland "A" District, 2.45 p.m. at Y.M.C.A. Residential Club, 100 Bothwell Street, Glasgow. Talk by J. Emmerson (GM8HA). Subject: "Ham Aerials." |
| " 21 | District 8, Reunion Meeting, 3.15 p.m., at The Waffle Café, Petty Cury, Cambridge. |
| " 21 | District 7, Ham Gathering at Y.M.C.A., North Camp, Farnborough, 2 p.m. Tea at 3 p.m., followed by a display of R.S.G.B. films. |
| " 23 | District 14 (Southend Section), 7.30 p.m. at G2GU, "Filby," 65 The Fairway, Belfairs, Leigh-on-Sea. |
| " 26 | London Meeting, 5 p.m. at Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. Trade display by Automatic Coil Winder, Co., Ltd. Charge 1s. |
| " 28 | Midlands Provincial District Meeting, 12 noon, Hope and Anchor Hotel, Edmund Street, Birmingham (see separate announcement under District Notes). |
| " 28 | Scotland "H" District, 3 p.m., at GM4AN, 3 McKenzie Street, Kirkcaldy. |
| May 7 | District 5 (Bristol Section), 8 p.m., at The Antelope, Broadmead, Bristol. |
| May 26 | District 12, "Garden-Party" at G6LL, "Woodlands," Tolmers Road, Cuffley, Herts. |
| June 2 | District 14, P.D.M. at Chelmsford. |

The Annual General Meeting was held on March 3, preceded by a Morse test. G4NG has been promoted to L.A.C. and hopes to meet some of the local members during his forthcoming leave.

Reading.—Welcome to 2ARA who has now come to live in Caversham he hopes to contact any of the locals who are remaining in the area.

Woking and Weybridge.—The attendance at

recent meetings seems to have suffered owing to the counter attraction of the Ham Gatherings at Farnborough, but they have, in spite of the small numbers, provided pleasant occasions for rag-chewing. Congratulations to G5YA who has been promoted to Sergeant. G5WP.

DISTRICT 8 (Home Counties)

The D.R. is particularly grateful to those members who have written in with such items of news as are available, thereby helping to keep the flag flying.

A District re-union will be held at the Waffle Café, Petty Cury, Cambridge on Sunday, April 21, at 3.15 p.m. This will be in the nature of a social and informal rag-chew over a cup of tea. Service members in the area will of course be welcome—let's make it a bumper success.

Cambridge.—That will o' the wisp, G2XV, has been located at last. The Tobe has been removed from shack to fireside for listening comfort, and a mere score or so years on the air has failed to damp Gerry's enthusiasm. 5JO's workshop is now almost complete, he proposes to construct test gear, and a 56 Mc. converter for the H.R.O. 5DQ was to register for military service this month. 5DR is building a service meter, and 8SY a C.R.O. 2DT, now back in Cambridge, has recently lost his mother. We offer our condolences. He is adding a pre-selector to the Sky Champion. Would 8FF please report whereabouts?

Peterborough.—G2NJ advises that DLE/DLC, the powerful C.W. German station which is responsible for a daily trans-ocean news service (sent in English) on approximately 30 metres, was greatly affected by the magnetic storm at Easter. This station has been received at enormous strength daily by 2NJ for months, but on the days in question, particularly the Monday, it was barely audible.

March.—In an interesting letter G3WW praises the R.M.E.70, and he has certainly tried most of them. To his numerous other duties he now adds that of Under Sheriff for Cambs. and Hunts. (Suggest you experiment on "that man" O.M.)

Bedford.—No news. How about it boys?

Luton.—Congratulations to the T.R. G3KG, who was married on March 9. The new QRA is 26, Farley Avenue, which is, he says, on the top of a hill with a N.S. garden. He would like the loan of a Tobe instruction book—can any member oblige?

St. Ives.—G4AZ pays tribute to Percy Murden, BRS3379, who has given him valuable guidance with regard to the study of astronomy. We understand that 8ST now works in Coventry, but was staying with 5RL at Easter. 6DX was recently on leave from the R.A.F., and visited 5JO.

Finally—save those Petrol Coupons for April 21. G5BQ.

DISTRICT 9 (East Anglia)

It is hoped that suggestions regarding the proposed District Meeting will be made in time for inclusion in the May issue. Sunday, May 26, is the projected date.

Norwich.—G2UT's son, who is a ship's wireless operator, has been visiting some of his father's "contacts" in "W." G5IX has been home on leave. 2CPL of Lowestoft, who is in the R.A.F. as radio mechanic, is to be congratulated on the arrival of a second "junior op."

King's Lynn.—G2XS has been pleased to receive visits from 5JU and 4PA who have been stationed locally. He hopes shortly to see 8IJ.

G2XS.

DISTRICT 10 (South Wales and Monmouth)

District 10 members will be glad to hear that our D.R. GW5FI has recently returned from "places unknown" for duty in London. He asks us to convey his good wishes to all old friends.

Cardiff.—Several local members are constructing frequency meters and other auxiliary apparatus, a sure sign that the area is still very much alive.

At the March meeting, held at GW8WU, a goodly number of members attended to discuss matters of mutual interest. Mrs. 8WU is thanked for providing an excellent repast.

The April meeting will take place on the 21st. Further details are available from the T.R., Mr. H. H. Phillips, GW4KQ, or from the Scribe G5FN (Cardiff 7924, Ext. 20).

Other Areas.—It is regretted that no news is to hand from Newport, or Swansea. An appeal is again made for a short monthly report. G5FN.

DISTRICT 11 (North Wales)

A very successful meeting attended by 16 members took place at GW6AA on Easter Sunday. The D.R. was particularly pleased to welcome G2JT, 3CK, and 6DP from District 1.

An ingenious midget 1-v-1 receiver, with an R.F. stage peak tuned to 14 Mc. was demonstrated by 2 JT. Although this measured only about 5 in. \times 5 in. \times 3½ in., DX stations were received at amazing strength on a short indoor aerial. 6OK brought along a Millen "Hetrofil," which is used with great success in conjunction with his HRO receiver. Details of this device have appeared in past issues of QST, and it appears to be well worth constructing, particularly for those still using TRF receivers.

An indexed system for filing QSL cards was shown by 6AA. The present lull in our activities, provides a splendid opportunity for preparing such an index covering the pre-war period. What a good thing it would be to enter a new era in which QSL cards were no longer childish and crudely stuck on our station walls!

In order to keep the flag flying, a decision was made to hold meetings approximately every three months. The next two will take place on June 16, and August 4. The latter has been arranged to coincide with August Bank Holiday so that members home on leave may attend. Times and places will be announced later under "Forthcoming Events."

All members in North Wales send their best wishes to those from District 11 who are away with the forces. They were much thought of, and talked about, at our last meeting, and we look forward to the day when a mass re-union can take place. GW6AA.

DISTRICT 12 (London North and Hertford)

News is scarce this month due mainly to the fact that the District meeting was held after press date.

A party of six attended the South London high tea held at Kennington last month and thoroughly enjoyed themselves. G6QM upheld the prestige of North London by winning a prize in the competition.

We were pleased to see G3GX home on leave from France recently. He was looking well and reports that G2VD, 5NM, 5CW, 6FI and 8GC are also stationed with him in the R.A.F. Our D.R. (G5QF) was at home for Easter and continues to make progress.

Members in the Watford area will be sorry to hear that Mr. C. E. Adams (BRS3412) has had to go to the Royal National Hospital, Ventnor, Isle of Wight, for sanatorium treatment. He will be glad to meet any amateurs in that area for a "rag-chew" or a game of chess. We wish him a speedy recovery. In his letter he tells us that BRS2008, who he recently met, is doing radio service work in the Army.

Friends of Peter Modridge, G6FM, will be glad to hear of his recent marriage to Miss Evans of Kenton. G3LT, 4KD and 3HT were present to assist in the send-off. G6FM is now operating at a G.P.O. coast station.

G5FA.

DISTRICT 13 (London South)

An apology is due for the absence of notes last month. The D.R. was unfortunately ill in bed and it was found impossible to get them to H.Q. in time to go to press. We trust that this will not occur again!

Last month's "high spot" was the meeting and tea held at The Horns, Kennington, on March 16. This event which had been looked forward to by everyone, turned out a great success. Among the visitors, present were G6NF, 6CL, 6LL, 5FA,

AN INFORMAL LONDON MEETING

will be held on

FRIDAY, APRIL 26th

at the

**Institution of Electrical Engineers
Savoy Embankment**

Display of measuring equipment arranged
by Messrs. The Automatic Electric and
Coil Winder Co. Ltd.

Charge 1/-

5 p.m. — 8 p.m.

6QM, 2YD, 2MI, 8IG and VE3IM. After tea the D.R. welcomed everyone, making special reference to those members of H.M. Forces who were present. Our Secretary, G6CL, then delivered an informative speech in which he dealt with the work of the R.S.G.B. in war-time. He spoke of the importance of keeping the Society alive and of the interest and pleasure that service members who are amateurs derive from R.S.G.B. activities.

Our Vice-President, G6NF, paid a warm tribute to G6CL and his "staff" (Miss Gadsden and Mrs. 6CL) for the very hard work which they are putting in on behalf of the membership and referred to the enormous amount of time they devote to the task of keeping in touch with members in the fighting services. VE3IM followed with an interesting description of conditions in Toronto, Canada, and remarked that as the majority of the amateurs there were youngsters they could not all afford to purchase communication receivers. This brought an answer from the D.R. to the effect that amateurs in this country were by no means all millionaires, and that many of them still had not acquired such receivers!

A cinematograph show was then given by Mr. Gray, who had very kindly come along as operator. It may interest members to know that Mr. Gray, although not at present in possession of a transmitting licence, once held an Australian call sign. The film shown was one dealing with Allenby's campaign in Palestine during the last war and the pictures were actually taken on the spot by the War Office.

Finally everyone took part in an "Advertisement" competition organised by G2JB and 8TN. This proved very entertaining and much discussion was heard as to the identity of a certain lady in a bath—the subject of one of the advertisements! The prize winners were G3TG and G6QM with G3SH collecting the booty.

We should here like to record our sincere thanks to G2JB and 8TN on whose shoulders rested most of the arrangements, and to Mr. Gray.

Owing to the absence of notes last month it was not recorded that at the February meeting, Mr. Voigt kindly came to the Brotherhood Hall to give a lecture and demonstration. So interesting did this prove that the meeting was not adjourned until 7 p.m. some two hours later than usual. We hope to have more of these talks in the future and the D.R. would welcome any offers or suggestions.

The next meeting is to be held at West Norwood on April 20.

G2WV.

DISTRICT 14 (Eastern)

The high spot of the month is an announcement from the Chelmsford group that the Easter P.D.M. is to be held in their town on June 2. Full details will appear next month, meanwhile the D.R. and all members resident in the county town invite you to keep free the above-mentioned date.

In selecting Chelmsford as the venue for the meeting the organisers had in mind the fact that many service members stationed in the Essex, Herts and Cambs areas, would probably be able to attend without undue difficulty as the town is well served by bus services.

It is hoped that the meeting will prove that war or no war you can't keep a good ham down!

Chelmsford.—Mr. R. L. Varney, G5RV, in reporting the P.D.M. arrangements advises that morse practices have taken a firm hold at local meetings. Among those active are G5CA, 6LB, 8GV, BRS3650 and the T.R. himself. G2SA reports cobwebs on his receiver, but 5RV is to help him dust them off! G5KA now stationed in Malta sends an amusing letter to 5RV. (Good luck KA.—D.R.)

Southend.—It is with some regret we have to report that our old friend Cyril Greenaway, G2LC (who until recently was T.R.) is leaving the area to take unto himself a wife. Members throughout the District extend to both G2LC and his lady their best wishes for the future and the local group in particular hope they will often have an opportunity of meeting them in person or on the air.

G2SO, who is acting as T.R., was pleased to see Max Buckwell, G5UK, when home on leave from the R.A.F.

An attendance of eight was recorded at the meeting held last month at G4GT (Rochford).

Ilford.—A meeting attended by G2CD, 8SK,

8TL, 2RR, 6HU, 6AH, 2BRH and 2XP was recently held at the QRA of 2BRH when activities under war-time conditions were discussed. G2RR reported having built a resistance-capacity test bridge with a magic eye indicator, whilst 2XP stated he had been conducting receiver experiments on 56 Mc. and above. G8SK displayed his famous film "Ham Radio."

It is evident from the enthusiasm shown at these meetings that the local group are determined to keep the spirit of amateur radio very much alive.

Elsewhere.—G6UT was recently visited by G8AB when on leave. Other visitors will be welcomed at any time by the D.R.

Memo.—Book June 2 now. Thanks. G6UT.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

Only 15 members attended the March meeting, which was rather disappointing as we had anticipated a large attendance following the news of our first meeting reported last month. G2MQ opened a lively discussion on super-hets and pre-selection. A further collection was made to the cigarette fund. Cigarettes are being sent to G5ND, 8FV and 8PI and we hope they will enjoy them.

The morse class inaugurated at the last meeting is progressing well. G2TJ, who is at present instructing, would welcome offers of help, whilst any members wishing to join the group should contact Mr. F. W. Fletcher (2FUX), 42 Mount Avenue, Ealing, W.5, for details. Mr. G. F. Eglesfield (2CLL), 60 Buckingham Avenue, Feltham, Middlesex, is also willing to give morse instruction to any members living near him. He would welcome visitors on Sundays (morning or afternoon) and most evenings. 2FUX is also "at home" to visitors on Friday evenings and Sunday mornings.

Members who join the Forces or who have already done so are asked to notify the D.R. of an address to which letters may be sent. Home members are asked to forward any service addresses which may come their way.

The following members are known to be serving overseas: G3MA, 4IG, 5ND, 8FV, 8MK, 8PI, 2CWR and 8VM (who is in the merchant navy), while G3GY, 3MI, 3XI, 4AR, 4PA, 5CV, 8FA and 8WR are believed to be "somewhere in England."

A welcome is extended to 2CLL and BRS3718 who have joined the Society.

High Wycombe.—G8VZ reports that 3MI whilst on leave attended a meeting at G6JK on March 3. 2BAO has left the district for Birmingham. We wish him success in his new post. The monthly meetings on Saturday afternoons will soon be resumed.

BOOK THE DATE NOW

JUNE 2, 1940

**EASTERN PROVINCIAL
DISTRICT MEETING
CHELMSFORD**

West London and Middlesex.—2FUX, who has constructed a frequency meter and 100 kc. standard, contemplates building a C.R. Oscillograph. BRS3718 has the latter already and would exchange television knowledge for code practice. 6WN is constructing a frequency meter, whilst 2CLL is listening to what is left on 7 and 14 Mc. !

G6WN.

DISTRICT 16 (South-Eastern)

There is a regrettable lack of reports this month, G3WR being the only T.R. to send in any account of local activities. He expresses the view that the absence of district notes may give the impression that there is a lack of interest among the members and so have a bad effect when the time comes for the re-issue of licences. One could wish that more T.R.'s shared this sentiment for although there is probably as much interest as ever amongst members, both at home and abroad, there was never a greater need for its expression through the medium of THE BULLETIN. Will each T.R. please endeavour to send the D.R. a few lines by the 25th of this month?

Brighton and Hove.—At the meeting held on the first Thursday of March, sixteen members and friends were present, including G4GQ (Berkhamsted) and G8DG (Acton,) who were welcomed by the chairman.

A talk given by Mr. Fairchild (G3YY) on 56 Mc. work, included details of his peace-time gear and the results obtained. The talk was greatly appreciated and many questions were addressed to the speaker.

Members are still spending a good deal of time at their receivers and the building of pre-selectors is under discussion.

The meetings on the first Thursday in each month are being continued at the Imperial Hotel, Queens Road, Brighton and visitors are very welcome. The T.R. who would appreciate more reports from individual members had the pleasure of a visit from G8AC while the latter was home on leave.

G2WS.

DISTRICT 18 (North and East Yorkshire)

Hull.—G8UL has received a letter from Signalman A. G. Dunn (G3PL), who returned to England to enter hospital. Letters may be sent via G8UL. All members wish him a speedy recovery.

G3CC, of Keyingham, has visited India as a ship's operator. 5JD is with the R.A. 6OS is still in Hull but has little time for amateur radio. BRS3592 is experimenting with time base circuits on his cathode-ray tube.

The above news reaches us from G8UL who is acting as T.R. until an appointment is made.

Scarborough.—G2TK, who has been accepted as a civilian radio operator by the Admiralty, expects to be leaving the town shortly. 2DDA and 6SO have registered under their age groups, but no further details are yet available.

York.—Hearty felicitations and good luck to R. W. Hall (BRS3527) who entered married life at Easter. He is keenly interested in flying, and hopes to join the R.A.F. when called up.

General.—The D.R. would be glad to receive photos of District members in the Services. So far one has arrived from G8KU, but as it was apparently taken on a bathing expedition in the tropics, it

was not suitable for THE BULLETIN and will be handed round locally instead.

G5MV via G6TG.

Scotland

News is still scarce and reports are to hand from only two districts.

"A" District.—There was an excellent attendance at the March meeting when Mr. D. Macadie (GM6MD) brought along his midget pre-selector and converter for 28 and 56 Mc. He talked to a most appreciative audience judging by the discussion which followed and also by the interest displayed in his fine workmanship. At the meeting to be held on Sunday, April 21, Mr. J. Emmerson (GM8HA) will give a talk on "Ham Aerials." Members will be interested to learn that it has been decided to carry on these meetings during the summer months and in this connection it is hoped that as many as possible will support them. Jim Stove (GM5ZX), who has left the district to take up an appointment in England, carries with him our good wishes. We were glad to see L./Cpl. Bulloch, R.A., at the meeting.

"H" District.—After a period of no news, the silence has been broken with a very welcome and long report. The District held its first meeting on November 26, 1939, at the home of the D.O. After some discussion it was decided to give up the District Shack for the "duration." As a result the District subscription has been reduced to 2s. 6d. The second war-time meeting was held on February 11 at GM4FK, when nine members were present, including GM3UU and GM3XO from Cupar and GM3ND from Crieff.

Meetings will take place in future on the last Sunday of each month at 3 p.m. at the homes of various members. The next will be on April 28 at Mr. W. G. Hopcroft's house, 3 McKenzie Street, Kirkcaldy, and the following on May 26 at Mr. W. Anderson's home, 48 Rosslyn Street, Kirkcaldy. Notifications of future meetings will appear in THE BULLETIN. "H" District once again loses another stalwart from its ranks, this time in the person of Mr. J. Gouck, whose occupation now takes him to Dundee. The membership wish to thank him for his past talks at meetings and wish him good luck in the future. The following members are known to be on active service: GM3LG, 3ND, 3SW, 4MQ, 6JJ, 8MQ, 2APA, 2AVN, BRS379 and 3294.

Mr. G. Mortimer, GM3GG, asks us to mention that he has not enlisted as was reported in our February notes. GM3GG is holding an appointment at a G.P.O. Radio Station.

GM6ZV.

An Invitation

Mr. B. A. Matthews, G6CC, 20 Hesketh Crescent, Erdington, Birmingham, 23, will be glad to accommodate any amateur who arrives in Birmingham the day before the P.D.M. which is fixed for April 28.

G6CC will also be glad to extend hospitality to any overseas amateur should he be stranded in the Birmingham area. Phone, Erdington 0268 or Aston Cross 3380.

The Measurement of Radio Frequencies

Part II of Mr. O'Hagen's article will appear in the May issue.

ELECTRADIX

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We can supply the cheapest efficient Chargers



A.C. MAINS CHARGERS. Leadix Tungars. Two models of these famous Chargers can be supplied at specially low prices. No. 1 for D.C. output of 70 volts 6 amps with meter and controls will handle 100 cells a day. Cost only £7/17/6. No. 2 is a fine Tungar Charger arranged for 70 volts 10 amps in two 5 amp circuits with meters and variable volt controls for handling 200 cells per week for £12/15/6.

PHILLIPS CHARGER, Model 1087, for 24 volts 10 amps. in steel case. Complete, £7/10/6.

DAVENSET, Type ASC4. A circuit charger for up to 80 cells on at once. Has four sets of autocharge regulators for four circuits of 1 amp., 1 amp., 2 amps., and 2 amps., or one of 50 volts 6 amps. In fine steel cabinets listed at £32 is for sale at £14/10/6.

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Model N/A6, 200/250 volts A.C. and D.C., 6/8 volts 1 amp., 17/6.

Model N/B6, 200/250 volts to D.C., 6/8 volts to 1 amp., 24/6.

Model N/C6, 200/250 volts D.C., 6/8 volts 2 amps., 37/6.

Model N/D12, 200/250 volts to 12 volts 1 amp., 38/6.

Ditto, 12 volts 2 amps., with 6-volt tap, 65/6. 5 amp., £4/17/6. And many others.

SHELTER CHARGERS, with automatic switchgear for large batteries.

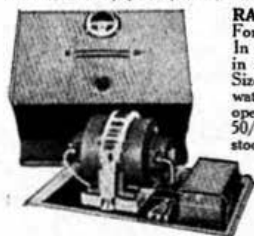
ACCUMULATORS for H.T. at 6d. per volt; 3 amp. hours. In 24-volt unit crates, glass cells, 12/- each. Can be parallel charged off 12 volts.

New C.A.V. 6 volt Accumulators, 3 cells, 18/36 amp., non-spill, celluloid Govt. wood case lid and strap, 10/6. Single cells, 3/6 each.

KEYS. We have now a number of ex Beaton ship-keys and some of the G.P.O. type with switch, all complete, with contacts but soiled.

HAMS should do a bit of Scientific Research if their keys are silent. See BULLETIN for February for some useful apparatus.

You can also use your D.X. Receiver for Morse Recording with G.P.O. type inkers, on mahogany base with tape reel under, in first-class order, £6. Lightweight French Army Field Morse Inkers, fold up into wood case, £7/10/6. Super Model Army G.P.O. Field Morse Inker, brand new, entirely enclosed, every refinement, indicator, reply key, tape container, etc., £8. Mahogany Tape Container, G.P.O., desk top paper reel in drawer, cost 40/6, for 3/6 only. Morse Paper Reels, 8d.



RADIO ROTARY CONVERTERS. For A.C. Receivers on D.C. Mains. In silence cabinet with filter. All sizes in stock from 15 watts to 1,500 watts. Sizes: 15, 30, 50, 100, 200, 400 and 800 watts; 1 kw., 1½ kw., etc. Also battery-operated models for 12/230 volts and 230 volts. All as new, delivery from stock.

STATIC CONVERTERS. A.C. to D.C. 40 watts output, steel cased. Input 230 volts A.C. 50 cycles, output 440 volts, 60/100 m.a. D.C., with valves, 45/6.

500-CYCLE ALTERNATORS, 200-watt Self-exciting Alternators. Type 52A. The most perfectly made A.C. generator used, gives 500 cycles 10 volts 20 amps., weight 7½ lb. in aluminium cover. Belt or motor drive, and fully guaranteed. With a 25/- transformer, H.T. voltage up to 3,000 volts may be obtained. Cost £30, and are given away at £23/10/6 cash with order.

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"I am making very good progress with the course which is most interesting and clever, and I wish you every success."—C.W.

"I think the Junior Code Course a very sound idea, and, would commend it to anyone who is thinking of taking up any form of communication in the forces or government service."—E.M.C.

"My CW is now better than ever it was and can manage to take 16-17 w.p.m. Have just received lesson 5. If the improvement continues at the present ratio, I'll be doing 30 w.p.m. by the time I get lesson 10."—W.G.

"I have been making steady progress with the Course. I am now, with a little concentration, able to receive code at a speed of 20 to 22 w.p.m. My sending speed is about 20 w.p.m."—A.T.

"Congratulations, and my very best wishes to the new student, he is taking the right road to success."—D.R.

"I am satisfied that your Course is good and if your advice is followed faithfully the result must be a good trained operator."—W.W.

NOTE. The original letters from which the above extracts have been taken, may be inspected on production of this advertisement.

JUNIOR Scientific Code Course for beginners. Teaches all the necessary code fundamentals scientifically.

ADVANCED and High-Speed Telegraphing Course for operators who want to increase their w.p.m. speed and improve their technique.

TELEGRAPH TOUCH-TYPEWRITING for those who want to become expert in the use of the typewriter for recording messages.

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HEADQUARTERS CALLING

London Meetings

The March meeting was attended by about 40 members, who had the pleasure of listening to a most informative lecture, given by Mr. E. A. Dedman (G2NH) on "Recent Developments in the Manufacture of Quartz Crystals." A special display showing manufacturing processes was a special feature of the meeting.

The next meeting will be held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment on Friday, April 26, when Messrs. Automatic Coil Winder Co., Ltd., will arrange a trade display. A charge of 1s. a head will be made to cover the cost of refreshments and hire of rooms.

Members are invited to forgo together from 5 p.m. onwards for informal discussion. Tea will be served from 6 p.m. to 6.30 p.m.

A.R.R.L. and Radio Ltd., Publications

Orders can now be accepted for the American publications listed below. On receipt of orders, the R.S.G.B. will advise the A.R.R.L. and Radio Ltd., who will in turn despatch the publications *direct to members*. It must be appreciated that a delay of several weeks will occur between the time an order is received by the Society, and the delivery of the goods in Great Britain.

The following are the current prices for those publications which the Society is prepared to handle:

A.R.R.L. (1940) Handbook ...	7s. 0d.
A.R.R.L. Antenna Handbook ...	3s. 0d.
Radio (1940) Handbook ...	8s. 6d.

Radio Ltd. advise that their Antenna Handbook is now out of stock.

A.R.R.L. (QST) Subscriptions

Due to the alteration in sterling exchange, the annual A.R.R.L. subscription rate is now 15s. per annum. Members who have, in the past, subscribed direct to the A.R.R.L. or have purchased copies of QST from booksellers would be well advised to pass their renewal instructions through the Society in view of the present difficulty of sending money out of the country.

"Radio" Subscriptions

Members who wish to obtain *Radio* the West Coast U.S.A. technical Journal may forward their subscriptions direct to Headquarters. The subscription at the present rate of exchange is 17s. 6d. for one year or 30s. for two years.

Situations Required

It frequently happens that Headquarters are asked by representatives of Government departments and commercial concerns, for names of members seeking employment. Those who are out of employment are invited to advise the Secretary-Editor so that he may be in a position to pass on their names if an opportunity should occur.

Correspondence should be marked "Personal" and brief details given of past experience and other essential information.

Kilocycles-Metres Conversion Tables

Copies of this very useful 64-page publication, in vest pocket booklet format, are available from Headquarters, price 1s. 3d. each, post free.

Members Notepaper

Members Notepaper is now available in packets of 100 sheets at 3s. per packet, post free, or two packets for 5s. 9d.

Service Members

Members in H.M. Forces are urged to arrange for THE T. & R. BULLETIN and other Society correspondence to be sent to their home address. Providing re-direction is made without delay no extra stamp is required on the wrapper or envelope.

Civil Defence

Members engaged on A.R.P., A.F.S., or other *Local Government* work of a civil defence character, are invited to send brief details to Headquarters, for record purposes only.

The following particulars are required: Name, Branch of Civil Defence, Call Sign or B.R.S.

Back Issues of "The T. & R. Bulletin"

In past years members have allowed their subscriptions to lapse for several months and then asked to be brought up to date. This has generally been possible, but under present conditions, we cannot load Headquarters with big stocks of back issues on chance.

Members will greatly assist by renewing their subscription promptly thereby making sure that their copy of THE T. & R. BULLETIN arrives regularly each month.

Technical Information

Attention is drawn to the facilities offered by the General Post Office in the supply of technical information on the many phases of telecommunication engineering covered by the Post Office Engineering Department.

All technical information for the use of the Post Office staff is embodied in a series of loose leaf sheets known as "Engineering Instructions" which vary in size from 1 to 20 or more sheets, according to the subject treated, and the majority of these are available to the public at a flat rate charge of 1/6d. per printed page, i.e., 1d. per sheet, printed on both sides.

It is thought that many members serving with H.M. Forces who may have made the acquaintance for the first time of such things as teleprinters, automatic telephone systems, V.F. and carrier systems, etc., will be glad to avail themselves of this service.

All enquiries should be addressed to:—

The Engineer-in-Chief,
Equipment Branch (Consultative Services),
Room 9, 4th Floor,
Alder House,
Aldersgate Street, E.C.1.

Returned Bulletins

Readers are asked to assist us in tracing the present whereabouts of the following members who have moved from the address given below without advising Headquarters:—

H. F. Briggs (G4GF), 74 Westborough, Scarborough.

S., Sgt. H. W. Care (BRS3636), 9 Section, R.A.O.C.
L. A. Cope (BRS2751), "Burwood," Channel View Road, Woodingdean, Brighton.

K. Goldberger (FRS47), c/o E. W. Coleman, Orchard Estates, Lancing.

L. Hardie (2FHH), 530 Holborn Street, Aberdeen.
Major H. G. Pargeter (BERS29), 44th Divisional Signals.

F. T. S. Smith (G6FK), 1 Swan Bank, Penn, near Wolverhampton.

R.S.G.B. Philatelic Section

It is proposed to re-start this section which was brought to a standstill by the outbreak of war. Will all those who are stamp collectors and would be interested please write to Mr. A. O. Milne, G2M1, 29 Kechill Gardens, Hayes, Bromley, Kent, or phone Hurstway 1877.

Smithsonian Institution

Copies of three new Smithsonian Institution publications recently issued from Washington are available on loan from Headquarters. The subjects covered are "Cosmic Radiation" by P. M. S. Blackett, M.A., F.R.S., Professor of Physics, Birkbeck College, University of London, "The Sun and the Atmosphere" by H. T. Stetson, Massachusetts Institute of Technology, "Science and the Unobservable" by H. Dingle, D.Sc., R.C.S., Professor of Natural Philosophy, University of London. These publications are extracted from the Smithsonian Report for 1938.

Television Society Journal

The current issue of the Journal of the Television Society contains important contributions on The Orthicon (a new Television pick-up tube), Analysis and Design of Video Amplifiers, Synchronisation of Scophony Television Receivers, and a description of the Pulse Generator used by Scophony.

The Journal is issued free of charge to members of the Television Society whose Headquarters are now 17 Featherstone Buildings, High Holborn, London. Details of membership can be obtained from the Hon. Gen. Secretary, 17 Anerley Station Road, London, S.E.20.

DX Century Club Claims

Shortly after the outbreak of war Headquarters approached the A.R.R.L. with a view to obtaining their agreement to the Society examining claims for their DX Century Club certificate. In making their enquiries Council pointed out that Home members might be diffident about risking the sending of cards to America.

The A.R.R.L. has advised the Council that it is unable to agree to their suggestion, but they intimate that they are prepared to accept photostat copies of cards.

The DX Century Club certificate is issued by the A.R.R.L. and not by the I.A.R.U., therefore it

would be unfair to compare the handling of claims for this award, with claims for the W.A.C. certificate which is issued by the I.A.R.U.

Claims for W.A.C. certificates can still be submitted via the Society.

A Welcome awaits All Visiting Amateurs

Arrangements have been made to post notices in the Beaver Club and Victoria League Club, London, inviting overseas amateurs serving with H.M. Forces, to get in touch with R.S.G.B. Headquarters. THE T. & R. BULLETIN is also on display at both Clubs and it is hoped by these means to contact many of our Empire friends.

We would ask Home members to keep us informed of the whereabouts of Empire amateurs who are in England, so that we may be given a chance to get in touch with them. Further, we ask all Empire members to make a special point of seeing that someone in each contingent leaving their native land carries with him the name, address and telephone number of R.S.G.B. Headquarters.

New Members

HOME CORPORATES

- T. VICKERY (G2VI), 29 Millfield, Folkestone, Kent.
A. W. RYLEY (G4NX), 135 Hollywood Lane, Hollywood, Birmingham.
T. SMITH (G15ZY), "Blair," York Avenue, Whitehead, N.I.
I. P. MACKAY (G5AY), 6 Kennersdene, Tynemouth, Northumberland.
E. D. REDGMENT (2AIF), 35 Lovendge Avenue, Chanterlands Avenue, Hull.
W. NICHOLSON, Jr. (2AYH), Camnick House, Brisco Road, Carlisle, Cumberland.
M. A. PYLE (2BLA), 61 Denham Avenue, Llanelli, Carmarthenshire.
N. HORROCKS (2CUZ), 32 Sandbrook Road, Ainsdale, Southport.
W. R. GRIMES (2FAA), 92 Rugby Road, Hinckley, Leicester.
H. WILLETS (2FPI), 1 Moorfield Grove, Tongue Moor, Bolton.
S. EYRE (2FZU), 48 Lower Stanton Road, Ilkeston, Derby.
F. M. BOWD (BRS3750), 67 Hawthorne Avenue, Long Eaton, Notts.
J. B. WOOD (BRS3757), Highfield, Belgrave Close, Chelmsford, Essex.
J. E. HARLEY-MASON (BRS3758), 5 Mount Park Avenue, S. Croydon.
H. N. GANT (BRS3759), (Royal Navy).
A. F. D. GIDDY (BRS3760), 99 Greenham Road, Muswell Hill, N.10.
A. BRYCE (BRS3761), 278 East Park Road, Leicester.
E. C. FISHER (BRS3762), 151st Coy. O.C.T.U.
K. E. PHILLIPS (BRS3763), 139 High Street, Marlborough, Wilts.
D. H. PRIOR (BRS3764), 156 G Block, Guinness Buildings, Lever Street, E.C.1.
S. S. LOVEWELL (BRS3765), County Police Station, Swaffham, King's Lynn.
J. D. BAKER (BRS3766), 56 Elsie Road, Southtown, Great Yarmouth.
T. W. FLAVEL (BRS3767), 22 Hermiston Avenue, Crouch End, N.8.
W. RICHARDS (BRS3768 and 2AAW), 3 College Street, Burnham-on-Sea, Somerset.
J. G. ISBISTER (BRS3769), 19 Well Park, Stromness, Orkney.
S. H. GARNER (BRS3770), 8 Holdings, Little Woodcote, Wallington.
Dr. C. E. W. WHEATON (BRS3771), 25 Godfrey Street, Chelsea, S.W.3.
J. N. SINCLAIR (BRS3772), Annsbrae House, Lerwick, Shetlands.
V. S. PONTEFRAC (BRS3773), 272 Blackmoorfoot Road, Crosland Moor, Huddersfield.

DOMINION AND FOREIGN

- G. H. BANFIELD (BERS484), P.O. Box 64, Gwelo, S. Rhodesia.
P. I. SPENCER (BERS485), at 20 Barkston Gardens, S.W.5.

**IS YOUR SUBSCRIPTION DUE ?
PROMPT PAYMENT
SAVES TIME AT HEADQUARTERS**

WIDE-BAND FREQUENCY MODULATION SIMPLY EXPLAINED—Continued from page 401.

for the use of the 112 Mc. band and will give special permission for the development of this interesting new form of modulation. Perhaps, too, the British Government will show its appreciation of the services of the many amateurs who are at present with the Forces, by relaxing the strictness of the experimental licence regulations. May that time come soon.

References

1. *Fundamentals of Frequency Modulation*. D. E. Noble. QST, August, 1939.
2. *F.M. in Amateur Communication*. G. Grammer and B. Goodman. QST, January, 1940.
3. *The New System of Frequency Modulation*. J. N. Walker. The T & R Bulletin, January, 1940.
4. *A Practical 112 Mc. F.M. Transmitter*. B. Goodman. QST, February, 1940.

COSMIC NOTES—Continued from page 402.

WGEA the General Electric Co., stations at Schenectady. The check is usually made between 21.00 and 21.30 G.M.T. At this time WGEA has frequently been an S9 plus signal during the past month, while WGEO has usually been rather weaker at about S6. The signal strengths are as indicated on the "S-meter" of a communications receiver. Both stations were stronger than normal on March 6, while on March 8 and 9 both were well below normal. On March 12 very rapid fading ("flutter") was evident on almost every station and although WGEA was S6 at the time of the check the programme was only 10 per cent. intelligible. WGEA operates on 15.33 Mc. and WGEO on 9.53 Mc.

Late News

A fade-out of trans-Atlantic signals was recorded on the afternoon of March 27 at G2XC. This was confirmed by a report in the daily press that a severe fade-out of short-wave broadcast stations occurred in U.S.A. on that date. The writer was listening to GSA (6 Mc.) when at 16.22 G.M.T. the signal strength dropped abruptly, followed by severe fading. A check was made on the other broadcast bands and it was found that all U.S.A. stations had disappeared. Several of them had been good signals 30 minutes previously. Unfortunately, listening had to cease at 16.30 but at 20.00 conditions seemed normal again. Observations by other members would be appreciated. The characteristics of this fade suggest it was of the Dellinger type, i.e., absorption by an ionised layer below the usual E layer, caused by a bright chromospheric eruption on the sun.

Another magnetic storm of some severity apparently began during the evening of March 29, for between 21.30 and 22.00 G.M.T. a brilliant aurora display was visible at Portsmouth.

Short-wave conditions were extremely poor and up to March 31 they had not completely recovered. The upper frequency limit was less than 15.5 Mc. at 22.00 G.M.T., March 30, and no U.S.A. broadcast stations were heard that day.

EXCHANGE AND MART.

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