R·S·G·B VOLUME 19 · NO. 3 · COPYRIGHT · PRICE 1/6 SEPTEMBER 1943

BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

- COMMUNICATION ON CENTIMETRE WAVES
- SIMPLE NOISE LIMITER
- APPLIED D.C.
- THEME AND VARIATION ON THE DOUBLE SUPERHET RECEIVER

R.S.G.B. BULLETIN

OFFICIAL JOURNAL OF THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN

Published on or about the 15th of each month. Issued free to members.

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NEW RUSKIN HOUSE,
LITTLE RUSSELL STREET, LONDON, W.C.1.
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Advertisement Manager: HORACE FREEMAN.

Advertising Office:
PARRS ADVERTISING LTD.,
121 KINGSWAY, LONDON, W.C.2
Telephone: Holborn 2494

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VOL. XIX. **SEPTEMBER, 1943** **No. 3**

AMATEUR ENTERPRISE AND STATUS

IT was refreshing, and not a little gratifying, to learn from no less an authority than Mr. G. M. Garro-Jones, M.P. (Parliamentary Secretary to the Minister of Production and Vice-Chairman of the Radio Board) that the Government accepts the fact that many of the outstanding radio developments of the present war can be traced back to, what he was generous enough to call, "amateur enterprise." Mr. Garro-Jones was speaking at the July meeting of The Radio Industries Club, to an audience of nearly 400, representing Industry, the Press and the Services. During the course of his address, which dealt with many phases of Radio Engineering in war-time, Mr. Jones pleaded for a more comprehensive system of technical training, designed to give young engineers a broader outlook—a view which will be shared by every far-sighted member of the Society.

Now that the war is reaching a climax the time seems opportune to consider what steps we, as a Society, can take to ensure that amateur enterprise suffers no set-back when the present ban on experimental transmitting activities is lifted.

One thing seems clear—the average amateur's knowledge of the principles governing the operation of radio circuits will be considerably greater than in September 1939. Can this newly-gained knowledge be used to good effect ? The answer is "yes" provided no irksome restrictions are imposed at International Conferences. We are convinced that the fighting Services have now learnt that the enthusiastic radio amateur—spurred on by the achievements of the pioneers of the Movement—is a valuable asset to the community. A true assessment of his value will not be possible until the need for secrecy has disappeared, but already sufficient has been said and written to indicate that he has left his mark in every theatre of war, and in every sphere of radio development. Because he has been self-taught he has acquired the ability to do things for himself. He has never been afraid to apply his knowledge, gained as an amateur in the hard school of experience, to the problems which have beset him in the field or in the factory, an attribute which has earned for him high praise in official circles.

Looking ahead to the future we visualise the time when the amateurs of this country will be able to command the fullest support from the radio industry. Just prior to the war there were clear indications that many British valve and component manufacturers were preparing to cater for the amateur. We confidently hope that when peace returns they will jump in quickly and capture the market before an avalanche of cheap foreign-made apparatus and equipment descends upon us. That our own manufacturers *can* meet the requirements of the British amateur has been amply demonstrated during the past four years, when numerous items of equipment, ideally suited to experimental work, have been put to the test of war service.

With many thousands of skilled ex-Service personnel awaiting an opportunity to commence, or continue, experiments in their own homes, to say nothing of those who have been on the home front, we as a Society should foster the closest possible relationships with the radio trade so that when the time comes its members will know our requirements and will be ready to provide us with the many new components and valves we shall need to bring our stations up to date.

Then, too, what of the status of the genuine experimenter ? Before the war it was not unusual to hear him described as a "dabbler." His war service, has, we hope, killed for ever such an appellation, but we should do well to ensure that his status is raised to a level comparable with that held by the professional radio engineer. That such recognition is long overdue few will deny, but whether it can be achieved depends largely upon the individual efforts of every member.

Not so many years ago that likeable, but vitriolic, old gentleman "Uncle Tom" made us squirm with his monthly doses of acidity aimed at raising the standard of British amateur radio. His criticisms of inane telephony conversations, "rubber stamp QSO's," assumed American accents and the like were more than justified, but they must not be levelled again. The movement to which we are proud and privileged to be associated must aim high. Nonsensical twaddle, including tea parties around the microphone, must have no place in the new world of Amateur Radio.

The fact that Society members have been invited to attend meetings of the Institution of Electrical Engineers, Wireless Section, is proof of the desire on the part of qualified professional radio engineers to work in close association with recognised radio amateurs. Perhaps the time is not far distant when every enthusiastic R.S.G.B. member will be permitted to seek the privileges of I.E.E. Wireless Section membership, even if his sole claim to recognition is that he has made a useful contribution to the science of radio communication.

J. C.

COMMUNICATION ON CENTIMETRE WAVES

PART III

By J. H. SHANKLAND, B.Sc., Grad. I.E.E. (GM8FM)*

Resonant Circuits

WHEN a normal resonant circuit, consisting of an inductance in parallel with a capacitance, is adapted so as to tune to wavelengths in the micro-wave spectrum, it is found that, as the wavelength approaches the dimensions of the circuit, there will be an increasing amount of power radiated by the circuit, and hence lost. This radiation loss is one of the major problems confronting the centimetre-wave engineer.

The usual way of dealing with a resonant circuit at the lower frequencies is to consider the coil as a pure inductance in series with a resistance; this latter being the ohmic resistance of the coil with an allowance made for the skin effect. No allowance is made for the loss due to radiation, which is negligible at the lower frequencies. As the frequency is increased the current in a conductor tends to flow more and more on the surface layer. For example, at a wavelength of 3 metres (100 Mc/s.) the thickness of the current-carrying layer in a copper conductor is less than 0·001 inch. The thickness of the layer may be found from the formula :—

$$\delta = \frac{1}{2\pi}\sqrt{\frac{\lambda\rho}{30}}$$

where λ is the wavelength in centimetres, and ρ is the resistivity of the material in ohms per cubic centimetre. Thus the thickness of the conducting layer is proportional to the square root of the wavelength. At centimetre wavelengths the conducting layer is extremely thin and the current should be regarded as flowing on the conductor instead of in it, and giving rise to electric and magnetic fields in the vicinity of the conductor. These fields travel away from the source with the velocity of light and any electro-magnetic field leakage from the circuit will constitute a radiation loss.

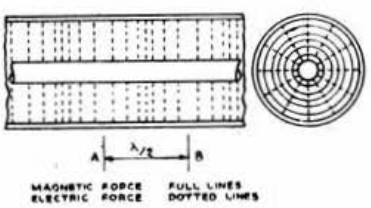

Fig. 13.
Field configuration in a co-axial line.

In an attempt to reduce this radiation loss, transmission lines were used as resonant circuits, the best known being the quarter-wave Lecher system consisting of two parallel wires or tubes a quarter wavelength long and short-circuited at the remote end. Centimetre waves are guided along these rods from the source to the remote end where reflection takes place at the short-circuit. The fields extend for a considerable distance into the medium around the conductors, and due to imperfections of the short-circuit, total reflection does not take place and a certain amount of electro-magnetic energy escapes and is lost to the circuit. The electro-magnetic energy should be regarded mainly as being in the dielectric medium in the vicinity of the conductors, and not penetrating the conductors to any great extent. The conductors are merely boundaries between which waves are propagated.

Since the electric and magnetic fields do not penetrate metal to any great extent, then resonant circuits for use on centimetre wavelengths should be self-enclosing so that the fields do not extend outside the circuit and thus the radiation loss from the circuit is zero. These conditions are fulfilled by a half-wave length of concentric transmission line shorted at both ends. Let us then examine a length of concentric line transmitting high-frequency energy from the point of view of electro-magnetic field distribution, instead of adopting the concept of current electricity usually applied to circuits operating on lower frequencies. Fig. 13 shows a cross-section and a longtitudinal section of a length of concentric transmission line. No field extends outside the line and hence radiation is zero. The lines of electric force are entirely radial and the regions of maximum and minimum electric flux density are regularly spaced along the length of the line. The lines of magnetic force are concentric with the line and have regions of maximum density where the electric flux lines have regions of minimum density. Neither the electric nor the magnetic field have components in the direction of propagation of the energy. A self-enclosing resonant circuit may be made up of any even number of half-waves, short-circuits being provided at points along the line (such as A and B Fig. 13) where the electric field is zero. A resonant circuit consisting of one or more half wavelengths of line short-circuited at the ends will be non-radiating since the fields will be entirely contained by the circuit. The centimetre waves should be thought of as travelling backwards and forwards along the length of line, reflection taking place at the short-circuits (voltage nodes). For maximum voltage step-up ratio the length of the line should be one half wave long. Actually the step-up ratio is maximum for a quarter wave length line, open at one end, but such a quarter-wave circuit will radiate unless the open end is shielded (as in Figs. 2 and 3 Part I). Such half and quarter-wave concentric circuits are suitable for use down to about 5 cms., provided that the inside diameter of the outer conductor is reduced with the wavelength. The reason for this will be apparent when cavity resonators have been discussed. Coupling to these circuits is usually effected by inserting a small loop at the short-circuited end where the magnetic field is at a maximum (or at any voltage node in the case of a length of line more than one half-wave long).

Cavity Resonators and Wave Guides

As long ago as 1897 Lord Rayleigh proved mathematically that electro-magnetic waves could be propagated along hollow tubes without having a return conductor, as is usual in the case of a radio frequency transmission line, and that hollow metal bodies had a resonant frequency. This discovery was not however utilised until about 1935, due to the fact

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that the cross-sectional dimensions of the hollow tube or resonator had to be of the same dimensions as the wavelength of the waves to be transmitted, and as there were no known means of generating centimetre waves the large size of the tube involved for the wavelengths then in use made the system impractical. However, in 1935 when the magnetron and Barkhausen oscillators were available for the production of energy at wavelengths down to 10 cms. (3,000 Mc/s.) interest in hollow resonators and "wave-guide" transmission lines revived and several theoretical and experimental papers on the subject were published in the U.S.A.

Before proceeding further it should be pointed out that for a proper understanding of the operation of hollow resonators and waveguides a fairly high standard of methematics is necessary, involving the use of Maxwell's equations. Such a mathematical treatment is beyond the scope of this article. For those who are interested in the mathematics of the subject there are numerous papers, and two text-books available, dealing exclusively with the theoretical treatment of the subject. (See Bibliography.)

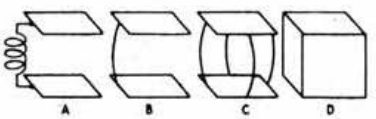

Fig. 14.
Derivation of a hollow resonator from a conventional tuned circuit.

Hollow Resonators

The concept of resonances in hollow bodies will appear strange to those accustomed to dealing with more conventional resonant circuits, but there is a way of deriving a hollow resonator from the more conventional type of resonant circuit. Let us consider a resonant circuit consisting of two condenser plates tuned to resonance by means of an inductance (Fig. 14A). Now in order to increase the resonant frequency of the circuit the size of the inductance must be reduced (keeping the condenser unchanged) until it consists merely of a heavy metal strip connecting the two plates (Fig. 14B). To increase the frequency still further, several such strips may be connected in parallel to give a lower inductance. These may be connected around the condenser plates as is shown in Fig. 14C. If the inductance is still further decreased by connecting an infinite number of conductors in parallel around the edges of the condenser plates we obtain a closed box (Fig. 14D). If such a hollow box is excited at its resonant frequency the top and bottom of the box will become charged and a high current will flow up and down the sides of the box. The electric field between the top and bottom of the box will not be uniformly distributed but will be most intense at the centre and will fall off at the edges to a very low value. Fig. 15A shows the electric field distribution for the simplest case of resonance in a rectangular box resonator. From the field distribution it will be seen that for the box to resonate at a given wavelength there must be a half-wavelength (or a multiple of half-wavelengths) across the face of the box. Thus cavity resonators will have a definite cut-off frequency (determined by the cross-sectional dimensions) below which the circuit will not resonate.

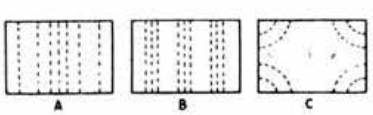

Fig. 15.
Oscillation modes in a rectangular resonator.

There are other modes of oscillation in the box resonator under consideration. Fig. 15B shows a case in which there are three half-waves across the face of the box and in Fig. 15C a mode is shown in which it is not the top and bottom of the box which resonate against each other but the sides which resonate against the top and bottom. In Fig. 16 the field distributions in a hollow sphere (A) and in a toroidal rhumbatron resonator (B) are shown. This latter is rather important as it is much used in the Klystron and reflection-type oscillators. The electric field is very intense across the neck through which the electron beam passes, thus ensuring deep velocity modulation of the beam, and the construction of the resonator is such that the distance traversed by the electron beam is as short as possible, thus securing a very small transit angle without resorting to excessively high accelerating potentials in the valve. Actually, any cavity resonator could be used in a velocity modulated oscillator provided that a sufficiently high accelerating potential could be obtained. In some cases a resonator with a transit angle of π radians, or multiples of π radians may be used but the toroidal rhumbatron has been found to be the most convenient.

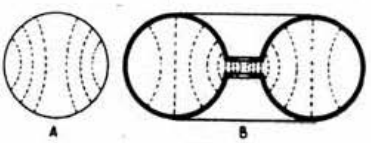

Fig. 16.
Field configuration in (A) a sphere. (B) A toroidal rhumbatron.

Since the circuits described are self-enclosing, there will be no radiation loss, and as there is a very large metal surface over which the oscillating currents flow, the Q of a cavity resonator will be very high, being given approximately by the formula :—

$$Q = \frac{\text{Volume of inner space}}{\text{Surface area} \times \delta}$$

where δ is the thickness of the inner conducting layer of the wall, and which may be calculated from the equation given previously. Values of Q of the order of 50,000 may be obtained.

If the thickness of the metal enclosing the cavity is appreciable, *i.e.* thick compared to the depth of penetration of the current, points on the outside surface of the resonator will be at zero radio-frequency potential and if it is desired to measure the radio frequency voltage between two points (say between the top and bottom of a rectangular box cavity), then the measuring device must be connected to the inside surfaces of the resonator. If connection is made to the outside surfaces there will be no indication of any radio frequency voltage. Thus the inside and outside surfaces cannot be regarded as being at the same potential.

Coupling to cavity resonators is usually effected by means of a small loop inserted in the resonant space at a point where the magnetic field is most intense, but the resonator may also be excited by inserting a small probe along a line of electric force. The problem of coupling to hollow resonators will be treated in the next part of this article.

Each cavity will have several modes of oscillation and thus may resonate at several frequencies so that care must be taken to introduce the electro-magnetic energy at the correct point so that the desired oscillation mode may be set up. Cavities may be used in the same way as conventional resonant circuits as filters and acceptor circuits. Tuning is usually effected by making one of the walls in the form of a movable piston with finger contacts pressing on the other walls. As the *Q* of these circuits is usually very large, the tuning will be very sharp, necessitating a screw-thread device for moving the tuning piston.

In the case of the toroidal shaped resonator, the piston-tuning is impossible, but the frequency of the resonator may be altered, either by making the walls compressible or by introducing a plug of metal into the interior of the rhumbatron, thus altering the volume of the resonant space.

(To be continued.)

A SIMPLE NOISE LIMITER

By J. W. Cropper, G3BY.*

A SIMPLE and effective noise-limiter can be produced with the aid of a pair of Westinghouse type W4 metal rectifiers connected as shown in Fig. 1a.

The use of a metal rectifier as a noise-limiter is not new, in fact, an arrangement was described in the *Radio Handbook* as far back as 1937, as well as in pre-war editions of *The All Metal Way* (a publication of the Westinghouse Company). In both cases, however, a single rectifier only was shown connected between grid and earth of an L.F. stage.

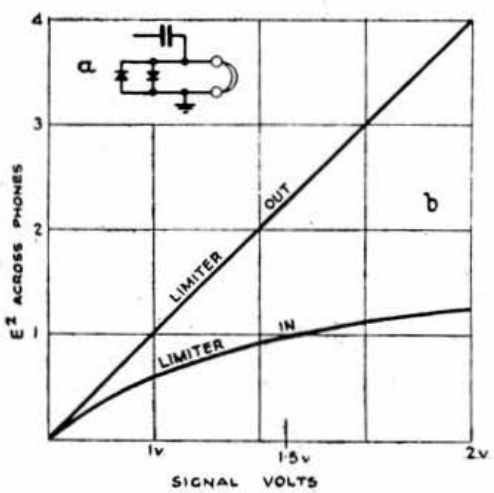

Fig. 1.

(a) Shows method of wiring up rectifiers as a noise limiter.
(b) Curve relating "volts squared" across the phones with signal voltage.

It is generally recognised that a metal rectifier passes practically no current, even in the conducting direction, until the voltage exceeds 0·5 volt.

If then two rectifiers are wired in parallel across the headphones and so arranged that they conduct both ways, then the combination will act as a very high resistance to any flow of current, provided the voltage is less than 0·5 volt. Above this value the combination presents a relatively low resistance.

In practice it has been found that when both noise and signals are strong the resultant level is partially reduced, whilst weaker signals are audibly unaffected. The net effect is that strong signals are not seriously impaired, but ignition noises and other forms of man-made static are reduced. Very strong commercial signals are weakened with the result that listening becomes less nerve-wracking during noisy conditions.

When a single rectifier is used, an obvious defect is that only the positive—or negative—component of the noise is reduced, depending upon which way round the rectifier is connected. On actual test it was found that the use of a single rectifier did not justify its use, whereas the dual arrangement produced a worth-while improvement.

It should be pointed out that the double rectifier can only be used with a filter output, because a D.C. component would carry the rectifier past its 0·5 volt limiting condition. This would, of course, result in an all-round reduction in signal strength.

The curve, Fig. 1b, illustrates the effect across the phones with the limiter in and out of circuit. The curve was taken with the receiver delivering a steady heterodyne note of approximately 500 cycles. It will be noticed that the effect of the limiter does not become really decisive until the voltage across the phones approaches one volt, although there is an appreciable improvement at 0·5 volt.

Substitutes

It is considered probable that a pair of single elements from a disused H.T. rectifier could be used in lieu of the standard units recommended, but the capacity effect of the relatively large disc might be noticeable. The capacity value of a 10 mA instrument-type rectifier, for example, is stated by the manufacturers to be 0·05 μF—a figure which may seem rather high until one remembers the electrolytic rectifier and its modern counterpart—the high capacity electrolytic condenser.

Current Rating

Although the current rating of the W4 rectifier is quite low (about ·35 mA), it is apparently sufficient for the intermittent conditions of C.W. reception, because a pair have been in constant use in the writer's receiver for many months.

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APPLIED D.C.

By F. J. Forbes, 2BFC.*

PART I

The application of a direct current supply to radio equipment often presents acute problems even to those with technical ability, and these problems are aggravated by the fact that most constructional articles are concerned with A.C. In this article, the first of a series, the author deals with many aspects of D.C. design.

APART from electro-mechanical devices, such as rotary convertors and vibrator units, D.C. mains can be made to deliver a very efficient source of supply for receivers, low power transmitters and other apparatus. The many D.C. mains valves which are now available provide a performance comparable with, and in many cases superior to, their A.C. counterparts.

In this particular article it is proposed to give consideration to D.C. design in general, with special reference to heater circuits.

Standard Heater Circuits

As the heater circuit is generally the governing factor after a receiver design has been sketched out, problems connected therewith will be treated first. Valves with a heater consumption of 0·3; 0·2; and 0·15 amps (the most usual types of modern valves) are intended to be used with their heaters connected in series. As the current measured at any point in a series circuit is the same, it follows that valves operating at the same heater current should be used in any given circuit.

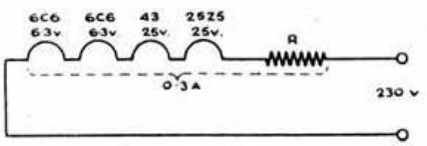

Fig. 1.
An example of a well-known valve combination to illustrate calculation of R.

A.C. valves are not wired in series because of their high current consumption which would necessitate a very large and unwieldy resistor, approaching the dimensions and wattage of an electric fire! For example, if four valves of the 4v 1A class are connected in series, then the resistance R, Fig. 1, will be required to drop 214 volts (on 230 volt mains) equivalent to 214 watts dissipation! The valves in Fig. 1 cannot be paralleled as their heaters are not of the same voltage rating. Part II will deal with the provision of high tension supply.

The number of heaters in series is immaterial, providing the total heater voltage does not exceed the supply voltage. The former voltage may be of any value, although usually it is between 6·3 and 50 volts; except for some later types which are rated up to 117 volts.

Consider Fig. 1 which depicts four American type valves in series. Two of the valves operate at 6·3 volts and the other two at 25 volts. The total voltage required is thus 62·6 volts (6·3+6·3+25+25). Clearly in order to operate these valves from a 230 volts supply a ballast resistor (R) must be inserted in the line to absorb the surplus voltage. The value of this resistance can be calculated from Ohm's Law: $R = E - E_1/I$, where E is the mains voltage, E_1 is the voltage to be dropped and I is the heater current in amps. ∴ R = 230—62·6/0·3 = 558 ohms.

The ballast resistance (R) may be of the wire wound type ($\frac{3}{8}$ in. diameter by 5 in. long) and its power rating can be calculated from the expression: Watts = EI, which for the example quoted equals (167·4 × 0·3) 50 watts approximately. Alternatively R may be a line cord, *i.e.* a resistance which is incorporated with a length of ordinary flex. In the author's opinion this arrangement is not altogether satisfactory for the following reasons:

(1) Assuming a resistance of 200 ohms per yard, the cost of the line cord would be approximately 10s., based on 4s. 6d. per yard run.
(2) A line cord of this length would be difficult to dispose of, especially as it must not be kinked.
(3) As a considerable amount of heat is dissipated it would be necessary to provide adequate ventilation, which means keeping it as free as possible.

In practice the value of R should be a little greater than the calculated value (say between 570 and 600 ohms for the example quoted); this allows for slight errors in the mains and test meter. To test for correct heater operation insert a 0—1 ammeter in series with

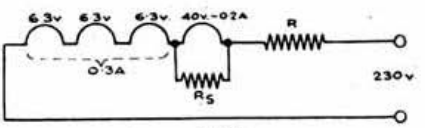

Fig. 2a.
Method of using a valve with different heater ratings.

the mains input. Alternatively connect a voltmeter of suitable range across any one heater—this is the easiest way—and adjust R by taking off a turn or two at a time. If a line cord is used, cut the cord an inch or so at a time—but switch off the mains first! It is advisable to adjust so that the readings are slightly low; if possible, this should be done when the local mains load is at a minimum, thus ensuring maximum voltage at the receiver plug.

If these points are kept in mind, any mains supply from 100 to 250 volts, or any number of valves may be used, providing the relevant figures are substituted in the formulæ. The value of 100 volts is quoted as a minimum not so much because of the heaters but because this is about the lowest practicable voltage for high tension supply, especially as the next standard voltage for private house installations is 50 volts.

Mixed Heater Circuits

When employing valves with different values of heater current in the same circuit, it is necessary to

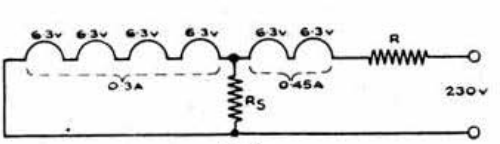

Fig. 2b.
Four 0·3A valves shunted by a resistance R_s to permit them to be used with two 6V6's rated at 0·45A.

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ascertain which of the valves has the highest heater consumption as this determines the main line current (see rule for series circuits mentioned earlier).

For example, if three 6·3v ; 0·3A valves and one 40v ; 0·2A valve are used, then as 0·3A is the greater, this is the value of the line current (Fig. 2a). Now the 40-volt valve must be shunted to pass the extra 0·1 ampere. The value of this resistance R_S is found from Ohm's Law ; first subtract the valve current from the line current, *i.e.* $0·3 - 0·2 = 0·1$ (which is the current R_S must carry) then as the voltage drop across both shunt and valve is 40 volts, $R_S = 40/0·1 = 400$ ohms. The rating in watts is given by $EI = 40 \times 0·1 = 4$ watts. To be on the safe side a 5 watts resistor should be used. In calculating the value of R (the mains series resistor) the 40-volt valve is now classed as a 40v 0·3A, although as has been noted the valve heater passes only 0·2A.

A variety of circuit arrangements can be based on the above data. For example, assume two 6V6's are to be used with four 6·3v 0·3A valves (Fig. 2b). As the 6V6's take 0·45A each this is the line current. The 6·3v valves must be shunted by 168 ohms ($4 \times 6·3 = 25·2$v and $0·45 - 0·3 = 0·15$A, $\therefore R_S = 25·2/0·15 = 168$ ohms) at 3·78 watts. To calculate R the 6·3v 0·3A valves are now classed as 6·3v 0·45A. These "mixed" arrangements are useful when odd valves are on hand for construction, or for repairs to receivers for which specified valves are not available. They can also be used in the field when the correct type of valve is not on hand.

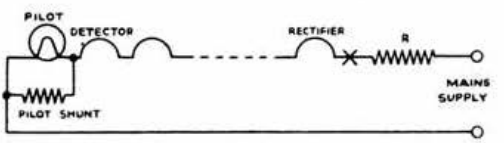

Fig. 3.
Connection for single pilot lamp ; others may be connected in series. An alternative position is shown at X.

Pilot Lamps

Although pilot and indicator lamps may be placed in series with the heater chain at any point, the more usual position is at the beginning or end of the circuit (Fig. 3). Lamps which are usually rated at between 3.5 and 8 volts, should be of the same current rating as the valves. They should be shunted by a resistor of about 100 ohms, more, if sufficient light is not obtained, less if the filament tends to flash when first switched on. This shunt serves two purposes, first, it prevents surges and second, if a lamp becomes disconnected it completes the heater line. When determining the value of R, the total valve and lamp voltages should be added together ; the effect of the 100 ohms shunt can be neglected, since this is taken care of when adjusting R.

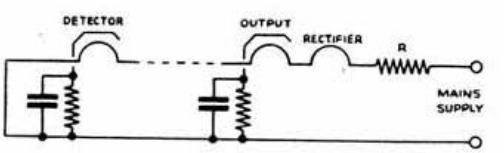

Fig. 4.
Illustrates heater/cathode potentials. The pentode is at maximum; the potential decreases through the line until the detector is reached where it is at minimum.

Valve Positions

When connecting up the heater line, two points should be remembered : first place the rectifier directly after the resistor R and follow with the output valve. Second, always connect the detector or second detector so that one side of the heater is taken direct to the chassis line. Attention to these small details tends to reduce hum, which is a matter of heater/cathode potential. Reference to Fig. 4 shows that the output and rectifier are at the high potential end of the chain and the detector at the low potential end ; as the heater wiring is not filtered it carries mains ripple into the set which is only too easily picked up by the wiring. The position of the other valves in the chain must be fixed by experiment.

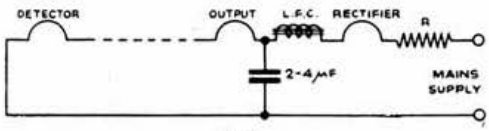

Fig. 5.
Showing position of L.F. choke in the heater line, to reduce hum.

Hum

D.C. mains hum can be a source of considerable annoyance especially where the supply company employs Mercury Arc rectifiers. Paradoxically, a rectifying valve can be used in the D.C. receiver to diminish hum—but more of this later.

A considerable reduction in hum level can be achieved by inserting an L.F. choke in series with the mains line (Fig. 5). The resistance of the choke may vary between 10 and 100 ohms but it must be capable of passing the heater current. The choke should be decoupled by a condenser (2 to 4 μF). Clicks and other forms of mains static are often considerably reduced by connecting a 0·01 μF condenser across the choke. It is also worth while to move the choke around the chassis and rotate it to find the position for minimum hum. It sometimes happens that one heater in the circuit is responsible for the introduction of modulation hum ; this can be silenced by connecting a 0·01 μF condenser in parallel with the troublesome heater. Heater leads should be kept clear of grid connections and R.F. leads. The mains input components should be kept away from signal circuits, preferably in a separate chassis which may contain the ballast resistor (R), L.F. choke, and shunts.

Heat

As the rectifier, pentode, and ballast resistor R dissipate about 65 watts (Fig. 1), care must be taken to ventilate the receiver chassis if power pack and receiver are mounted together.

(To be continued)

THEME AND VARIATIONS ON THE D.S.H.

By I. B. Whitstable

IN his original article dealing with Double Super-Heterodyne Receivers.(1) "The Workshop Man" put forward the proposal that bandspread could be achieved by (*a*) using a fixed second I.F. and (*b*) arranging for the first I.F. stage to be tunable over a band of 500 kc/s.—a fixed R.F.O. being employed for each band. This proposal was later the subject of correspondence with Mr. H. Whalley, G2HW, whose views were published in a later article(2). The writer however, took the line that, in a practical case, image interference would not be experienced with such a circuit and the present article has been prepared as the result of personal experiments made in relation to this aspect of the subject.

In order to use a first I.F. which is variable in frequency it is necessary for the second R.F.O. also to be variable in frequency so that a fixed second I.F. is produced. In a D.S.H. this is however an advantage over the original proposal (*i.e.* having a fixed second R.F.O. and a variable first R.F.O.) because as one of these local oscillators *must* be variable, it would seem only logical, from the stability point of view, to make the second (and lower) frequency the one which is varied.

Any normal type of superhet receiver will fulfil the conditions for the second half of a D.S.H. in that it represents a fixed I.F. stage, a variable frequency local oscillator and a variable first I.F. stage (*i.e.* the R.F. amplifier). To convert a normal superhet into a D.S.H. all that is required is a small "add-on" unit containing the new R.F. circuits, the first Frequency Changer and the fixed R.F.O. Such a unit, termed a "D.S.H. Convertor," can be constructed to form a fixed part of the receiver, or alternatively, it can be used to provide the normal communications receiver with bandspread facilities. In the latter case the unit is switched into circuit only when required. For general coverage the receiver is used as a normal superhet. A block diagram of the arrangement is shown in Fig. 1.

The new R.F. stage and the grid circuit of the first frequency changer are tuned and the degree of bandspread action is controlled by the use of a switched crystal oscillator as the first R.F.O. To give an example :—

Input frequency band.	*R.F.O. Crystal.*	*1st I.F. tunable over.*
3 Mc/s. to 4 Mc/s.	2·5 Mc/s.	500 kc/s. to 1,500 kc/s.
3 Mc/s. to 4 Mc/s.	5·0 Mc/s.	2 Mc/s. to 1 Mc/s.
3 Mc/s. to 4 Mc/s.	10·0 Mc/s.	7 Mc/s. to 6 Mc/s.

The input frequency band of 3 Mc /s. to 4 Mc /s. is represented on the general coverage receiver as a dial swing of 45°, whilst in the three cases quoted the first I.F. dial swing is represented by 180°, 90° and 30° respectively. It can be seen therefore that for a given input frequency band the bandspread effect can be "expanded" or "contracted" as required by altering the frequency of the fixed first R.F.O.

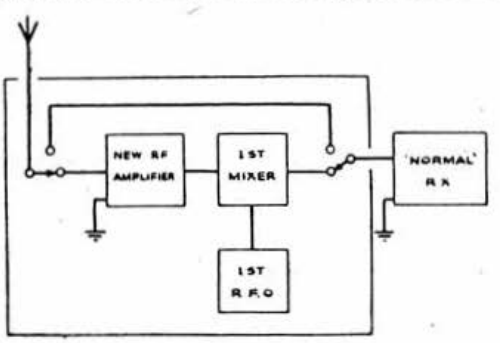

Fig. 1.
Block diagram of Double Superhet Convertor.

It would seem at first sight that this application of the D.S.H. principle is cumbersome and expensive, but such is not the case. The proposal has already been put forward to utilise a fixed R.F.O. covering one band of frequencies, and to employ oscillator harmonics on other bands.(3) The same considerations are still true in the case under review, namely, the use of one crystal frequency—the harmonics or sub-harmonics of which give a wide variation of input frequency before the necessity arises to change the crystal to obtain another "family" of frequencies(3). For example a crystal oscillator on 5 Mc /s. and its harmonic content at 10 Mc /s. (to consider only one harmonic), would beat with incoming signals on 2 or 8 Mc /s. and 7 or 13 Mc /s. respectively to produce a first I.F. of 3 Mc /s. Thus the input R.F. and mixer coils can be switched to cover two frequency bands, whilst only one oscillator crystal is used.

The objection to this system is the question of images, but to consider an example. Suppose, to simplify matters, that the first I.F. is left tuned to 3 Mc /s. and that a 5 Mc /s. crystal oscillator, designed to be rich in harmonic content, is used. An input frequency of 2 Mc /s. will produce numerous I.F. components at the mixer anode in the sequence 3, 7, 8, 12 Mc /s., etc., all of which, except the first, will be attenuated by the selectivity of the first I.F. stage. Under the same conditions, an input signal of 2 Mc /s. will produce the required I.F. beat. Again a frequency of 7 Mc /s. will beat with the 10 Mc /s. harmonic of the R.F.O., but this 7 Mc /s. signal has to pass through the R.F. and mixer coils which are tuned to a frequency of 2 Mc /s.

A further value of the use of a D.S.H. Convertor could be brought about by the fact that for a given input frequency and a given R.F.O. crystal frequency, two alternative first intermediate frequencies are available. Suppose that the input frequency is 2 Mc /s. and the R.F.O. is 2·5 Mc /s., then the resultant I.F. will either be 500 kc /s. or 4·5 Mc /s. Thus either a high or a low first I.F. could be obtained at will. A normal type of frequency changer produces a very small component of this sum frequency, but it is suggested that utilising a secondary emission valve such as the "Augetron"(4) it will be possible to utilise the sum component, thus permitting the alternative combinations of High-Low or Low-Low I.F. sequence.

A practical circuit of a D.S.H. Convertor is shown in Fig. 2, from which it can be seen that standard practice has been adhered to, except in the anode circuit coupling for the Mixer stage, and that a crystal oscillator is used for the R.F.O. The unit is built up into a small cubical metal case in a manner similar to that employed for a pre-selector.

It will be noticed that no A.V.C. is applied. The reason for the omission is based on the writer's experience that one of the chief causes of instability, and other more obscure coupling faults, in a D.S.H. is brought about by interaction, through having a common A.V.C. line to the various I.F. and R.F.

stages. The only solution seems to be to run the R.F. and first F.C. stages without A.V.C. and apply A.V.C. only to the later stages of the receiver. Separate A.V.C. rectifiers could be used, but immediately the question of economy raises its head.

It is interesting to note that since this article was first prepared yet another derivative of the D.S.H. has appeared, in which a fixed second I.F. and fixed second R.F.O. were used, preceded by a "Single Span" first R.F. and Frequency changer unit.(5)

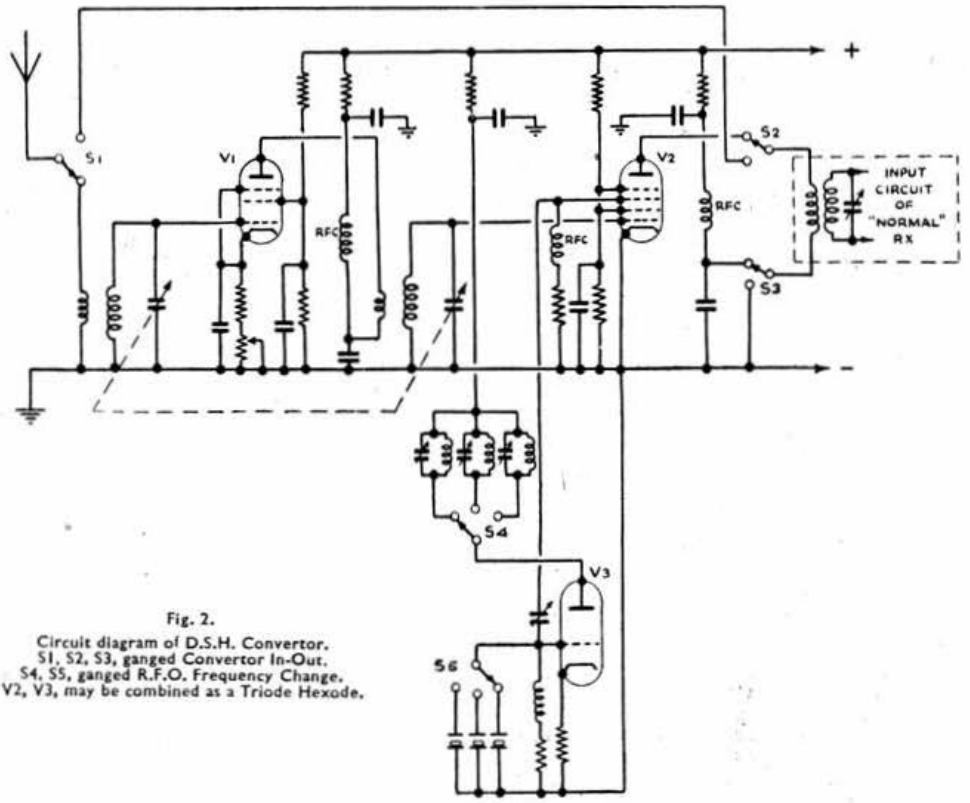

Fig. 2.
Circuit diagram of D.S.H. Convertor.
S1, S2, S3, ganged Convertor In-Out.
S4, S5, ganged R.F.O. Frequency Change.
V2, V3, may be combined as a Triode Hexode.

(1) "Concerning Double Superhets," *T. & R. Bulletin*, June, 1942.
(2) "More about Superhets-Double and otherwise," *R.S.G.B. Bulletin*, February, 1943.
(3) "A Review of Frequency Division," *R.S.G.B. Bulletin*, June, 1943.
(4) *The Journal of the British Institution of Radio Engineers*, vol. 2–5, 1941–42.
(5) "The Principles of Single Span Tuning," *R.S.G.B. Bulletin* July, 1943.

Book Review

THE CATHODE RAY OSCILLOGRAPH IN INDUSTRY. By W. Wilson, D.Sc. Chapman & Hall; 12s. 6d.

The title of this new book may not immediately attract the amateur. Nevertheless, a considerable proportion of its contents will appeal to those who take a live interest in new developments. The general description of oscillographs, and the circuits which operate them, covers methods and apparatus, much of which is applicable to amateur practice, although the latter may be surprised by the descriptions of some large metal tubes operating at 60kV.

A large section of the book is concerned with application of the C.R.O. to engineering fields other than radio, such as measuring surges on power lines, hysteresis of magnetic materials, the measurement of thickness and pressure, the speed of camera shutters, indicator diagrams for internal combustion engines, and even the state of the human heart.

One of the most recent applications of electronics provides the most intriguing chapter, *i.e.* the electron microscope. There are some beautiful photographs of objects which are so small that they must ever remain invisible with the most powerful optical microscope for the simple reason that they are smaller than the wavelength of light itself.

Without doubt Dr. Wilson's book will reveal to many readers undreamed of possibilities for the C.R.O. which is now the most useful tool of the electrical and radio engineer.

H. A. M. C.

New Books Received

CLASSIFIED RADIO RECEIVER DIAGRAMS. By E. M. Squire. Pitman; 10s. 6d.

For the keen radio experimenter, service engineer or dealer this entirely new book should prove of immense value. It is illustrated with 332 diagrams, ranging from aerial input arrangements (including band-pass filters) to the more advanced types of receiver circuit which include push-button tuning and automatic frequency control.

The classification has been arranged with a view to providing the practical radio man with a ready reference to a representative selection of the types of circuit he is likely to meet in service. All the circuits illustrated are employed in actual receivers and the commonly used values of components are quoted for each circuit.

As the author aptly puts it in his preface, "diagrams are the shorthand of radio." We predict that this publication will receive a warm welcome in radio circles.

BASIC CALCULATIONS FOR R.A.F. GROUND DUTIES. By A. E. Druett, B.Sc. (Eng.), London, A.M.I.Mech.E. Pitman; 3s. 6d.

This book has been prepared primarily for airmen engaged in Radio, Wireless and Electrical Trades of the Royal Air Force by one who is fully qualified to know Service requirements. It should help men under training for these trades or remustering from a Group II to a Group I trade (*e.g.* Wireless Operator to Wireless Operator Mechanic), to reap the maximum benefit from their technical instruction. Cadets of the Air Training Corps who are training for any of these ground duties will find that the syllabus in Calculations for the Proficiency Examination is adequately covered.

The book includes chapters on fractions, decimals, indices, British and metric units, ratio and proportion, averages and percentages, formulæ and equations, measurement of angles, mensuration of the circle, right-angled triangles and graphs. Solutions to examples are given in the Appendix.

We suspect that many of the problems have been set in recent

(*Continued on page 48*)

THE LIGHT RECEIVER

By T. R. Nisbet (GM3SW)

THE purpose of the apparatus described in these notes and pictured in Fig. 1, is to convert visual signals, *i.e.* Aldis lamp, to audible signals which can be read in the same way as ordinary radio messages, thereby speeding up communication by means of light waves. The suggestions outlined are purely theoretical and have not been tested in practice, but the principle appears to be quite sound and should afford an interesting field of experiment to anyone having the necessary spare time and gear.

It is possible to signal with an Aldis lamp either plain Morse, *i.e.* where the lamp is illuminated on "mark" and darkened on "space," or "inverted" Morse, *i.e.* where the "mark" position corresponds with the darkening of the lamp, and the "space" with its illumination.

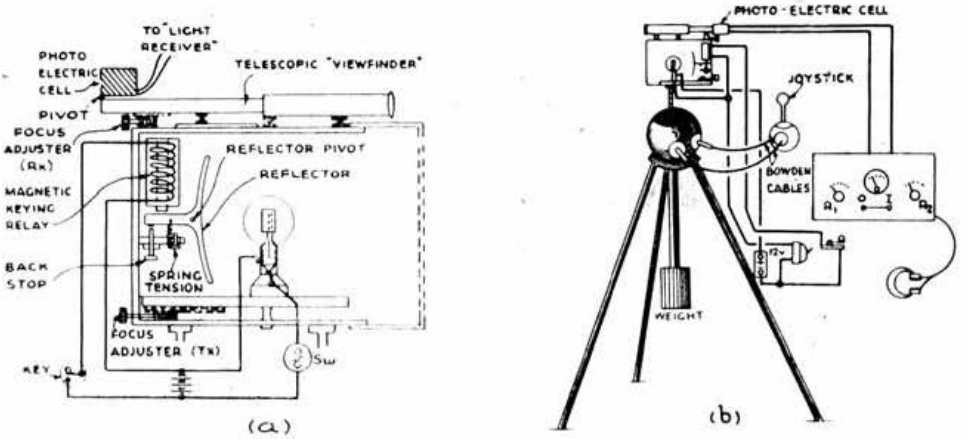

Fig. 1.

(*a*) Shows how the photo-electric cell might be fitted to an Aldis lamp for point-to-point working and (*b*) how the apparatus might be mounted for use by ships at sea.

In the "dark," or no signal, position the voltage leak across the photo-electric cell, Fig. 2, is balanced out by the application of negative grid bias to V1, which is then biased to a pre-determined value of anode current (where the I_a/V_s curve is steep) by adjusting the variable bias resistor R1. V2 is biased to cut-off by R2. In the light or signal position the drop in resistance in the cell caused by light falling upon it, causes the grid of V1 to swing positive, and the voltage developed across the load resistance (R3 or R4) is applied as positive bias to V2 causing it to pass current.

The resultant variations in screen voltage, due to the audio oscillator valve V3, are reproduced in the anode circuit of V2.

The ganged switch S1, 2, 3 should be in position "O" for plain Morse and should be turned to position "I" for "inverted" Morse. Resistor R2 must be re-set after any change has been made in the operating position of this switch. R1 may also need some slight adjustment.

Setting Up

(Assuming 3 mA. to be the pre-determined value of anode current of V1 and 2 mA. to be the bleeder current of R6, R2, R7.) The receiver must of course be trained on the sending station by visual means with the latter sending a long dash. R2 is rotated to maximum bias position and R1 adjusted for a reading of 5 mA. in the meter. R2 is then reduced to just off the point where the current begins to rise. The light signal should then be readable as sound in the headphones, and the meter may be removed from the circuit, and any final adjustments made to R1 and R2.

Adjustments for broad and fine tuning may be made at the transmitter, by moving the bulb nearer to the reflector, and at the receiver, by either placing the photo-cell out of focus with the receiver light, or enlarging the sensitive surface of the cell. Any combination of these methods may also be used. Broadened tuning will reduce signal strength.

Some possibilities which may form the basis of experiment are (i) Wheatstone Bridge input, (ii) application of audio A.C. direct to the cell, (iii) something similar to delayed amplified A.V.C. circuit in V2, (iv) photo-cell fixed on the side of a telescope with a mirror or prism arranged to deflect light into it when desired.

Fig. 1a illustrates a convenient method of adapting an Aldis lamp for point-to-point working with the "Light Receiver" and Fig. 1b a method of installing the apparatus aboard ship so that the operator could keep his receiver in tune by ear.

If the "Light Receiver" proves to be insufficiently sensitive, more D.C. amplifying valves (cathode of one to grid of next; load resistance in cathode to H.T. negative lead) could be inserted between V1 and V2.

Practical Applications

The set-up could be put to practical use in a number of ways some of which are indicated below :—

(1) Short point-to-point working, *e.g.* across a river, where telephone lines are impracticable and where distance and security do not justify the use of W/T.

(2) Between ships in a convoy, where the light is likely to be strong enough to dispense with the manual tuning control ("joystick") of Fig. 1b, by the use of broad tuning.

(3) Between ships in a Fleet, in order to speed-up non W./T. communication.

Further possible Applications

The current in V2, as has been seen, is proportional to the intensity of the light beam; if therefore, at the

(*Continued on page* 48)

KHAKI AND BLUE

● S./Sgt. A. E. Dowdeswell, **G4AR**, serving in Turkey as a member of a special instructional staff, claims to have been the first licenced amateur to arrive in that country, unless, as he says "TA1AA was ever proved genuine"! He wishes to be remembered to Capt. Larry Richards, G3YM, who incidentally claimed to be the first G to reach B.N.A. at the opening of the Tunisian campaign.

● Friends of old timer F./Lt. Frank Adams, **G2YN,** will be interested to hear that he has again left for abroad. His postal address is A6900, c/o A.P.O. 4685. Frank was in France during the early stages of the war, subsequently serving in Northern Ireland and at home stations in the south of England.

● An airgraph from India brings news of D. G. Farquharson, R. Sigs., **G3MF.** He wishes to be remembered to his friends in Districts 7 and 15, most of whom will no doubt be surprised to learn that he has "moved up" from Cadet to Captain in the short space of 18 months.

● The accompanying photograph sent by F./Sgt. Norman Horrocks, **2CUZ,** was taken whilst he was in Baghdad. Reading from left to right Cpl. Nettle (BRS6195), L.A.C. Brierley (BRS4114), F./Sgt. Horrocks, and Cpl. Abraham, (GW3AJ). He is at present attached to the A.M.E.S. Reserve Pool, M.E.F., where he has met F./Sgt. Gilbert and P./O. Jeffrey, G2JF.

● Ft./Lt. Shaun Southgate, **G8FF** who recently left for an overseas destination (A.P.O.3980), asks that his 73 be conveyed to his "half brother," W2IOP, and to G8DI. He met Capt. Lord, G5NU, aboard ship.

● Cpl. Stan Geary, **G3MO,** well known in District 12, writes by "V Mail" from 145 M.U., R.A.F., to report his safe arrival in B.N.A. He wishes to be remembered to all old friends and in particular to G2OK, RX, XJ, 4RW and 6PI.

● Cfn. J. P. Evans, R.E.M.E., licenced operator of **GW8WJ** (Prestatyn Short-Wave Club) now serving with D. Egan, 2FPC, in the M.E. seeks news of GW4CX and G6HQ. Letters should be sent c/o Roberts, Bunney, Ltd., Mostyn Street, Llandudno, N. Wales. He wishes to be remembered to G5KT, 6VD, 8RL, SD, WI, GI3JP and GM3RL.

● Tel. F. R. Wright, **4187,** writing from H.M.S. Brixham, reports having taken part in the North African and Sicilian campaigns. He left England last October and sailed in convoy to Gib. where he spent a few days looking up old friends. H.M.S. Brixham took an active part in the Oran landings, later convoying ships up and down the N.A. coast, calling at Algiers, Phillipville, Bone and Bogenta. Recently his ship has been sweeping mines off Syracuse where an exciting duel took place with Stukas and JU88s. In his travels he has met G3WZ, 2620, VE1ZE and W9WKY. The latter arranged for 4187 to visit his ship to examine the radio gear—most of which is of a type well known to amateurs.

● Sig. G. V. Haylock, **2DHV,** now in the M.E., has started a Forces Amateur Radio Club in a town in the Western Desert. The Army Educational authorities are giving useful publicity to the venture and have loaned a room for meetings.

● P./O. W. Day, **5571,** now at Greenwood, Kings County, Nova Scotia, would like to contact members serving in Eastern Canada, with a view to arranging meetings, and sending in regular reports to H.Q. He wishes to be remembered to all old Cranwellians.

● Cpl. G. Browne, R.E.M.E., **6337** an instructor at No. 2 R.M.S., would be glad to contact members passing through or stationed at the school. Recent efforts to arrange meetings have proved unsuccessful due to postings.

● From several sources we learn that a Tripoli Amateur Radio Society is now functioning but details are at present lacking as to the persons responsible for this enterprise. It is understood that the first meeting took place on July 26.

● In a further airgraph from Kilindini, Mombasa, L./Radio Mech. W. H. Hodgson, **G3BW** reports meeting VQ4CRR and 4CRK in Nairobi, where he was lucky enough to tour the local B.C. station. He spent a recent leave at Kisumu with 2AUM. G3BW suggests that if any member should find himself at Diago Suarez, he should look up Cpl. Beckett.

● Paisley friends of Cpl. Leith, **GM4HX** will be sorry to learn that he has been down with dysentry and malaria. He is now in a convalescent home somewhere in India. 4HX wishes to be remembered to GM3PB, 3LO, 4BK, 4NQ and 8RU.

● Ft./Sgt. Vincent Richardson, **G4HG** writing from Mehrabad, Persia, gives some interesting views regarding the prices charged for valves and components. "American tubes of the 6SK7, 6V6 types are running in the region of £4 10s. 0d. each. As for loud speakers they cost between £8 and £10 a piece—not depending on quality and make but on more or less on the day of the week." He describes how he constructed a 2 ft. 6 in. horn speaker from old petrol tins. It has two small horns on top with a 2 oz. Capstan tobacco tin soldered on top of each after cutting a ¼ in. hole in the bottom. In the two tins lie two earphones. "It works wizard and the reproduction from a powerful superhet is as good as can be expected. We are considering sending it to Voigt Patents for wholesale production!"

● Sgmn. G. Kelsey, **4142** says the type 11 set is one of the most popular Army low power sets. On the subject of record breaking, R5 W.T. and R4 R.T. sigs. were recently obtained over a distance of 400 miles using a 4 ft. rod on a transmitter of similar power to the type 11.

● Ldg. Tel. V. A. Sims, **G5VS,** in a letter from H.M.S. Dunbar, asks that his thanks be recorded to Jack Brazzill, **G3WP,** and Dick Game, **BRS6692** for the hospitality they extended to him during his several visits to their part of the world. "A stranger in a strange land, if he is an amateur has only to hook up with one of the locals to find himself among friends and made at home." During recent trips G5VS has also met G2NT, 2BUV and W8NEB who are stationed near 3WP. He extends his congrats to 5XI, 5UK, 6AB and 6CT on their promotion to higher rank. Vic expects to be home on leave in September pending sitting an exam. for a commission as an R.D.F. officer. Letters should be sent *via* his temporary home address c/o G5SN, 4 Bridge Street, Maidenhead, Berks. Incidentally 5VS has been a Leading Telegraphist for three years—he was accidentally "demoted" in a recent issue!

● F./Lt. B. A. M. Herbert, **G2WI,** writing from P.O.Box 250, Sidney, British Colombo, invites members in Western Canada to communicate with him. G2OH and 3MG are with him. He wishes to be remembered to any of the W.D. crowd who were in No. 1 Technical Wing in the old days and sends greetings to G2NK, 3BR, 4DC, 4DD, 8NR and 8RN.

● A.C.1 Kenneth Turner, **5132,** would be glad to contact any member who finds himself at 19 O.T.U. He can be found in Hut 4. A small Society has been formed at the station.

R.S.G.B. Prisoners of War Fund

DONATIONS.—The General Secretary acknowledges with thanks, on behalf of Council, receipt of donations from:—F. A. Binden, G8LX, 5s.; From the Far North per GM2NQ, £1 7s. 6d.; P. Marten, 5780, 2s. 6d.; J. W. Mavis, ZE1JE, 7s. 6d.; J. G. Barnes, 6618, 15s.; C. Young, G2AK, £2 2s.; R. A. Catmur, 4822, 5s.; H. Millward, ZL2KN, 12s.; E. W. Wiskin, 4384, 5s.; G. A. Thomas, 5417, 5s.; R. Bradley, 4209, 10s.; H. Heighington, G4JB, 5s.; W. J. Davies, G3OR, 5s.; Mrs. D. Neale (in memory of Reg. Neale, G6GZ), £1 1s.; 2CNC and Office Friends, £3 15s.; E. J. Williams, G2XC, £1 1s.; H. P. Arnfield, G3LX, 10s.; R. H. Cook, 6196, 6s.; Anon., 7s. 4d.; L. Parnell, G8PP, 5s.; District 7 (Croydon), £1 15s. 6d.; Mrs. R. G. Norman, £1 19s.; Masteradio, £2 7s.; A. A. Goldie, BERS182, 7s. 6d.; A. G. Davies, G2PC, 2s. 6d.; Mrs. Leith, 10s. **Receipts to date, £892 3s. 4d. Expenditure to date, £413 12s. 10d. Balance in hand as at August 31st, £478 10s. 6d.**

News from the Kriegies

Walter Caughney, writing from Stammlager XXID/14 under date of May 20, reports the safe arrival of numerous parcels from the R.S.G.B. Fund. He states that "we have plenty to entertain us in our spare time—reading, football, table tennis, a dance band and an orchestra." He returns thanks to all who have contributed to the fund.

Are you serving in South Africa?

Mr. L. W. Ensor, ZS6BJ Honorary Secretary, Radio Amateurs Society, invites all members who are serving in South Africa to contact him at 143 Great Britain Street, Kenilworth, Johannesburg. (Telephone 32-1765. Buses 19, 32 and 39.) Regular monthly meetings of the R.A.S. are held in the city.

Congrats

● To Lt. Rowland Shears, **G8KW,** R. Signals, who has been mentioned in despatches for distinguished service in the field. He has served in the M.E. for the past three years.

● To Sgt. J. Williamson, **5099,** of Earlston, Berwickshire, now proud father of a son.

● To Sgmn. and Mrs. G. Kelsey, **4142,** on the birth of a daughter Jennifer, and to Sergt. and Mrs. J. H. Acworth, **6472,** on the birth of a son John Richard Michael.

BRITISH ISLES NOTES AND NEWS

District and Town Meetings

D.R.'s, T.R.'s and others are asked to arrange meetings at least seven days after BULLETIN publication date—nominally the 15th of the month. Due to distribution difficulties, coupled with the fact that a very large number of members living away from home have the BULLETIN redirected to a temporary address, some days may elapse before the current issue is received. If a meeting is fixed between the 15th and 22nd of a particular month a notice should appear in the *previous* month's issue.

Details of forthcoming meetings should be sent to reach Headquarters not later than the 27th of each month. The details should be set out on a separate slip of paper or on a post-card, and should be arranged exactly as shown in the panel published on page 44.

DISTRICT 1 (North Western)

D.R.: H. W. Stacey (*G6CX*), *"Sandleas," Eddisbury Road, West Kirby, Cheshire. Hoylake* 337.

Bolton.—On July 25, several Bolton members attended the Ashton group meeting. An enjoyable afternoon ensued and thanks are due to the Ashtonians for their grand hospitality on this occasion.

Due to inclement weather, only five members attended the August meeting. 6591 a new Service member was welcomed to the district.

5542 joined the Navy in July and is now believed to be somewhere on the east coast, getting accustomed to the change from Utility to bell bottom trousers.

The next meeting will be at 2DVQ, 32 Bromwich Street, Bolton, at 2.30 p.m., on Sunday, October 3. Service members will be welcomed. (*via* 2DVQ.)

G6CX.

DISTRICT 2 (North Eastern)

D.R.: C. A. Sharp (*G6KU*), 316, *Poplar Grove, Gt. Horton, Bradford. Bfd.* 10772. *Scribe: H. Beadle* (*G8UO*), 13, *Chandos St., Keighley.*

G6MY is at present in GM. 5YV is still obtaining new members—6QO, 4PL, 5MW, 3XQ, and two BRS are among the recent recruits. A hearty welcome is extended to all. 6XT (R.A.F.) has found a shop in London which can supply all the radio parts he requires. 8CB is employed at an Admiralty establishment. 4142 is disappointed because his leaves never coincide with the dates of P.D.M's. Congrats to Cpl. and Mrs. H. Crowther, G3HA, on the safe arrival of Brenda Margaret on July 1. 3HA, writing from North Africa wishes to be remembered to 2SU, 4GJ, 4JB, 6BX and all old friends in the Bradford area. 2VO is welcomed back into the fold. He has great plans for post-war activity and hopes to put out some good signals from his station: his YL is a Radio Op. in the W.A.A.F. 4412 and 5GJ recently had lunch together at a coastal town.

Will members please note that Heckmondwike has been added to 5YV's territory? He is now T.R. for Morley, Batley, Dewsbury and Heckmondwike. The Scribe requires the address of H. Simpson, 2BXS who was at one time associated with the Bradford Short-Wave Club.

Sheffield members will be pleased to hear that 4KW, previously reported missing, is now known to be safe but a prisoner in Japanese hands. (Details to H.Q. please.—ED.). 2LT received only one reply in response to his request for support for a local meeting so nothing can be done at the moment. G8UO.

DISTRICT 3 (West Midlands)

D.R.: V. Desmond (*G5VM*), *The Chestnuts, Gilbert's End, Worcs. Scribe: E. J. Wilson* (2FDR), 48 *Westbourne Road, Olton, Birmingham.*

Birmingham.—No official meeting of M.A.R.S. was held last month, but an interesting informal discussion on gramophone record reproduction took place on Sunday, August 8.

General.—S./Ldrs. Maurice Brookes, G5OI and Geoff Mason, 5BR are still serving as Signals Officers in the Middle East and with them is F./O. Stanley Mason, 61X—all of Sutton Coldfield. G5OI and 5BR both "Early Birds" have visited no less than nine countries since September, 1939. They attended the Cairo Conventionette last May where they met Cpl. Davies, 5JY. All wish to be remembered to old friends in District 3. 5BR has heard from Lt. Derek Mattey a P.O.W. in Italy. L.A.C. Surman, 4045 seems to be enjoying himself in Salisbury, S. Rhodesia. He recently visited a new R.S.G.B. member (George Alexander) but finds it difficult to contact other local amateurs.

News has been received from A.P.O. R./Mech. L. Allen and P.O. Tel. R. H. Cook, both of whom have been kept busy on the high seas. Mrs. Cook presented her husband with a daughter on August 1.

W. E. Fowler, 2481 of Leek, having been called up hopes to get into Signals. He was, in pre-war days a keen 56 Mc/s. enthusiast. 2FDR.

DISTRICT 4 (East Midlands)

Deputy D.R.: A. E. Clipstone (*G8DZ*), 14 *Epperstone Road, West Bridgford, Notts.*

Derby.—G2OU reports visits from 8SI, 2CVV and 2DMT. 4600 (N. Africa) would like to hear from members living near his home town, Matlock. He has with him GM2FY and 2CJL.

Nottingham.—Our number one Radio Quiz having proved a great success it was decided to continue them at future meetings. Team A (3DG, 2AOO, 6748 and 6053) beat team B (2FXY, 4071, 6414 and P. Collins) by one point in twenty-two.

6748 has submitted to Headquarters details of his signal generator-B.F.O. unit mentioned in August notes. 2AOO is thanked for preparing the drawings.

The next meeting will be held at 6.30 p.m. on September 26, at 2AOO, 78 Henry Road, West Bridgford (No. 11 'bus from the Old Market Square, alight at George Road).

DISTRICT 5 (Western)

D.R.: R. A. Bartlett (*G6RB*), 31 *King's Drive, Bishopston, Bristol. Bristol* 46960.

Swindon.—In response to the appeal made last month the D.R. has received two welcome letters regarding activities in this area. The first comes from G3JO (R.A.F.) who has been undergoing a course at Marconi Wireless College, Chelmsford. By the time these notes appear he expects to be back at his station near Shrewsbury. He reports meeting 6LB at Chelmsford and gives news of other Swindon members:—G3NC is near Dover, 2CGN near Leighton Buzzard, whilst 2BUJ was on leave recently.

A. D. Spackman, BRS5651, writes "What about it, Swindon?" If members will support local meetings they should get in touch with him. His address is 63 Salisbury Street.

Bristol.—The next meeting will be held on Sunday, September 26, at 17 Colston Avenue, Centre.

G2IK stationed in London gets home occasionally but cannot attend local gatherings. He sends 73 to all old friends. G6RB.

DISTRICT 7 (Southern)

D.R.: W. E. Russell (*G5WP*), *Milestones, Mayford, Woking, Surrey. Woking* 1589.

Croydon.—The August meeting was supported by an attendance of 24 including 2FI, 2HP, 2LW, 2KU, 2RD, 2VB, 3DF, 3FK, 4NI, 5BT, 5PY, 6NF, 2HHD, 1545, 3003, 3868, 4324, 4603, 4814, 5317, 5545, 6064, 6620 and 2DP. We were very pleased to welcome the President and sorry that he cannot manage to get along more often. The meeting was given over to a talk by F. G. Hoare, 2DP, on Direction Finding as applied to the weather, which was greatly appreciated by all. A gadget put up by 3FK was raffled and the P.O.W. Fund benefited by the sum of 15s. 6d.

At the special meeting held on August 22, 12 members and one visitor attended. The sale was a success and Mrs. Norman wishes to thank all concerned. (*Via* G2DP.)

Coulsdon.—Congrats to 8TB and his wife upon the safe arrival of a junior op. on the 7th ult. 2KU has taken up the noble art of cookery in his spare time. A welcome to the District is extended to GM6MS who has come from over the border; also to 6433, 6515, and 6536—all new members. (*Via* 3003.)

Bournemouth.—Hearty congrats to the T.R., 2HXO, who in spite of not enjoying the best of health for the last year or so, has just taken his LL.B. Congrats also to Paul Gifford, 4694, on his safe return from VE and also on his commission. 4363 is now a Sgt. in the R.A.F. stationed in the West.

6122, reporting from West Africa, comments on the fact that he has erected his dipole on the exact spot where all static originates.

Southampton.—Dr. Zepler, University College Lecturer in Radio, gave a talk on some of his memories of 15 years of Commercial Radio to an appreciative audience of U.C. Amateur Radio Society and R.S.G.B. members at the meeting held on August 15. A discussion followed on British versus American receivers. 5LR, 5LT, 2HCD, 5554, 6447, and 6571 represented the Society and extend thanks for the hospitality enjoyed.

6447 and 6448 are both constructing midget A.C./D.C. sets. (*Via* 6447.)

General.—4268 reports from a hospital in North Africa where he is recovering from malaria. 3UY states that 3VB has arrived safely in Gib. G5WP.

DISTRICT 8 (Home Counties)

Deputy D.R.: L. W. Jones (*G5JO*), 16 *Leys Road, Cambridge. Cambridge* 3406.

With the exception of a few 'phone calls from members, no special reports have been received. It is believed that a number of visiting amateurs are in the district from time to time; members are asked to try and get in touch with them and to inform the D.R. Attention is called to the meeting to be held on September 25 at the Milton Arms Hotel, Milton Road, Cambridge, at 3.45 for 4 o'clock. Tea will be served and ladies will be welcome; the lounge will be available for part of the evening, and it is hoped as many as possible will attend for an interesting discussion. Those who expect to attend are asked to let G5JO know by September 22 in order that catering arrangements can be made. No individual invitations are being sent out, but members are invited to inform anyone who is interested in amateur radio that they will be most welcome. Please bring along your list of components for disposal or required. Perhaps you will be doing somebody a good service. It will depend upon the success of this meeting whether any more are held before Christmas. G5JO.

DISTRICT 11 (North Wales)

Deputy D.R.: C. Spillane (BRS1060), "Woodside," Meliden Road, Prestatyn.

The meeting held at BRS4762 on August 22 was not very well attended although GW4CX, BRS2731 and 4444 travelled some distance to support the gathering. Others present were G2GZ, GW3CF and 5122. GW4CX brought along some good items of gear for the auction, but it was decided to reserve this for the next meeting in view of the small attendance. 2731 demonstrated the midget receiver he has built, and 2GZ (ex-BRS177) gave an interesting account of his pre-war activities and future hopes.

Another meeting will be held at "Vale View," Meliden Road, Prestatyn, on September 26, at 3 p.m., when it is hoped that more members will attend, and so justify their continuance. An auction of gear will be held. 4023 in an air letter from Libya reports the founding of a radio club in his unit with about 10 members including G4LW and 2DHV. He sends his 73 to local members. 2DAH is now stationed at a port in District 1.

G3IR is still in G1, and 3044 is now believed to be in GM. 4410 is with an air borne signals unit in B.N.A.F. GW6KY still in M.E. is now senior signals officer of his group.

Members requiring the address of any service member mentioned above should write 1060. BRS1060.

Forthcoming Events

Sept.	19	District 14 (Chingford Section), 3 p.m., at G8DG, 8 Bosgrove, The Ridgway, North Chingford. (38 Bus to Endelbury Road.)
,,	24	District 12, 7.30 p.m. Informal Dinner Party at The Cock, Cockfosters (see District 12 notes).
,,	25	London Meeting, 2.30 p.m., at the I.E.E. "Development of Amateur Radio," by Mr. S. K. Lewer, B.Sc. (G6LJ).
,,	25	District 8, 3.45 p.m., at Milton Arms Hotel, Cambridge.
,,	26	District 11, 3 p.m., at BRS4762, "Vale View," Meliden Road, Prestatyn. A discussion will take place on the arrangements for future Meetings, followed by an auction of gear.
,,	26	Scotland "A" District, 3 p.m., in Royal Technical College, George Street, Glasgow, enter by Montrose Street.
,,	26	District 15, Dinner and Social. Meet in The Oak Room, Palladium Cinema, Ealing Broadway, at 5 p.m. Dinner 7 p.m. prompt. (District, G.W.R. and Central London Railways, Buses 65, 83, 97, 112, 211, Trolleys 607, 655.)
,,	26	District 5, 3 p.m., at 17 Colston Avenue, Centre, Bristol.
Oct.	3	District 7 (Croydon Area) and District 13 South Central and Eastern Areas), 3 p.m., at Croydon Y.M.C.A., North End, West Croydon.
	3	District 12 (St. Albans Section), 3 p.m., at BRS3412, 18 Sandfield Road (turning off main Hatfield Road between St. Paul's Church and Rats' Castle P.H.).

DISTRICT 12 (London North and Herts)

D.R.: S. Buckingham (G5QF), 41 Brunswick Park Road, New Southgate, N.11. Enterprise 3112.

A most enjoyable meeting was held at the home of G6LL, Cuffley, on Sunday, August 29. Thanks are recorded to our hostess, Mrs. J. W. Mathews, for a very pleasant afternoon. The next meeting will be held at the Cock Inn, Cockfosters, on September 24, at 7.30 p.m., those wishing to take the evening meal should notify G5QF by the 19th inst. Congrats are offered to V. Upton, 3106, on his promotion to pilot officer.

St. Albans.—The first war-time meeting held in the town on August 1 was notable for that fact that no St. Albans members attended! However, 2DWM (Edgware), 3NR (Kings Langley), 5QF, 4502 (Harpenden), 5065 (Luton) and 3412 enjoyed a good rag-chew on topics ranging from 56 Mc/s. to diversity reception. Tea (for which thanks are due to the parents of 3412 and his Y.L.) and a darts match in which 5QF, 3NR and 5065 (The Visitors) beat 4052, 3412 and his father (St. Albans) by 5 games to 1, helped us to pass away some pleasant hours. The D.R. revealed himself a master on the finishing doubles!

Another meeting has been arranged for October 3 at 18 Sandfield Road, so please make an effort to attend.

(*via* BRS3412) G5QF.

DISTRICT 13 (London South)

South Eastern and Central, S. E. Langley (G3ST), 62 Dumbarton Road, S.W.2.

The last joint meeting with District 7 held at the Y.M.C.A., Croydon, was very well attended (see District 7 notes for details). BRS4324 has built an oscilloscope. W9EEZ recently visited G3ST and gave some interesting information about his gear at home. 3CI also called and regrets that his leaves do not coincide with meetings; he sends 73 to all friends. 2GZ, who reports by mail from N. Wales, seems to be progressing very well; army life evidently agrees with him, especially the gentle art of brass pounding. G3ST.

DISTRICT 14 (Eastern)

Scribe: L. J. Fuller (G6LB), 167 Galleywood Road, Chelmsford, Essex. Telephone: Chelmsford 3929.

Chingford.—The following attended the meeting held at 5726 on August 22:—G8DG, 2FTH, DXL, DWV, 4215, 4249, 5726, 6303, 6599. The decisions reached at the June Council Meeting, relating to the Editorial in *Wireless World*, and to THE BULLETIN questionnaire, were discussed; the meeting expressed its approval of the wise steps taken. Congrats are offered to 2FTH and 6599; the former has obtained the Higher National Certificate in Mechanical Engineering, and the latter a 1st Class C.G.I. For date of next meeting see Forthcoming Events. G8DG.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

D.R.: H. V. Wilkins (G6WN), 539 Oldfield Lane, Sudbury Hill, Greenford, Middlesex. Byron 3369.

West London.—Those present at the August District meeting were treated to a very interesting lecture, given by G2MQ, on a single valve multivibrator which he has recently developed. Quite a number of questions were asked by those present: SP1HA, OK2GO, 5LN, 5LU, 6RW, 6WN, 8KZ, 2ADL, 2842, 5533. We thank MQ for the lecture and Mr. and Mrs. 5LN for their hospitality.

Don't forget the District Dinner—send your reservation to the D.R. at once.

High Wycombe.—Those present at the last meeting included G2RL, 6IF, 2ADL, 4781, 4782, 5666. A 112 Mc. receiver was produced for inspection. Mr. and Mrs. 6IF are thanked for their hospitality.

Aylesbury.—Thanks are extended to Mr. Okum for his paper "Plastics in Radio" which he read at the August meeting. Time did not allow him to answer all the questions put forward. Those present included G8BW, 6017, 6018, 6019, 6356, 6357, and six new members to whom a welcome is sent. 8BW has received a letter from G3BP's father to say that he is a P.O.W. in Italy. (G3BP has been receiving R.S.G.B. P.O.W. Fund parcels for two years. He has recently been transferred to Germany.—Ed.)

Edgware.—The E.S.W.S. letter budget arrived recently and its contributors include 2AI, 2IM, 2QY (the sponsor), 3HT, 4KD, 4JU, 6PM, 6WN, 6CL, GM3LO, Messrs. Dyer and Filkin and Miss G. Bell. It makes very interesting reading.

General.—In an Airmail G4AR tells of being in "Civies" again in a country which we all wanted to work in peace-time! Still a staff sergeant, he reports fit and well (see K. and B.). 5JL complains of flies and heat in North Africa and talks of dips in the "briney." 5NR is on war work at St. Albans while 2FUX (R.A.F.) is now near Wolverhampton on a pre-com. course. (Now commissioned as Pilot Officer and stationed near Richmond, Yorks.—Ed.)

DISTRICT 17 (Mid East)

D.R.: A. C. Simons (G5BD), Admiralty Road, Mablethorpe. (Phone 69.)

Last month's request has found 1060, 5167 and 5317 as birds of passage in the District; the latter had a "dry" with the D.R., the others, being within skip distance, may do the same. 2BUV still fit in Iceland hopes to see G before Christmas. 5LL is fit and well in Sicily. 5933 sends news from Gainsboro' that G3OS, 3WB, and 4629 are standing by and that 5710 is serving with the R.A.F. G5BD.

DISTRICT 18 (East Yorkshire)

District Scribe: S. Davison (G6SO), 10 Sidney Street, Scarborough.

Scarborough.—Sympathies are extended to Allen Edwards, 1420, on the sudden loss of his mother.

Beverley.—3271 has received visits from A.C.1 Beeby and Sgt. T. Ferguson (Signals), and inquiries *re* the proposed meeting

★ London Section Meeting ★

S. K. LEWER, B.Sc (G6LJ)
will deliver a lecture entitled

THE DEVELOPMENT OF AMATEUR RADIO

at a Meeting to be held on
SATURDAY, SEPT. 25th, 1943
at
The Institution of Electrical Engineers
SAVOY PLACE, Victoria Embankment, S.W.1
COMMENCING AT 2.30 P.M.

from G. A. Ayers, 6379 and 3PL, but the general response is poor. It is hoped that meetings will be held provided a little more interest is evident. We again appeal to members, especially those in the Services, to get in touch with 3271. His address is D. Armstrong, 24 York Road, Beverley. G6SO.

DISTRICT 19 (Northern)

D.R.: R. J. Bradley, G2FO, 36 Raby Road, Stockton-on-Tees.

The District silence was broken last month by a letter from 4OI of Eston, at present in India with the R.A.F. So far 4OI has failed to locate any amateurs in his particular part of VU. He sends 73 to all and would appreciate letters from Members and especially from his old friend 3UG. G2FO.

HAVE YOU BOOKED YET ?

FOR

District 15 Dinner and Social

to be held in the

OAK ROOM, PALLADIUM CINEMA, Ealing Broadway,

On Sunday, September 26, 1943,

From 5 p.m. to 9 p.m. (Dinner at 7 p.m.)

Inclusive charge 4/6 per head, payable in advance

LADIES ARE INVITED

Reservations to Mr. H. V. Wilkins, G6WN, 539, Oldfield Lane, Sudbury Hill, Greenford, by September 22nd latest. Service members should telephone Byron 3359, if on leave around that time. Every effort will be made to provide last minute accommodation.

Northern Ireland

D.R.: J. N. Smith (GI5QX), 19 Hawthornden Drive, Belmont, Belfast. Telephone: Belfast 63323. T.R.: R. Holden (GI5HU), 260 Grosvenor Road, Belfast.

Congrats to J. Adams, R.E.M.E. (GI5AJ), on his promotion to the rank of Lt.-Col. ZL1GX, W9EEZ and BRS4398 visited the D.R. during the month, and were welcome guests. 5QX has now had personal QSO's with five of his W.B.E. contacts, and needs S.A. to complete the circle. Activity at the Y.M.C.A. Club has not been great lately, but it is hoped that the winter months will see a resumption to normal. A good programme has been prepared for the entertainment of all comers. GI5QX.

Scotland

Scottish Records Officer: J. Hunter (GM6ZV), 51 Camphill Avenue, Glasgow, S.1. Langside 237.

"*A*" *District.*—In succession to GM4JO, David Macadie, GM6MD has taken over as D.O. of "A" District. There was a better attendance at the August meeting when G4KS, 5301 and 6153 were welcomed as visitors. GM3AR delivered an interesting talk. The next meeting will be held on September 26, at the usual time and place.

"*H*" *District.*—Congrats to GM4GK on gaining his second "tape." 3LO is a corporal in R. Sigs. and sends 73 to all. 8MQ, our most regular correspondent and 2BJI, corporal in R.A.F., both report fit. 5320, a nomad R.A.F. sergeant, with experience of 30 stations behind him, is in touch with GM5YX, 4JO and G6YR. He states that G4BJ is now in India. 3LG attended the December and May Conventions in Cairo, and is working alongside 2YK. He sends 73 to all in "H." 3XO regrets his (we hope, temporary) relinquishment of R.S.G.B. membership; we wish him good luck during his forced sojourn abroad. The D.O. expresses thanks to all "H" members for their enthusiastic co-operation and contributions to the District.

"*Far North.*"—G6LC has returned from the South—complete with screwdriver! 5668 has left us; we wish him the best of luck. All Far North members are to be congratulated on their fine donation to the R.S.G.B. P.O.W. Fund sent *via* 2NQ.

GM6ZV.

The Year's best Letter

The following gem was received by Headquarters from a Corporal in the R.A.F.:—

"I would like if you could give me information regarding a commercial broadcasting station. Is it possible to obtain a licence to operate a Commercial Broadcasting Corporation station with low power transmitter 200-500 watts. This of course would not be allowed during war time. The broadcast of sports news, local news, because this station would be used only for one State or Shire, by that I mean the news of happenings in Shropshire, if the station was situated in Shropshire. The transmissions would not be meant for all Great Britain, just for listeners in one particular shire.

"I wrote to you because your Society appears to lead in the way of radio and you will have the dope on what is allowed in the way of transmitters especially being a Ham Radio Society."

Letters to The Editor

Nomenclature

DEAR SIR,—I was glad to read in par. 6 of the Résumé of the June Council Meeting that the President had made reference to the misleading use of certain amateur terms.

I have always felt that, apart from the use of recognised codes and abbreviations in international communications, it is a great mistake for any branch of science to develop an exclusive language.

In many constructional articles of recent years there has been a tendency on the part of some writers to use this "slanguage" to such an extent as to be incomprehensible to the general public or even to the beginner. The pity is that this is quite unnecessary as it would take very little more time and space to produce a readable and grammatically sound article.

Recently, and particularly during the war, the public has become increasingly interested in scientific matters and if this welcome and healthy interest is to be held and stimulated, scientific workers, not only in Radio but in all the applied sciences, must become less exclusive in habits and language.

Incidentally, arising out of par. 8 of the same Résumé, I wonder if in post-war plans it might be well to re-consider the use of the loose term "Amateurs" in reference to "Authorised Experimenters," many of whom are far from being amateur either in experience or in the professional sense.

Yours faithfully,
JOHN L. HORTON (2AHN).

China Amateur Radio League

DEAR SIR,—It gives us great pleasure to inform you that your Presidents' special broadcast on May 5 came over very clearly. Our annual convention was held as scheduled and we were happy to have so many QSL cards, photographs, and radio publications from you on display. But the exhibition had to be postponed until January 1, 1944, for lack of exhibits from other allied countries. We hope that this postponement will give ample time for those contributed items to arrive.

Yours sincerely,
U. T. HSU,
President,
China Amateur Radio League.

China Amateur Radio League,
172 Su Zen Sin Tsung,
Hsiaolungkam, Chungking.

Taking Stock

DEAR SIR,—The attention given in your August editorial to the war-time recruit to the ranks of amateur radio is most timely. There are many of us, especially those in the Services, whose work is mainly that of maintenance of a particular range of equipment, together with a fairly large amount of theory. The lack of opportunity, parts, and kit-bag space prevent much individual research and practical work in more usual radio matters.

DX, QSL and field days are to us only names. The interests, accomplishments and opportunities of peace-time operating could be expounded by the old hand, willing to show off his particular prize efforts. Even the efforts of Defence Regulations and the impounding of apparatus would not prevent such action being useful—and good publicity.

For myself, if any reader within easy reach of the new Headquarters would take on the rôle of mentor, I should be grateful for the opportunity of first-hand contact. (I am stationed in the London, W.C.1. area).

Yours faithfully,
C. W. S. (BRS5121).

(The writer of this letter is a L./Sgt. R.E.M.E.—ED.)

Hospitality Offered

Mr. R. C. Horsnell, **G2YI,** will be pleased to extend a welcome to any member who visits him at his new home, 80 Mayfield Drive, Caversham, Reading ('Phone: Reading 72871).

Mr. W. E. Nutton, **G6NU** 42 Richmond Road, Gillingham, will be glad to meet new members on Sundays up to 5 p.m. A post-card in advance is requested.

News from the Kriegies

News is to hand from Rotura, New Zealand, that Mr. E. Blomfield, **VS2AL** is a prisoner of war in Malaya. He was serving with the F.M.S.V.F. at the time of the capitulation of Singapore.

Side Slip

The diagrams illustrating half wave and full wave rectification (Figs. 3a and b) were reversed in Part II of the article entitled "A Valve Vade Mecum" published last month.

Congrats

● To B. R. Arnold, **G3FP,** of Streatham, London, on his recent marriage.

● To W. G. Soar, **BRS5406,** who was married at Beeston on August 14 to Miss J. L. Minson.

HEADQUARTERS CALLING

COUNCIL 1943

President:
ALFRED DUNCAN GAY, G6NF.

Executive Vice-President: E. L. Gardiner, B.Sc., G6GR.

Honorary Secretary: H. A. M. Clark, B.Sc., G6OT.

Hon. Treas.: A. J. H. Watson, A.S.A.A., G2YD.

Honorary Editor: Lt. James W. Mathews, G6LL.

Immediate Past President: Arthur E. Watts, G6UN.

Members: F. Charman, G6CJ, D. N. Corfield, D.L.C.(Hons.), G5CD, G. A. Jessup, G4HG, W. A. Scarr, M.A., G2WS, E. H. Simmonds, G8QH, Wing-Com. J. Hunter, G2ZQ, Wing-Com. G. M. R. Scott Farnie, GW5FI.

Co-Opted Members: S. K. Lewer, B.Sc., G6LJ, W. H. Matthews, G2CD, W. E. Russell, G5WP.

General Secretary: John Clarricoats, G6CL.

July Council Meeting

Resume of the Minutes of a Council Meeting held at New Ruskin House, Little Russell Street, W.C.1, at 6 p.m. on July 26, 1943.

Present.—Messrs. A. D. Gay (President), E. L. Gardiner, H. A. M. Clark, A. J. H. Watson, D. N. Corfield, G. R. Scott Farnie, S. K. Lewer, W. H. Matthews, W. E. Russell, W. A. Scarr and J. Clarricoats (General Secretary).

Apologies.—Messrs. A. E. Watts, E. H. Simmonds, G. A. Jessup, F. Charman and J. Hunter.

1. It was unanimously resolved that 188 applications for membership, including three for Associate membership, be accepted. It was recorded that 35 applications had been supported by references and that the remainder had been sponsored by Corporate members. Two resignations were accepted.

2. It was reported that a further sum of £500 had been invested in 2½ per cent. National War Bonds, 1951–3.

3. It was reported that approximately 13,000 copies of the ninth printing of 20,000 copies of the Handbook (due to be delivered during August) had been booked and that 25,000 copies of the second printing of 30,000 copies of the Supplement had been sold. It was unanimously resolved to place orders for the printing of a further 30,000 copies of each publication.

4. The autumn lecture programme for meetings at the I.E.E. was considered.

5. The Secretary gave a brief report of the work undertaken in establishing Headquarters at New Ruskin House. It was agreed to engage a junior clerk.

6. W./Cmdr. Scott Farnie reported that the Signals Directorate, R.A.F., M.E.F., had, during his spell of duty in that theatre of war, officially encouraged the establishment of Amateur Radio Societies throughout the Middle East. He further stated that the C.S.O., M.E., had reported very favourably on the work undertaken by airmen and officers who had had pre-war experience as radio amateurs.

The meeting closed at 9 p.m.

London Section Meeting

Mr. S. K. Lewer, G6LJ (Deputy Honorary Editor) will lecture on "The Development of Amateur Radio" at the first meeting of the 1943–4 session to be held on Saturday, September 25, at the Institution of Electrical Engineers, Savoy Place, London, S.W.1, commencing at 2.30 p.m. The I.E.E. will be open for informal discussions from 2 p.m.

I.E.E. Wireless Section Meetings

Mr. T. E. Goldup, newly elected Chairman of the I.E.E. Wireless Section, will deliver his inaugural address at the meeting of the Section, to be held in the Lecture Theatre of the Institution of Electrical Engineers on October 13. On November 3, Mr. J. Kemp will read a paper entitled "Wave Guides in Electrical Communication—a survey of public researches."

Society members are cordially invited to attend these meetings. Tea will be served from 5 p.m.

Bulletin Honoraria

The Council has pleasure in announcing that an Honorarium has been awarded to each of the following members who contributed to Volume 18 of THE R.S.G.B. BULLETIN:—

Class I Awards.—Messrs. D. N. Corfield, G5CD, A. H. Mason, GM6MS, A. Hine, BRS44438, and A. J. Bayliss, G8PD.

Class II Awards.—Messrs. J. Shankland, GM8FM, C. Coates, G5CS, H. V. Griffiths, ex G6FF, and "The Workshop Man."

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Delivery can be expected in about 3 months from date of order. Service addresses must not be used and cash must accompany each order.

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THE LIGHT RECEIVER—(*continued from page* 41)

sending end a neon lamp is connected to the output of a speech amplifier, would the light beam not vary in intensity at the speech frequencies, thus enabling speech to be reproduced in the headphones of the "Light Receiver"?

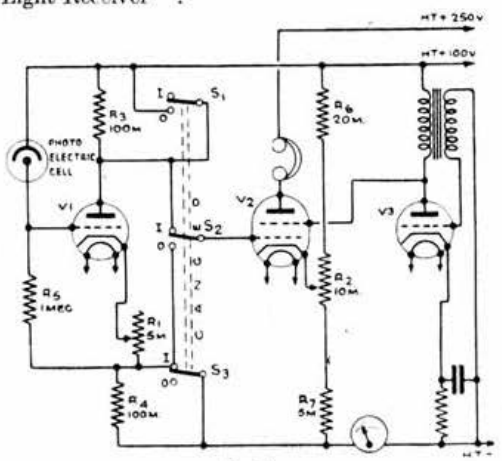

Fig. 2.
Circuit diagram of the "Light Receiver." Although values of resistances are specified they are only suggested values. Position "O" of S1, 2, 3 is for reception of plain Morse and position "I" for "Inverted" Morse.

Could a neon or other lamp be constructed to radiate cloud-piercing infra-red rays, invisible to the human eye? Could several channels be used on the same beam by employing colour filters and/or polarised light? Can any reader evolve a system of transmitting and receiving inverted speech? And lastly, could a neon bulb, controlled by frequency modulated R.F., be used to provide speech over a beam of light of uniform intensity?

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For those whose business it is to study the many problems relating to accumulator charging this book will prove of much service. J. C.

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