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

BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

- THE SYNTHESCOPE
- PLANNING THE POST-WAR AMATEUR STATION
- D.C. SUPPLIES

ANNUAL REPORT OF THE COUNCIL

OF THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN

for the Year ended 30th September, 1943

INTEREST in the scientific aspects of Amateur Radio continues to increase, and many members are preparing for a revival of their experimental activities. The need for careful planning has already provided the subject for one London meeting and others will be arranged as the opportunity occurs.

Membership

During the year the membership increased from 4,480 to 5,835—the highest nett annual increase in the history of the Society. The membership strength is now 2,500 in excess of the peak pre-war figure, and growing rapidly each month.

A high proportion of newly elected members are serving with the Armed Forces of the Crown.

The Council records its thanks to all those who have co-operated in the task of making known the work of the Society.

New Headquarters

In consideration of the steady increase in membership and the growing need for more spacious office accommodation, the Council, during the summer, took steps to acquire suitable premises for Society Headquarters which would be easily accessible to members visiting London, and would at the same time relieve the General Secretary of the strain involved in conducting the affairs of the Society in his own home.

After a careful survey of available accommodation, a suite of rooms, in a modern building in the Holborn area, was secured on a three years agreement with the option to renew for a further four years at the same rental. Due to war conditions it is not yet possible to offer at Headquarters the full amenities which are envisaged in the future, but members may be assured that at the earliest opportunity the Council will endeavour to create the club-room atmosphere which they believe to be essential for the future well-being of the Society.

Due to the increasing volume of Society business, coupled with shortage of staff, the General Secretary is unable to devote more than a small portion of his time to entertaining visitors, but the Council desires to make it clear that members will always be welcomed at the new Headquarters during normal office hours. Those who wish to discuss business matters with the Secretary should, whenever possible, make an appointment in advance.

Meetings

The Council is appreciative of the efforts made by District and Town Representatives in maintaining local interest by arranging regular meetings. One Provincial District Meeting was held during the year (at Leeds) whilst a well supported meeting was held at Cranwell R.A.F. station. The President and General Secretary attended both meetings.

Social functions were held in several London and Provincial Districts, but it was not considered desirable to organise a National event.

The Council wishes to record its thanks to those Service members who have undertaken the task of organising regular meetings at R.A.F. and Army Centres. Much good work has been achieved.

Technical Lectures

The following technical lectures were delivered at meetings of the Society held at The Institution of Electrical Engineers, London.

October 31, 1942: "**Radio Mathematics,**" by Flight Lieutenant T. R. Theakston, B.Sc. (2DBK).

November 28, 1942: "**V.H.F. Technicalities,**" by Flight Lieutenant J. N. Walker (G5JU).

December 19, 1942: "**Frequency Modulation,**" by A. J. Bayliss, B.Sc. (G8PD).

January 30, 1943: "**Cathode Coupled Circuits,**" by A. Hine, B.Sc. Tech. (BRS4438).

February 27, 1943: "**Diversity Reception,**" by H. V. Griffiths (Engineer-in-Charge, B.B.C. Measurement and Frequency Station).

March 27, 1943: "**More about Mathematics,**" by Flight Lieutenant T. R. Theakston, B.Sc. (2DBK).

May 1, 1943: "**Planning the Post War Amateur Station,**" by P. W. Winsford (G4DC).

May 29, 1943: "**The Eddystone Range of Superheterodyne Receivers,**" by R. P. Heatley (G5OH).

September 25, 1943: "**The Development of Amateur Radio,**" by S. K. Lewer, B.Sc. (G6LJ).

The thanks of the Council are recorded to those who delivered lectures, and to all who contributed to the subsequent discussions.

Silent Keys

The Council records with deep regret the names of the following members who have been killed, or have died, whilst serving their Country.

Sgt. Pilot R. T. Batchen	GM5GK	..	R.C.A.F.
Sgt. F. A. Beane ..	2CUB	..	R.A.F.
A.C.2 D. D. Broderick ..	5446	..	,,
F./O. S. W. Clark ..	2AMW	..	,,
Sgt. E. Cowan	5019	..	,,
2nd/Lt. A. Dempsey ..	5778	..	R. Signals
L./Tel. R. Frew ..	GM8FR	..	R.N.
F./Lt. G. A. Houghton	G3AG	..	R.A.F.
F./Sgt. J. Huschman ..	GM6MZ	..	,,
Sgt. E. C. Ibbotson ..	5212	..	,,
Cpl. F. N. Sloss ..	6168	..	,,
Lt. M. F. Somerville ..	G5SV	..	R.N.
L./Cpl. F. Sutton, B.Sc.	2DJV	..	R. Signals
L.A.C. B. J. Thrupp ..	4899	..	R.A.F.
P./O. J. E. Walford ..	2FVN	..	,,
Sgt. J. S. Whitehead ..	5138	..	,,
Capt. Gorry Wilson ..	VS1AN–G4FG		Test Pilot

* * *

Mr. Arthur Tomlinson, ZD2H–G2QN, was killed by enemy action en route to England.

* * * *

In addition to the names listed a number of members have been reported missing.

Society Publications

Although it has not yet been found possible to increase the size of the Society's Journal, due to the continuation of paper restrictions, every effort has been made to offer members a sound, well-balanced issue each month. As the result of opinions expressed by members in answer to a Questionnaire published during the year, the Council approved certain modifications to the make-up of the R.S.G.B. BULLETIN. The decision to devote additional pages to technical contributions without omitting the topical features such as District Notes, "Khaki and Blue" and "Headquarters Calling" has met with the general approval of the membership.

Demands for *The Amateur Radio Handbook* and *Radio Handbook Supplement* have continued. Delays, due to paper difficulties, have occurred in the publication of reprintings, but these are unavoidable under existing conditions. It is gratifying to record that the majority of sales were to Service personnel who report that both publications are of value to them in their training.

The Council regrets that due to paper rationing, it has again been necessary to limit the extent of advertising space in the R.S.G.B. BULLETIN. Those advertisers who

have continued to take space are cordially thanked for their support. It has not been possible to accept advertising for recent reprintings of the Handbook and Supplement.

Technical Contributions

The standard of technical contributions to the Society's Journal has been maintained at a high level. Outstanding examples of the Council's desire to present advanced radio technique, were provided by the publication of the series of articles entitled "Communications on the Centimetre Waves" by Mr. James Shankland, B.Sc. (GM8FR), and the papers read at London meetings by Messrs. Bayliss (Frequency Modulation), Hine (Cathode Coupled Circuits), and Griffiths (Frequency Measurement).

The Council wishes to record its appreciations of the efforts of all members who made technical contributions to the Society's Journal. It is regretted that for reasons of National security, it is not yet possible to record many of the more recent developments with which members have been associated.

Experimental Section

Considerable progress has been made in connection with the recently formed V.H.F. Group led by Mr. H. H. Phillips (GW4KQ). Letter Budgets have been circulated and much useful information accumulated. Useful work has also been achieved by the Receiver Group led by Mr. H. R. Heap, B.Sc. (G5HF). The general direction of the Section has again been in the capable hands of Mr. D. Heightman (G6DH).

Post-War Licencing Matters

The G.P.O. has indicated its agreement to the suggestion made by Council that ex-Service personnel who wish to obtain an experimental transmitting licence, shall, on their return to civilian life, be exempted from possible examinations in radio theory and/or Morse ability, provided they can produce evidence that during the war they served in an approved Radio trade. A list of trade categories which it is believed will meet the requirements of Morse aptitude and technical ability, has been presented to the G.P.O.

In connection with a suggestion made by the G.P.O. the Council is investigating the possibility of the City and Guilds Institute, London, establishing a special technical examination for other post-war applicants for experimental transmitting licences.

Assurances have again been given by the G.P.O. that, subject to the military situation then applying, experimental transmitting licences will be restored without unnecessary delay at the cessation of hostilities. A statement dealing with this and other post-war licencing matters, was published in the March 1943 issue of the Society's Journal.

Public Relations

Recognising the importance of keeping the public informed, through the press, of amateur radio activities, where these have a news value, the Council appointed Mr. E. H. Simmonds (G8QH) to serve as Public Relations Officer. A statement dealing with this important aspect of Society activities appeared in the April issue of the Society's Journal.

Prisoners of War Fund

In response to representations made by members it was decided as from December 1, 1942, to widen the scope of the R.S.G.B. Prisoners of War Fund to include those non-members who held at September 3, 1939, full or artificial aerial licences issued by the G.P.O. As from December 1, 1942, all donations have been used for the benefit of members and non-members alike, unless the donor clearly stated that the donation was to be used for members only. The balance of the fund in hand at November 30, 1942, including all donations received up to that date, was used for the benefit of members only.

During the year parcels to an average value of £1 each were sent each month to all members known to be in German and Italian prison camps. Similar parcels were sent to non-members who held a G.P.O. licence at the outbreak of hostilities. It is regretted that it has not yet been possible to send parcels to members held prisoner by the Japanese.

The thanks of the Council are again recorded to Mr. C. H. L. Edwards, G8TL, for the excellent manner in which he has administered the fund. Since its inauguration Mr. Edwards has despatched more than 1,000 parcels and written approximately 1,200 letters.

Congratulations

The Council extends its congratulations to all Service and Civilian Members who have been honoured by H.M. The King. A complete list of members who have been decorated during the war is being prepared.

Thanks

The Council records its thanks to the Wireless Section of the Institution of Electrical Engineers for their invitation to Society members to attend Section meetings. Thanks are also recorded to the President and Council of the Institution of Electrical Engineers for continuing to permit the Society to meet within the precincts of the Institution.

* * * *

The Society was honoured during the year by the acceptance of an invitation extended by the Council to Professor C. L. Fortescue (Immediate Past President, I.E.E.) to become a Vice-President. Dr. R. L. Smith-Rose (Immediate Past Chairman, I.E.E. Wireless Section) also honoured the Society by accepting Honorary Membership.

Council Attendances

The following is a list of Council attendances for the year ended September 30, 1943 :—

A. D. Gay	12	Maximum possible attendances, 12.
A. J. H. Watson	12	
W. A. Scarr	9	
H. A. M. Clark	8	
E. H. Simmonds	8	
A. E. Watts	8	
E. L. Gardiner	7	
G. A. Jessup	7	
G. R. Scott Farnie* ..	3	
J. W. Mathews*	2	
W. H. Matthews	11	Maximum possible attendances, 11. Retired December 31, 1942. Co-opted January 18, 1943.
S. K. Lewer	10	
D. N. Corfield	8	Maximum possible attendances, 9. Elected January 1, 1943.
J. Hunter	6	
F. Charman	5	
W. E. Russell	8	Maximum possible attendances, 8. Co-opted January 18, 1943.

* *Absent on Service duties.*

There were 12 Ordinary Council meetings during the year.

The Seventeenth

ANNUAL GENERAL MEETING OF THE SOCIETY

will be held at the

INSTITUTION OF ELECTRICAL ENGINEERS, SAVOY PLACE, VICTORIA EMBANKMENT, LONDON

on Saturday, December 18th, 1943, at 2 p.m. prompt

R.S.G.B. BULLETIN

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NEW MEMBERS, WELCOME !

OF some 2,000 new members we have elected into membership of the R.S.G.B. during 1943, it is safe to say that a large proportion are newcomers to the whole idea of amateur radio. From old hands they hear strange technical phrases, tales of "DX" exploits and "round tables," hints of old well-fought controversies. And amongst it all they feel, quite naturally, like new boys at school.

Well, these lines are written (by one who is not so much of an old-timer himself) to welcome these newcomers and, as it were, to do the honours.

Let us say at once that amateur radio—*real* amateur radio—is in abeyance. Of course, amateurs still talk and read about radio (what would stop them ?) and some who still have an odd moment to spare may be found tinkering with receivers. But the whole essence of amateur radio is *communication*.

One amateur, in ordinary times, may spend the greater part of his leisure at the work-bench, re-building and un-building his apparatus and spending but little time "on the air." Another may be content with any sort of transmitter and spend all hours ranging the world's ether for contacts. Still another may content himself with a small local circle of microphone friends and devote his energies to putting out the most perfect audio quality his means and skill allow. And yet another will focus his wits on devising ever new and better aerial systems. But the consummating moment of all their activities is when they establish contact with another amateur *via* ether, and so put theory to the test of practice.

There can be none of all this in war-time. So the first thing we can say to the newcomer is that all the good things are in store. . . .

Anyone who could follow the career of a typical radio amateur would see some such sequence of events as this. At first, a receiver (whose functioning is taken for granted) and an eager questing across the amateur frequencies for "far calls and lands remote." Then, a stage when the receiver dissatisfies and the owner begins to adapt it, add to it, rebuild it, in search of the elusive balance between sensitivity and selectivity. Next, and pretty soon, the dawning idea of contributing his own signal to the world-wide interchange he hears; followed by the assembly of a first (and perhaps primitive !) transmitter. Then a long tale of wreck-and-refashion, test and wreck, and the unsleeping desire to "get out" further, more clearly.

And then a pause. The frenzy of constructional activity gives place to something else. Our amateur is seen in his lunch-hour poring over books, making multiple calculations on bits of paper, sketching circuits. . . . He is abandoning "cut and try" for reasoned experiment; exchanging "it might work" for "it will work." Doing has wakened the desire for knowing, and Science has a new recruit.

This other aspect of the "game"—experiment as distinct from communication—is important. It figures largely in the terms of our transmitting licenses. We are in amateur radio *for experiment*.

Here, possibly, is where the newcomer feels most at sea, and rather humble. He thinks of the high state of development already achieved in amateur radio-communication, not to mention the work of the big commercial companies, and he may perhaps think the idea of *his* experimenting is a little futile.

Not at all. Experiment is for the purpose of finding something out *for oneself*. What if someone *has* discovered years ago, and set it all down in a book, that certain parts wired together and adjusted and fed with current will generate oscillations at radio-frequency ? It is all just a case of "so they say" until the experimenter himself has put those parts together, fed in that current, and seen with his own eyes the glow of the testing neon. Only then does he appreciate the wonder of the thing. And only when he has linked this first small set-up to an aerial, sent out his first tentative call, and heard—never to forget !—an answering call from space, does he really begin to comprehend the modern miracle of radio.

True, only one in a thousand will hit upon something really new. But the whole thousand will be broadening their knowledge of scientific fact, will be training themselves in observation and deduction, in improvisation and manual dexterity—in short, making themselves more capable citizens in a world increasingly electronic in its techniques.

And apart from all this, there is the simple but not-to-be-despised fact that they will be (if they do not neglect their wives and sweethearts overmuch !) aboundingly happy. For there is no end to amateur radio. As knowledge grows, inquiry grows. The book that seemed "too technical" yesterday becomes the familiar reference book of to-day, the puzzling theory becomes a matter of proved fact. The quest broadens into the arts of exact measurement, analysis, design and new application. The thirst for knowledge in this field, once felt, is unquenchable.

Welcome then, newcomers ! You are part of a world-wide camaraderie that will, at a mention of your call-sign, open to you their doors, their books, their knowledge and experience. Come peace, when "Calling test" goes out again from a multitude of amateur aerials, you will see !

E.H.S.

THE SYNTHESCOPE

By R. H. Hammans (G2IG)

The Synthescope will be of interest mainly to those who wish to maintain their communication receivers at peak efficiency. It may be built for use in conjunction with or without an oscilloscope.

PART I

IT is proposed in this article to describe the development, construction, and use of some versatile, yet simple, accessory apparatus. Its versatility may be judged from the following list of functions :—

For Superheterodyne Receiver Adjustments

(*a*) An automatically adjusted signal generator for R.F. *and* I.F. alignment on *all* frequencies, without coil changing.

(*b*) When used in conjunction with a cathode ray oscilloscope—as a selectivity curve tracer, including that part of the selectivity contributed by the R.F. stages of the receiver.

(*c*) When used as in (*b*) but with the addition of some standard of frequency, such as a 100 kc/s. crystal oscillator and 10 kc/s. multivibrator—as a curve tracer with calibrated frequency base.

(*d*) When used as in (*b*) with crystal filter receivers —as a means of lining-up tuned circuits " on the nose " of the crystal without the inconvenience of oscillator drift (*i.e.* reasonable drifts of the receiver oscillator or the signal generator are unimportant).

For Harmonic Analysis

(*e*) When used as in (*d*)—as a wave analyser for determining, simultaneously, the relative amplitudes of the harmonics present in audio frequency waveforms.

The last of these applications—wave analysis—is probably confined to laboratory measurement work, and will be treated at some length in the second part of this article.

Circuit Description

In its simplest form, *i.e.* for receiver alignment (see Fig. 1, Section 1) the circuit is based on the relatively unfamiliar inversion of the superhet principle. A signal is developed from a combination of the receiver's local oscillator and an external oscillator adjusted exactly to the intermediate frequency. This ensures an R.F. input suitable for connection to any receiver which is always in tune irrespective of tuning or band switching controls. In effect a signal generator, feeding the R.F. stages with a signal of correct frequency, is electrically, but not mechan-

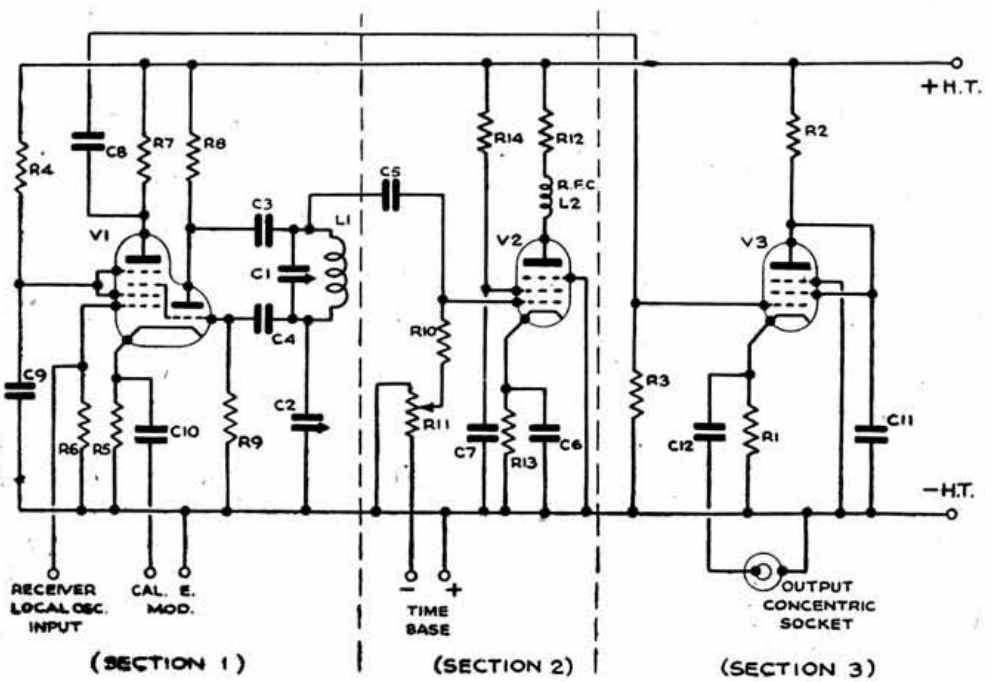


Fig. 1.
Circuit of the Synthescope.

C1	= 65 μμF trimmer.	R1	= 200Ω	R12	= 25,000Ω.
C2	= 25 μμF trimmer.	R2	= 60,000Ω.	R13	= 10,000Ω.
C3, 4	= ·002 μF.	R3, 6	= 100,000Ω.		
C5	= ·0001 μF.	R4, 9, 14	= 50,000Ω.	V1	= FC.4 or X.41, etc.
C6	= 25 μF electrolytic.	R5	= 400Ω.	V2	= TSE.4 or ACSP/3, etc.
C7	= ·25 μF.	R7	= 20,000Ω.		
C8	= ·0005 μF.	R8, 10	= 250,000Ω.	V3	= TSE.4 or ACSP/3, etc.
C9, 11, 12	= ·01 μF.	R11	= 1MΩ pot'meter.		
C10	= ·1 μF.				

ically, ganged to the receiver tuning without possibility of tracking error. Thus whatever frequency range or tuning setting is used, there is always a perfectly tuned signal arriving *via* the aerial circuit, for lining-up purposes.

The method of operation is best expressed by using conventional symbols. First consider the normal frequency-changing procedure in a superhet receiver.

Let F_s be the frequency of the desired signal.

Let F_i be the intermediate frequency.

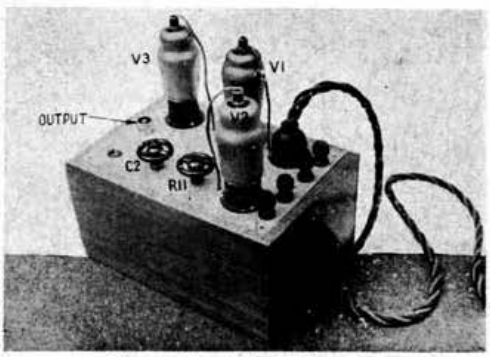
Let F_o be the local oscillator frequency.

Then $F_o - F_s = F_i$ (F_s will be smaller than F_o in the usual case where the oscillator is on the " H.F. side " of the signal).

By simple algebra, the above equation gives :—

$$F_s = F_o - F_i.$$

It is obvious, therefore, that if the two frequencies F_o and F_i are mixed, a difference term ($F_o - F_i$) will be produced which is equal to F_s (the signal frequency). F_o may be obtained from the local oscillator of the receiver by loose coupling, while F_i is generated by an oscillator tuned exactly to the I.F., but screened carefully from the I.F. stages of the receiver so that no pick-up occurs.



General View of the Synthescope.

A convenient practical unit may be constructed using a single triode-hexode or octode mixer valve, the oscillator section being used for the I.F. oscillator and the signal grid of the hexode section being " shown " some of the local oscillator output (see Fig. 1, Section 1). The signal frequency will then appear in the anode circuit, and a low impedance output, suitable for connection to the receiver aerial circuit, may be taken from the cathode. The signal so generated will always be in tune, since as the dial of the receiver is tuned, F_o will alter, causing F_s to change by an exactly similar amount. Indeed, the first impression in use is that the I.F. oscillator in the unit is radiating a steady signal straight into the I.F. stages of the receiver, but this may be proved to be false by adjusting the R.F. trimmers ; any change in " S meter " reading showing that the deflection is due to a signal arriving *via* the tuned R.F. stages as desired.

Those who have used a signal generator for lining-up R.F. stages, will at once appreciate the ease and rapidity with which tracking may be checked with this device ; no resetting of the signal generator and consequent searching on the receiver being involved.

Oscillographic Measurements

" The Synthescope " employs such a " synthetic-signal " generator as a basis on which a rather more elaborate, but certainly far more versatile apparatus is built up. The first addition takes the form of a frequency modulator, which adapts the unit for oscillographic observation and measurement ; and it is probably worth while to devote some space to a description of how the tracing of a selectivity curve on the C.R. tube is achieved.

All readers will be familiar with the behaviour of the " S " meter when a receiver is tuned through a steady carrier. Represented graphically, plotting receiver dial readings or frequency along the X axis, and S meter readings along the Y axis, the result is the familiar selectivity curve, the exact shape of which depends mainly on the characteristics of the tuned circuits in the I.F. amplifier. An identical curve would be the result of tuning an oscillator through the frequency to which the receiver is tuned, because the I.F. amplifier has no means of appreciating which is being varied—the local oscillator of the receiver or the external signal. Imagine a carrier from a signal generator being rapidly swung through the receiver's resonant frequency whilst simultaneously drawing the beam of a C.R. tube horizontally across the screen by means of some electrical interconnection. Suppose, at the same time, the beam is made to deflect vertically in response to the S meter changes ; then the spot on the tube screen will start to move horizontally during the time the carrier is remote from the resonant frequency, climbing steeply as resonance is approached, turning over at resonance, falling off and flattening to the base line again as the carrier goes right out of tune.

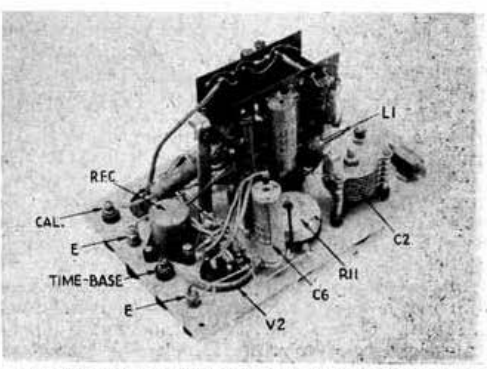
The rapid repetition of this process creates the illusion of a continuous stationary curve on the tube.

Frequency Modulation

In practice, the swinging of the carrier is controlled, sometimes mechanically, by a motor-operated condenser, but more satisfactorily by electrical means employing a voltage from the time-base saw-tooth oscillator in the C.R.O. Such an arrangement gives automatic synchronisation of the horizontal movement of the spot on the screen, and the frequency deviation of the oscillator providing the carrier.

The saw-tooth voltage is converted into a change of capacity across the oscillator tuned circuit through the medium of a valve whose gain is varied by the saw-tooth voltage as grid bias. In Fig. 1 V_2 has applied to its grid (*via* the potentiometer R11) a saw-tooth voltage supplied from the C.R.O. An R.F. voltage from the oscillator tuned circuit L_1C_1, is also applied to the grid of V_2 *via* C5 and is amplified by the valve due to the presence of the H.F. choke L_2 in its anode circuit. Owing to the " Miller Effect " the grid-cathode capacity of V_2, which is virtually across L_1C_1, will change in accordance with the gain and consequently with the saw-tooth voltage.

Providing that the correct operating conditions are ensured for V_2, a linear capacity change will result from the linear voltage change. For all practical purposes this linear capacity change may be regarded as producing a linear frequency change, since the



Underside View of Wiring and Associated Components.

variations of capacity are small compared with the total capacity across L_1. The frequency of the oscillator, and the horizontal deflection of the C.R. tube beam are both linear functions of the same saw-tooth voltage, so that the position of the spot at any instant may be said to indicate the oscillator frequency.

It is clear, therefore, that the horizontal line traced by the spot on the screen has been converted to a frequency base along which may be calibrated in uniform steps the oscillator frequency, or more usefully, the deviation of oscillator frequency from the mid-point which may represent the resonance point of the receiver.

To trace the selectivity curve, a voltage ordinate is needed in the form of a rectified signal voltage, applied to the Y plates of the tube. On most receivers this voltage is available across the signal diode load resistance. A.V.C. (if any) should be switched off in order to allow the rectified I.F. signal voltage to rise to a large enough value to give a vertical deflection on the tube of an inch or so. Overloading must be prevented by adjustment of the R.F. and I.F. gain controls; the precise deflection at which overloading occurs is easily visible in the shape of the curve peak.

Deviation of the swinging signal is controlled by the potentiometer R11 which adjusts the value of the saw tooth voltage applied to the grid of V_2. At maximum voltage a deviation of approximately $\pm$ 50 kc/s. (total swing of 100 kc/s.) is desirable in order that selectivity curves of fairly wide band I.F. amplifiers may be accommodated on the centre of the screen.

Referring again to the circuit diagram Fig. 1, it will be seen that V_2 is the frequency modulator across the tuned circuit L_1C_1. Now it is essential, in order to generate a signal of correct frequency to feed into the receiver aerial circuit, that L_1C_1 must be exactly tuned to the I.F. when not frequency modulated. When frequency modulation is applied, the deviation will be from I.F. to some lower value, since L_1C_1 is in parallel with the *increasing* input capacity of V_2. It is necessary, therefore, to include in the circuit, as part of C_1, a variable trimmer C_2 in order to reduce the average capacity under frequency modulation conditions to equal that in circuit when unmodulated. C_2 may be described as a centring trimmer, because it is used to adjust the resonance peak to the mid-point of deviation. When the curve is viewed on the oscilloscope, C_2 should allow the curve to be shifted right off the screen along the frequency base until even the extremities of the deviation band no longer extend to the I.F. C_1 is a preset air dielectric condenser. and has neither terminal earthy; C_2 is connected from one side of C_1 to earth so that its spindle may be earthed.

Calibration of Frequency Base

Thus far "The Synthescope" has progressed to the stage where it will fulfil the functions (*a*), (*b*) and (*d*) as a simple two-valve version consisting of Sections 1 and 2 (Fig. 1). Any type of communications receiver may be lined up from first R.F. stage to last I.F. stage on any frequency, and the response curve of the overall R.F./I.F. chain may be viewed on a C.R. tube. However, at this point the more curious and exacting receiver enthusiast will appreciate that, although a beautiful selectivity curve is produced, the lack of any form of calibration along the base line prohibits *measurement* of selectivity. It is of great value in *comparative* tests to be able to measure the width of the curve at half peak amplitude and find it to be (say) $\frac{1}{2}$-in. in one test and $\frac{3}{8}$-in. in another, but if *absolute* measurements are desired, kilocycles per second and not inches must be measured.

In the original design attempts were made to measure the static deviation with D.C. bias on V_2, but results were misleading, as the dynamic operating conditions of V_2 are very different. Some form of dynamic calibration had to be devised, and the problem was eventually solved by *amplitude* modulating the already *frequency* modulated oscillator, with a known audio frequency. Sidebands on each side of the carrier are thus introduced, which are swept

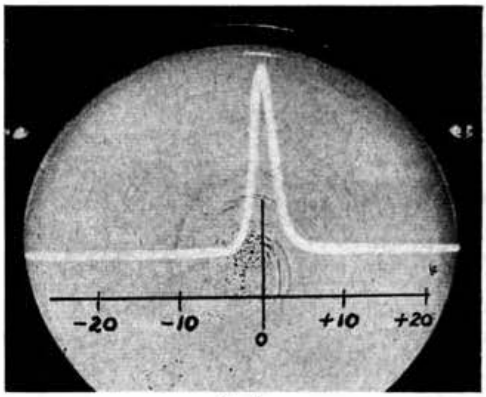


Fig. 2a.
Selectivity curve of superhet receiver. Calibrated subsequently from Fig. 2b.

through the resonant frequency of the receiver by the frequency modulation. One sideband leads the carrier, the other follows it at an exactly similar frequency interval. Each sideband behaves as a separate carrier so long as the receiver selectivity is sufficient to allow the output voltage to approach zero between sideband and carrier.

Two oscillograms are shown in Figs. 2a and 2b. The former is a typical curve of a high selectivity communications receiver whilst the latter shows the same curve with the addition of secondary responses, due to sidebands, when the oscillator is amplitude modulated by a 10 kc/s. multivibrator locked to a 100 kc/s. crystal standard. Note the presence of harmonics in the 10 kc/s. waveform, resulting in $\pm$ 20 kc/s. sidebands additional to the $\pm$ 10 kc/s. of the

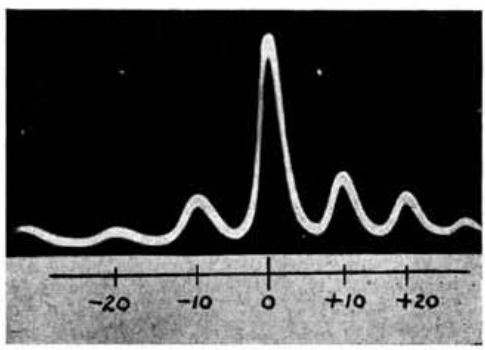


Fig. 2b.
Selectivity curve with frequency calibration at $\pm$ 10 kc/s. and $\pm$ 20 kc/s.

fundamental. Figs 2a and 2b are untouched photographs taken of the tube face, using "The Synthescope" as described, during a test on a home-built superhet. It is a very easy matter to mark off along the base line of Figs. 2a and 2b steps of 1 kc/s. or less, using the peaks of the side bands as plus and minus 10 kc/s. and 20 kc/s. markers, and the peak of the main response as the datum or mid-deviation point.

The repetition speed to which the time-base should be set, is a compromise between the lowest speed for continuity of vision (*i.e.* absence of flicker) and the highest speed allowable, considering the selectivity under measurement. For instance, suppose a receiver having very good cut-off at 5 kc/s. off tune, is supplied with a carrier swinging through tune at a repetition of 10 kc/s. The highly selective circuits will severely

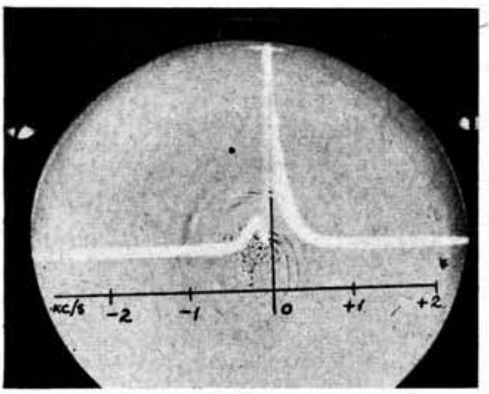


Fig. 3a.
Crystal filter curve taken with horizontal scale enlarged by 10 : 1. Note rejection trough at about + 0·1 kc/s.

attenuate the frequency modulation, the effect on the curve traced being a broadening of sharp peaks or troughs. In practice it is always best to start observation with the time-base running at the slowest possible speed and then, while carefully preserving the curve shape, increasing speed until flicker is no longer annoying. In any case the speed should be kept lower than that which causes the beginning of any modification in curve shape. Generally, the time base repetition speed may be about 100 c.p.s. for normal circuits, and no more than 20 c.p.s. for crystal filters The photographs in Figs. 2a, 2b, 3a, and 3b were taken with the time base set at 6 c.p.s. and although flicker was prominent, there

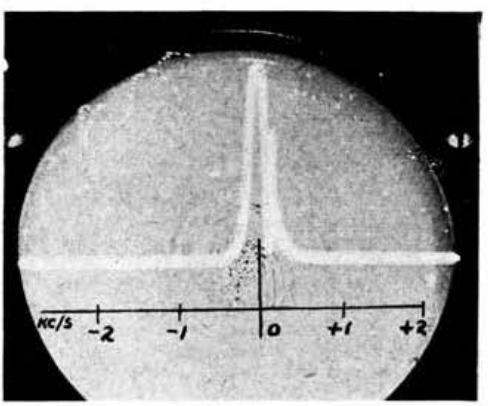


Fig. 3b.
Rejection trough adjusted to opposite side of resonance peak by means of phasing control.

was no difficulty in appreciating the detail in the curves. Even at this slow rate of frequency change Fig. 3a shows shock excitation of the crystal in a conventional filter circuit at 465 kc/s. Crystal phasing for this picture was adjusted so that infinite rejection was to the H.F. side of the peak, and the "ring" caused by shock excitation has rather confused the issue. However, Fig. 3b demonstrates clearly the infinite rejection feature of the crystal filter when phasing was adjusted to place the trough on the opposite side of the peak.

Figs. 3a and 3b were taken on the same receiver as before, the crystal having been switched in, but with the voltage from the potentiometer R11 considerably reduced so as to expand the frequency scale to the extent shown by the frequency calibration. The highly selective crystal filter would produce a very narrow response curve, too narrow for detailed examination, if the same deviation were used as for the curves in Fig. 2.

The Saw-tooth Waveform

As explained earlier, the saw-tooth voltage applied to R11 is obtained from the C.R.O. time-base. However, it is important that the voltage so obtained rises positively and drops to, or almost to, earth potential. This is essential with the frequency modulator circuit employed, since V_2 (the frequency modulator) is biased back when no saw-tooth voltage is applied, by means of the 10,000 ohms cathode resistance R13. R10 is a 250,000 ohms resistance performing a two-fold function; it serves as a limiting value to the load across the tuned circuit when the potentiometer R11 is near minimum, and as a protective measure against excessive positive time-base voltages on the grid of V_2 which might damage the valve by causing high grid current.

The method of extracting a suitable saw-tooth voltage from the C.R.O. will depend entirely on the design of the time-base circuit of the instrument. In many cases it is most conveniently taken directly from the condenser which is charged or discharged linearly, and which usually has one side earthy. Curves as shown in this article were derived from such a system, the time-base being a home constructed version of the Puckle circuit.

Output Stage

The third and last section of Fig. 1 is a cathode follower stage, which besides providing some separation between V_1 and the output, transforms the high impedance at the anode of V_1 down to a value of the order of 100 ohms. to match low impedance receiver inputs. In addition, the inter-valve coupling provides scope for the introduction of filter circuits for wave analysis to be described later.

Constructional Details

Layout is relatively unimportant. There is no part of the circuit liable to self-oscillation of an unwanted nature, consequently no interstage screening is required. The whole instrument should be enclosed in an earthed metal box to avoid direct radiation from the I.F. oscillator into the I.F. stages of the receiver. However, if the receiver is well screened even this may be dispensed with.

In Fig. 1 a terminal marked "Receiver local oscillator input" will be seen connected to the grid of the hexode. A suitable coupling to the receiver may consist of a flexible wire from the top cap of the hexode to the oscillator tuning condenser of the set under test. No direct connection at this end is needed. The end of the wire suspended near a "hot" point will suffice.

L_1C_1, the tuned circuit between grid and anode of the triode section of V_1, is in the case of the original unit an iron cored inductance tuned by about 30 $\mu\mu$F. A coil and trimmer taken from an I.F. transformer would probably provide an excellent ready-made L.C. circuit, but it should be remembered that a fairly high L.C. ratio is needed in order to allow the small changes of capacity from the frequency

(*Continued on page* 96)

THE POST-WAR AMATEUR STATION*

An Architect's Point of View

By R. Parsons, A.R.I.B.A. (G6RP)

So much discussion goes on to-day about post-war development and reconstruction that it is hoped the following notes will be of assistance to amateurs who are planning to reorganise their station.

Every well designed station falls naturally into three sections: (1) The operating position, (2) the constructional section, and (3) the "at-ease" position.

The Operating Position

For a simple station, upon which elaborations are planned at a later date, the operating position, should accommodate normally the receivers, monitor, frequency meter, microphone, key, switches, and log book.

The usual arrangement is a bench or table—preferably made specially for the job, and of a height convenient for comfortable sitting (2 ft. 7 in. is usual). The bench should embody every useful aid to operating. The receivers, monitor and frequency meter should be so placed as to be comfortable to use. The table must be long and wide enough to take a normal size pad and call book with enough space to manœuvre them about when in use.

When constructing the table, it is an advantage, if space permits, to make it slightly larger than strictly necessary. The position of the key is important; this should be located on a shelf—fixed or extending—if the operator finds the desk top too high for comfort. Sufficient space should also be left for stretching the legs. In practice, this has resulted in building the frame of an average size desk, with kneehole in centre, shelves below the top on left and right for apparatus, and drawers for housing the log and call books, blank QSL's, etc., leaving the top for receiving and writing. Flexibility can be obtained from quite a small amount of apparatus, by the judicious use of switches and relays, whilst headphones and meters can be fitted with plugs. Those who favour the use of short leads may not fully approve of switches and plugs but much time is saved, and the resultant appearance is more than justified. A reliable clock and special QSL cards will no doubt find a place above the receiver.

The Constructional Position

A work bench having good light, and with a strong flat top is essential. Here again attention must be paid to height (generally 3ft. 1 in.)—this time for standing. The bench may be fitted with a gas point for soldering (and making tea !), switch plug for an electric soldering iron, and power points for testing. Shelves under and above the bench will provide space for odd components and tools. If a good system of storage is adopted, time is saved, and parts can be found quickly. That portion of the station used for construction should, if possible, be kept separate—by a space at least—from that used for operating. The ideal arrangement is to have the workshop apart altogether from the operating position.

Let there be a dividing line, both physically and mentally, between the job still under construction and the one ready for use. A visiting amateur is always impressed by a neat station, but he does not expect to find the construction bench always tidy or empty.

The "At-Ease" Position

As this position should satisfy the need for space for social purposes including accommodation for visitors, the allowance should be as generous as circumstances permit. Heating must be sufficient to provide warmth on cold nights when DX is not too good.

Having considered the general details, the station owner must now decide where he is to lay out his "shack" (can we not have a new word that conveys a meaning of neatness and efficiency rather than something dilapitated, dirty and untidy ?). Two solutions are obvious—except for those fortunate enough to build their house around their station—(1) the provision of a special building, or (2) the adaptation of an existing room or building.

Using the Roof Space

Dealing first with adaptation, which requires greater ingenuity, the need is for a room large enough, and with good natural lighting. If a new station is planned, extensive use can be made of the roof space in a house. There is generally ample floor space, but floor joists may be weak. This drawback can be overcome by putting in extra joists, or by strengthening the existing ones, and covering the room area with floor boarding. By fastening upright wood members between floor joists and rafters, and by covering with fibre board, walls are formed—say 4 ft. high. By continuing the lining up the rafter slope to a height of 8–9 ft. from the floor, the room is completed, with light ceiling joists between the rafters at that height (Fig. 1). Incidentally the additional timber will greatly strengthen the structure.

Dormer windows can be made by cutting away portions of rafters and making the necessary opening, fixing windows with sides, and roof over, either flat or pitched to suit the main roof. Access can be gained by means of collapsible stairs, which slide into the roof space when not in use, and pull down easily when required.

The attic is generally quiet from domestic noises, but noises made there are very liable to be heard below. To overcome this trouble sound proofing may have to be introduced. This is achieved by keeping the extra joists apart from the old ones, and by raising up the new flooring a fraction of an inch. If the existing timber is sufficient, a layer of felt can be laid lightly over the joists, and the new floor boards put down on top. Partitions are treated by the use of thick, soft fibre boards, and by separate fixing where possible to solid anchorage. (These suggestions are general, and will have to be modified to suit local conditions.) Benches will give less trouble if mounted on a piece of felt placed under the legs, in fact any material which can be used to insulate the original structure of the house from the new work will help to keep down noise conduction.

The Garage Site

Where the garage is a single storey building at the side of the house this might prove a perfect location. A slate or tile roof could be raised sufficiently to

* *Some notes contributed by the author to the discussion "Planning the Post-War Amateur Station," at a Meeting of the Society, held at the I.E.E., London, on May 1, 1943.*

accommodate the station beneath it, or a flat roof made with new joists and flooring over the actual garage (Fig. 2). If the garage possesses one wall common with the house it may be possible to cut a doorway from house to station direct. If not, a staircase from the ground can be built outside. A garage site has the great advantage of causing very little interference with the house, and little risk of sound transference.

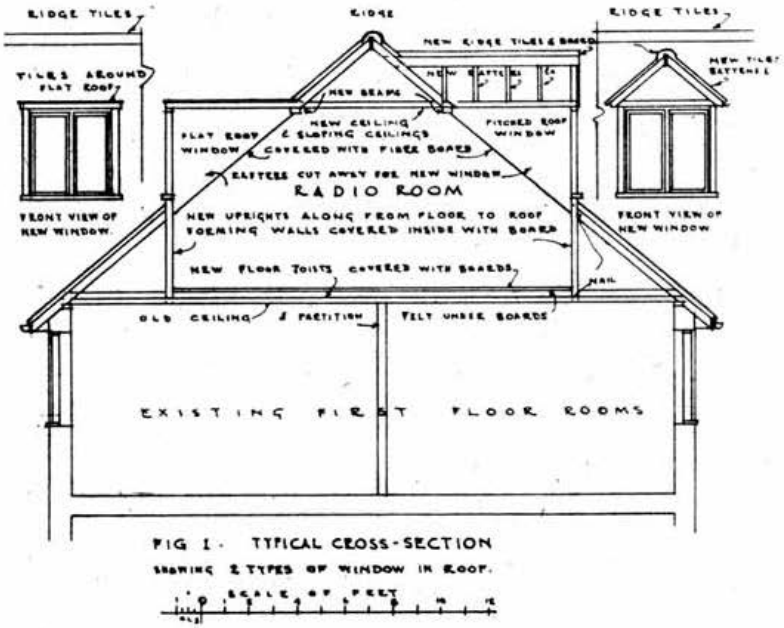


FIG 1. TYPICAL CROSS-SECTION
SHOWING 2 TYPES OF WINDOW IN ROOF.

Other Sites

The two sites suggested above relate to modern houses but for the older terrace type of housing, the basement is usually the best place for the station. Noise is at a minimum, floors are adequate, and space is generally ample. Although the lighting may be poor, it can be improved by cleaning, or other simple remedies. Heating and electrical installations are easy, and access is already provided.

Where an ordinary room is to be used, little alteration is possible, consequently the best use must be made of that which is already there—the success of the arrangement depending entirely upon the layout.

After the war many useful size huts will be offered for sale. These will be capable of easy assembly, but

(*Continued on page* 96)

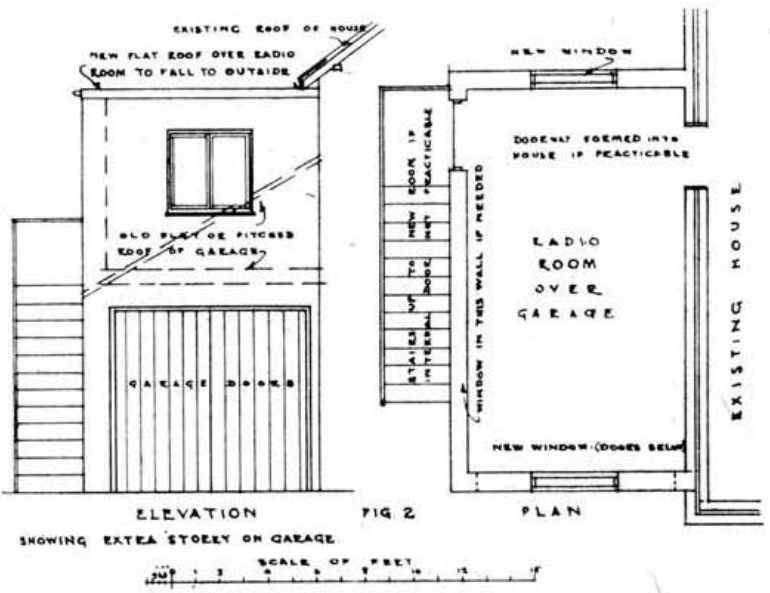


FIG 2

APPLIED D. C.

By F. J. Forbes (2BFC)

PART III

Conversion of Receivers

TWO conversions from A.C. to D.C. have been undertaken by the writer for his own use ; the first was a *Brunswick* model BTA /3 eleven-valve receiver covering from 6·5 to 2,000 metres, the second a *National* HRO Senior.

In the case of the Brunswick receiver four valves were replaced because they were of odd heater ratings ; the types were 5Z4g (rectifier), 6F6g (operating as tuning indicator) and two 6N6g's (push-pull output). The remaining seven which were in the 6·3v 0·3A class, were placed in series with a ballast resistor. A " magic eye " (6E5) was used to replace the 6F6g and this was connected in series with the other 6·3v valves. Mazda Pen3520's were used as substitutes for the 6N6g's whilst two Mazda U4020's were wired in parallel in place of the single 5Z4g. These two rectifiers give 230 volts at 150 mA. The new pentodes and rectifiers were operated, in conjunction with a barretter, in a series circuit of their own, as shown in Fig. 10. This arrangement was used because the Mazda valves draw a heater current of 0·2 Amps. and the components, as well as valves, were all on hand.

was built, and except for replacing the 42-type output valve by a type 43 and modifying bias **and screen** resistors, the receiver is not altered in any way. The heater circuit was, of course, wired in series. As can be seen from Fig. 11, the scheme employed is the same as outlined earlier. The values quoted apply to the converted receiver. When headphones are connected to the 'phones jack no hum is audible ; but some hum is audible when they are inserted in the output circuit. When a loud speaker is used the back-ground noise drowns the little hum that exist.

General Conversions

Before commencing any A.C. receiver conversion, it is advisable always to enquire whether there is an A.C. /D.C. counterpart and if so try to obtain a copy of the circuit diagram. If this is unobtainable, the main part of the conversion should be carried out on the lines suggested. When the set is working on D.C., experiments can be conducted with resistors, etc., in order to obtain optimum performance. This procedure is adopted by the author in commercial work.

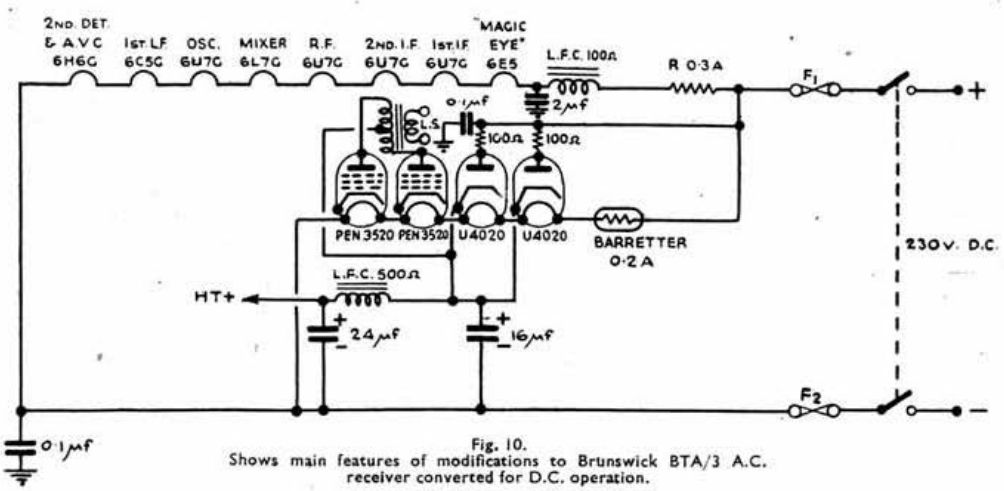


Fig. 10.
Shows main features of modifications to Brunswick BTA/3 A.C. receiver converted for D.C. operation.

As smoothing was not found to be essential in the anode circuit of the Pen.3520's these are run direct from the rectifier, and this in turn saves considerable voltage drop. Smoothing for the rest of the receiver is necessary and the original smoothing choke (the speaker field), which had a value of some 2,500 ohms, was replaced by an L.F. choke of unknown make, its resistance (500 ohms) alone being known. The output circuit bias resistors, smoothing condensers, and several high value H.T. dropping resistors were changed for more suitable values, otherwise the circuit remained the same as the A.C. version.

This receiver has now been in operation for several years, its performance being extremely good on all bands including the pre-war television sound channel. It provides slightly less volume than the A.C. model although this is more than sufficient to fill a room measuring 12 ft. × 9 ft.

For the HRO conversion a separate power pack

Suitable Loud Speakers

For A.C. /D.C. receivers the simplest form of loud speaker is, of course, the permanent magnet type ; although an energised type can be used. If the resistance of the field coil is between 5,000 and 6,000 ohms it can be connected directly to the mains supply. Speakers employing field coils of a value lower than 5,000 ohms tend to overheat badly, but they can be used, provided a resistor is connected in series with the field to bring the total resistance up to about 6,000 ohms. The speaker used with the writer's converted HRO has an energised field of 2,250 ohms, with a 2,500 ohm resistor connected in series, and run directly from the D.C. mains (Fig. 12c). The 60 mA. fuse bulb acts as " H.T. on " indicator as well as a fuse whilst the 1μF condenser reduces to zero the slight hum that is present when it is not fitted. For safety all output circuits should be choke filter type as shown in Fig. 12**d**.

General Uses of D.C.

With some apparatus, such as code practice oscillators, exact heater volts are not essential. One such set built by the writer used a Cossor 13 SPA as the oscillator, and a Mullard UR1c for H.T. supply. As these valves are in the 0·2 Amp class, a 40-watt electric light bulb was used as a ballast resistor. Although this gave less than 0·2 Amp the set worked very well.

A cheap and useful " flash test " can be constructed for D.C. operation by using an ordinary lamp in series with a pair of test prods (Fig. 13). If a small neon (as used for cooker indicators) is plugged in, then a leakage test on condensers can be carried out. If a leakage is suspected between say, a winding and the frame, then if the lamp is replaced by a 5 Amp electric fire any leak or low resistance will be shown up by an arc or flash over. It is important to remember that when carrying out the above tests the job should not be connected to earth.

Charging Circuits

This subject has been dealt with by other writers in full, but one or two simple dodges may interest those who do not charge on a large scale. A simple charging board can be made up with electric light bulbs (Fig. 14), one or more lamps being used in parallel according to the current required. Bulbs in the 5 to 100 watt group are the easiest to obtain, which on 230 volt mains give from 18mA. to 0·43A approximately. If larger currents are required an

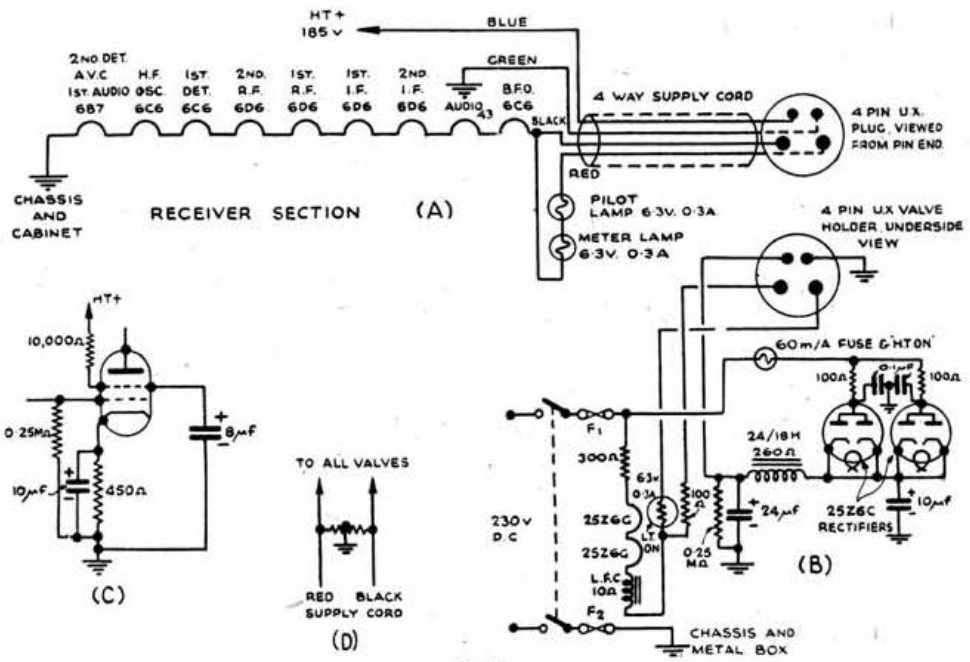


Fig. 11.

(a) Receiver section of National HRO converted for D.C. operation. Heaters and pilot lights are in series and the original supply cord is used for H.T. and heater supplies; the spare wire is taken back to the shunt for the two pilot lamps. (b) Circuit of the power pack used in D.C. version of HRO. The " H.T./L.T. on " lamps, together with the " on/off " switch, are mounted on the panel. The 0·25 megohm resistor across the 24μF final smoothing condenser will discharge both the smoothing and reservoir condensers when the H.T. is off and the mains plug pulled out. (c) Modified circuit of the type 43 valve which replaces the 42 output valve. The screen resistor and decoupling condenser were not in the original design, the grid leak and cathode resistor were changed from 0·5 megohm and 500 ohms respectively. (d) The original 60 ohm " humdinger " is removed, and the power supply leads are connected as shown in Fig. 11A.

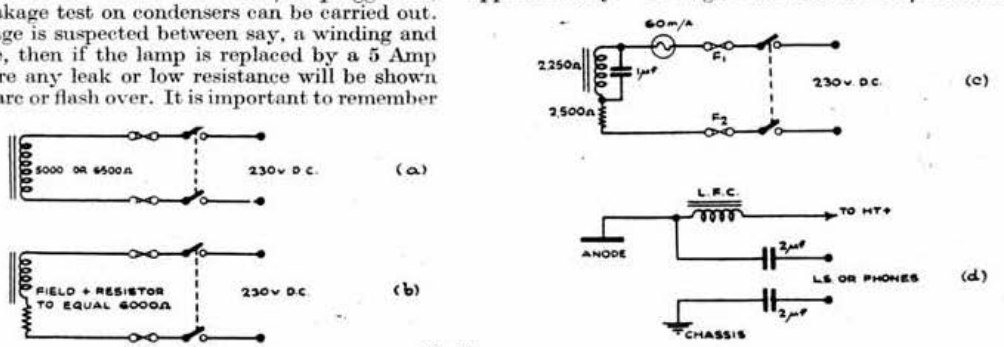


Fig. 12.

(a) Loud speaker field coil of 5,000 to 6,500 ohms can be connected directly across 230 volt mains supply. (b) Shows circuit similar to Fig. 12A, but field coil is less than 5,000 ohms. It is made up to 6,000 ohms by placing a resistor in series. (c) Shows the speaker field arrangement used in conjunction with the converted National HRO receiver. (d) Choke filter output for use with D.C. receivers; the two 2μF condensers isolate the output from the receiver, thus making the operator safe when using 'phones.

electric fire can be used in place of the lamps. Carbon filament lamps are generally used, but the author who has strong Scottish blood in his veins, finds that the ordinary lamps (or the fire) light or heat the shack,

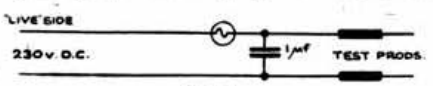


Fig. 13.

A "flash test" arrangement. The lamp may be replaced with a small neon: for condenser tests the 1 μF gives some smoothing to the output when used with a neon.

thus doing two good jobs in one ! It is important to remember that the wiring, etc., must be of the highest standard both for safety and fire hazard ; the latter is a very real one so far as accumulator charging is concerned. Should the mains fail—or the shilling run out—then the cells will discharge back through the house appliances, or through the whole town if the former fault develops, therefore a charger should never be left running without supervision.

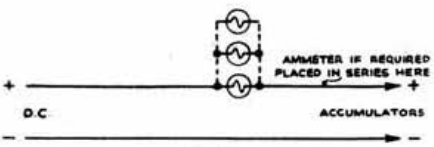


Fig. 14.

Illustrates a simple charging circuit; one or more lamps can be used in parallel.

Conclusion

Although only a few uses for D.C. have been mentioned, readers will find that after a little experience has been gained quite a friendly feeling will prevail for what may appear to be an unwanted child.

Safety precautions have been stressed simply because with D.C. circuits there are many live points with respect to earth. If the bogey of D.C. has been chased away, be it only for a few, then this work will have been well worth while.

The author wishes to record his thanks to Dr. W. H. Marshall for his advice and criticism when writing this series of articles.

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Khaki and Blue

● From Ceylon comes news of Sgt. C. R. MacGregor, **BRS1521** and Sgt. W. Richardson, **G8VX** (not 'VK as recently quoted). 4521 wishes to be remembered to G8CY and W. O. Johnstone, VS1AP, whom he met in hospital before leaving England. G8VX sends greetings to G5IV, OW, 6PY, KG and 2FQF.

● Airgraphs are to hand from Cpl. J. D. Baker, **BRS3766** (Military Establishment, No. 8 M.E.F.), Capt. D. E. Herbert, **G RF** (No. 12 A.A.S.C., M.E.F.), A.C.1 N. Woodnutt, **BRS3594** (113 M.U.), Sig. R. W. Lay, **BRS42 8** and Cpl. J. D. Lambert (107 M.U.). Cpl. Baker wishes to be remembered to Messrs. Firmin, Appleby, Hoare, Sadler, Nicholson, Blackwell and Buck. Capt. Herbert is training many "S.P.'s" (whatever they may be) and has made several contacts. Woodnutt sends 73 to G2FC, XC, 3HT, 6AQ, 2BDP, DVQ, 1330, 4139 and 5943, G3QV, 5ZA, 6FK and GW3QB are associated with him in a local radio club. Lay, who is with a Signals Battalion of the U.S. Army, is endeavouring to whip up enthusiasm in his unit. So far he has located six amateurs. Lambert reported that another United Nations Conventionette was being planned for December 7 in Cairo. If the event has taken place we hope to publish a report in our next issue. He sends 73 to all in District 13.

● Capt. Jim Kirk, **G6ZO,** in a letter from A.F.H.Q. Signals Coy, B.N.A.F., reports that a Hamfest was held on September 28 "right in among the transmitting station where several of us work. The setting, undoubtedly appropriate, was made more so by the energies of two of the lads who previously had prepared a mammoth breadboard rig ending up with an enormous push-pull parallel 450 TH's, final to show what was meant by the expression 'California Kilowatt'! The early stages were shown as installed in the basement and a loss-less link coupling cable carried the 'soup' upstairs to the four big babies in the attic. An artistic member drew a first-class enlargement of a Gremlin riding his kilocycle, as portrayed in a recent issue of QST, with the addition of a sketch showing a group of Service men doing their level best to run him to earth." The party included the following: G3CK, 6ZO, GM3SF, 2AMG, BERS187, BRS5202, W2JYM, W4EKA, W5IUW, W6SCW, VB, AXT, W7HPQ, 1QP, W8NOM, Q1B, QUO, MTE, S1F, W9QAX, PLD, CD, CN8AV, and K6SRZ The Royal Navy, Royal Signals, the American Navy the U.S. Signal Corps and the French Army were represented, but unfortunately the group photograph sent by G6ZO was too poor for reproduction.

● P.O. Jack Brazzill, **G3WP,** in a letter from TF, reports that G2NT and 2BUV have departed for other climes leaving him as the sole R.S.G.B. representative in that island. He has made contact with W2MNH and continues to meet W2HJA daily. Friends of G3WP will note his promotion to P.O. rank.

News from the Kreigies

From Walter Caughey, **2DZG,** comes news that the attache case sent to him by the Society, *via* next of kin, has arrived safely as have parcels containing books, games and tobacco. He extends grateful thanks to *all* who have contributed to the R.S.G.B. P.O.W. Fund.

Radio Officer Webb, **G6WQ,** also acknowledges safe receipt of the attache case and kit bag sent to him through next of kin. In a letter to G8TL, he mentions having inaugurated a Radio Society in his camp. The members already 20 in number, intend to keep together after the war.

Lt. D. L. Blair, **G8VU,** is now at Oflag VA, Germany, having been transferred from an Italian camp.

Hospitality Offered

Mr. G. S. Light, ex **VI 3ABW,** and one-time Route Manager, A.R.R.L. Trunk Line 1, will be glad to meet U.S. and Canadian amateurs at his home 94 Downlands Road, Purley, Surrey. Telephone Horley 970 during the day.

Congrats

● To F./Lt. and Mrs. Paul Carment, **G5WW,** on the safe arrival of a junior op—John Maxwell. His birthday is November 16.

● To L.A.C. and Mrs. C. W. Finch, **BRS5834,** on the birth of a son on October 27.

A Ramp

The following advertisement appeared recently in a National newspaper :—

"Hallicrafter 8 valve A.C. Sky Champion communication set, 4 wave, perfect, *best offer over* £35."

The italics are ours !

We hope that no member was persuaded to part up with £35 or more for a receiver which originally sold in this country for £15.

Are You Interested?

Vacancies exist in the Admiralty W./T. organisation for Maintenance and Service Engineers who have had sound practical experience. Responsible positions are open to men with the necessary qualifications. Service may be at home or abroad. Letters should be addressed, in the first instance, c/o General Secretary, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1, marked "W./T." in the top left hand corner.

★ **IS YOUR SUBSCRIPTION DUE ?**
PROMPT PAYMENT ASSISTS HEADQUARTERS

Letters to The Editor

A Foreign Languages Vocabulary for Radio Amateurs

DEAR SIR,—Whilst I realise that space in the BULLETIN is very much restricted I have a suggestion to make which if carried out now would prove of great value to amateurs in post-war days. As there are a large number of foreign amateurs at present in this country would it be possible to prepare, with their aid, a fairly comprehensive list of expressions frequently used in phone transmissions in (say) French, German, Spanish, etc., with their English translations? It would also help if some idea could be given of the way the words are pronounced also the pronunciation of the letters of the alphabet and numbers up to 10. This information would be most useful when working foreign stations with only a slight knowledge of English.

If present space does not permit the publication of the information now, could such a list be prepared while the foreign amateurs are on the spot with a view to post-war publication? If this course were adopted perhaps other matters might be incorporated (for example, the "Q" code adapted for amateur use:—QDO and QTG might be altered to allow a station to obtain an "s" reading on his meter, etc.).

The desirability of including 'phone phrases in Esperanto, Basic English, etc., is also worth considering.

I should be interested to read the views of members on this matter.

Yours faithfully,
CHAS. BRYANT (G3SB).

Editorial Comment.—We should welcome the co-operation of members who are in a position to carry out the first part of Mr. Bryant's suggestion. An offer from a qualified member to collect and tabulate the information would also be appreciated.

R.F. Fields or Supersonic Vibrations?

DEAR SIR,—Mr. I. B. Clark, 2BIB, writing in the June BULLETIN, described some interesting effects which he attributes to the influence of radio frequency fields. Are these effects, however, in reality caused by the radio frequency field, or is your correspondent perhaps confusing the effects of radio frequency fields and supersonic vibration?

One method of producing supersonic vibration is to apply radio frequency energy derived from an oscillator to the electrodes of a substantial quartz crystal immersed in oil; the crystal is set into mechanical vibration at high frequency and the substance under test is placed in the oil bath. At a frequency of the order of 500 kc/s. effects identical with those described by your correspondent have been observed by various workers, see, for example, Porter, *Industrial and Engineering Chemistry, Analytical Edition*, 1940, *12*, 748.

I am keenly interested in the possible effect of a radio frequency field itself in promoting chemical or physical change, and I should be most grateful to Mr. Clark if he could provide any relevant information. The only published work of which I am aware is a polymerising effect of a silent discharge at 500 cycles on rubber and a non-thermal vulcanisation of rubber promoted by radio frequency at 50 Mc/s.

I would suggest that a very probable explanation of cooking eggs in the tank coil of a transmitter is generation of heat within the egg due to its high dielectric loss factor, and it is important to eliminate purely thermal effects in studying the effect of a radio frequency field *per se*. The purely thermal effect is a well known principle which is providing a valuable tool in the hands of the chemical engineer, and is finding increasing application in the plastics and rubber industries under the name of "Heatronic Moulding," the mass to be heated being placed in a powerful radio frequency field between suitable electrodes. This method of heating is particularly advantageous, in that heat is generated uniformly throughout the mass of material, in contrast to the usual method of applying hot plates to the exterior which inevitably gives rise to a steep temperature gradient within the mass.

Yours faithfully,
G. F. BLOOMFIELD.

Diversity Reception

SIR,—With reference to Mr. H. V. Griffiths' article on Diversity Reception in the October BULLETIN, it is noted that he states receivers of modern design will have a meter for setting up the correct oscillator feed voltage to the mixer valve.

Recently, when working on the design of a communications receiver, I was struck by the fact that the value of oscillator volts shown in manufacturer's data for optimum conversion was a fixed figure and probably derived from measurements at audio frequency or at a single radio frequency of low value.

In an attempt to settle this matter a letter was written to Messrs. Edison Swan Electric Company, asking how the operating frequency affected this value. Their reply stated that providing these voltages were slightly in excess of that recommended one could rest assured of obtaining maximum conversion efficiency.

As I shall be unable to verify this statement for some considerable time I shall be pleased to have the opinion of others as these two statements do not seem to tally. To my mind it is unlikely that the same conditions will hold at, say, 1 and 30 Mc/s.

Yours faithfully,
M. PITTAM, (BRS2977).

DEAR SIR,—Replying to Mr. Pittam's letter, I feel that the optimum conversion voltage should theoretically be a fixed figure, which would be more or less independent of frequency in the theoretical case.

From valve data, a figure of 10 volts is generally assumed to be correct, and in these circumstances the conversion should be linear in amplitude; *e.g.*, an increase of 6 db R.F. input signal to the mixture should produce an increase of 6db in output at the low frequency.

In actual practice it is found that a conversion voltage of 11 volts seems to be necessary, but this may be due to a small error in the measurement of the oscillator voltage.

The point of metering the conversion voltage is concerned with the fact that oscillators of normal design vary considerably in their output power, with variations in L. to C. ratio, as the tuning condenser is tuned from maximum to minimum setting on any particular range. Thus, unless precautions are taken, at the maximum capacity end of the range it is likely that the conversion voltage will fall below the optimum figure, although it may be quite sufficient at settings midway or toward the minimum end of the tuning capacity. Hence our own practice of indicating this voltage, and providing an adjustment to compensate for variations in power of the local oscillator.

Yours sincerely,
H. V. GRIFFITHS.

Amateurs and the British Manufacturer

DEAR SIR,—The views expressed in the recent Editoria entitled "Amateur Enterprise and Status" (R.S.G.B. BULLETIN, September, 1943) are no doubt in accordance with the hopes of all British amateurs, but some indication of what the amateur will expect from the British manufacturer may not be out of place.

A considerable number of British firms have seemed to be of the opinion for many years that the amateur is of little importance and consequently has no need of specialised equipment and have accordingly produced very mediocre goods, which quite naturally have been ignored by amateurs generally. This reason largely accounts for the lack of support, about which our manufacturers have complained on so many occasions.

It is therefore very desirable to state quite definitely that unless a different view is taken in the future, it is certain that no measure of success will be achieved. In this connection it is felt that the Society might do useful work in bringing to the notice of manufacturers the type of equipment which is mainly required and although the uncertainty regarding the frequencies which will be available for amateurs after the war must have an adverse effect on future planning, this should not be used as an excuse for "sitting on the fence," as there is a large number of items for which plans could be made with reasonable safety.

The use of the expression "cheap foreign-made apparatus" in the Editorial is regretted. The bulk of the equipment used by amateurs here has always been of American origin and although there has inevitably been keen arguments as to the respective merits of the products of the various makers, the general opinion has always been that the equipment supplied represented good value for money.

It ought, therefore, to be made abundantly clear that all manufacturers wishing to cater for the amateur are merely wasting their time and money unless they can produce at competitive prices equipment which in technical efficiency equals or exceeds that obtainable from America, as the products will be judged solely on technical merit and price. All things being equal, it is quite safe to say that an amateur would buy goods made in this country, but it will be of no use relying on a "Buy British" slogan if foreign goods of equivalent technical efficiency are procurable at a very much cheaper price. Amateurs generally are not wealthy and these little savings mean the difference between another piece of equipment or going without.

It is recognised that in the past the manufacturer has been greatly handicapped by the relatively small number of British amateurs, but in view of the rapid expansion of the Society's membership during the past two years, this position should no longer exist, and as there are quite a number of firms in this country who are more than capable of producing amateur equipment of good quality and technical efficiency, it is hoped that they will see the advantages of being ready for the large demand which will be in evidence after the war.

There is one further point which ought to be mentioned and that is that no unfair trading must be allowed. As an example of this point, may I recall to older members the introduction of the British equivalent of the American T20 valve at a price a few shillings greater than that at which the T20 was then selling, whereupon the distributors of the American valve, presumably under the impression that they were being patriotic, increased the price to that of the British valve. This or any other similar method of allowing British goods to compete with foreign equipment is wrong in principle and must be discouraged by amateurs generally.

In conclusion, it may be said that the sole object of the foregoing remarks has been to provoke on the part of amateurs and manufacturers alike further thoughts on the subject of future relations and the writer will be perfectly satisfied, if as a result of this, some form of co-operation between the Society and the manufacturers should be agreed upon.

Yours faithfully,
W. E. BECK (2ALG).

BRITISH ISLES NOTES AND NEWS

DISTRICT 1 (North Western)

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

Bolton.—Congrats are offered to 2ABT on qualifying for the Fathers' Section of the Bolton Radio Society on November 22, with a YL Junior Op. The T.R. recently received an interesting letter from G4AW (Bolton's representative at Malta), in which he describes being present, in an official capacity, at the surrender of one of the Italian battleships. He says he would gladly have swopped it for a rowing boat on one of our local lakes!

Local members extend heartiest Christmas greetings and best wishes for 1944 to all members, remembering especially those whom we have contacted personally during the past four years. As no arrangements have yet been made for the January meeting, those interested are asked to contact 2DVQ. *via* 2DVQ.

Bury.—Mr. L. A. Lees (BRS4891), of 120 Tollington Road, Elton Bury, in response to the D.R.'s request, states that he will be pleased to welcome Service members any evening except Saturday and Sunday. He complains of lack of activity in Bury and says he would like to hear from other members living within 15 miles of the town. So far he is the only member who has taken the trouble to send his address to the D.R.

Liverpool.—The acting T.R. (Mr. R. W. Wright), sends best wishes to all local members for Christmas and the New Year. He will be pleased to receive reports for publication in THE BULLETIN.

* *

The D.R. is pleased to record a recent meeting with Jim Davies (G2OA), who is now a Pilot Officer and posted to the Liverpool area. Plans for an early resumption of meetings (preferably on a Saturday afternoon) are well in hand and it is hoped that a settled programme will be formulated for the New Year.

May all members at home and overseas have an enjoyable Christmas and may our wishful thinking for 1944 become a reality—bringing peace with victory and a speedy re-union of our scattered membership. 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.

Mr. L. Blagborough, 2DUX, 39 Fountain Street, Sowerby Bridge, has been appointed T.R. for Sowerby Bridge and Halifax. Will members in these areas please contact him with a view to arranging meetings?

G6KU after having made a little more progress with his superhet, wishes to exchange ideas with any member who has built a double crystal job. 2DUX is now radio instructor to No. 1171 Squadron (Sowerby Bridge) A.T.C. 8JD (Chief Radio Officer, M.N.) has recently arrived back in G. after four years in the Middle East. He wishes to contact any Bradford area member who is a M.N. Radio Officer. Where is 6AZ? 5GJ is now a Warrant Officer, R.A.F. 4MC is in GI after an extended tour of North Africa. 3HA (R.A.F., B.N.A.F.) has built a miniature two-valve receiver to enable him to listen to news from home. As the valves are from a German aircraft and the 'phones are Italian it appears to be an "All Nations Receiver"! He would like to hear from 3KF and 2DM. 5893 is building a power pack, to be followed by a three-valve receiver. Can anyone give him information on the Jones Super Gainer two-valve receiver? (Address: 8 Fountain Street, Morley, Leeds.) 2BMC has obtained some

A Christmas Message from our President

AT the end of this month I vacate the Presidential Chair—my term of office ended. During these long years of war, the most critical in the history of the world, I have been privileged to see many of the ways in which the British Radio Amateur is assisting the war effort.

In the various technical branches of the Royal Navy, the Army and the Royal Air Force I have met many pre-war amateurs whose call-signs are known in amateur circles all over the world. Many of them have departed to foreign fields and several, alas, have made the supreme sacrifice for King and Country.

From what I have seen, both in the Services and among the "Back-room Boys," may I say, quite humbly, how proud I am to have been your President during this period.

Twice have I seen the many attractions and interests which a course at an R.A.F. radio school can offer. On coming away from such visits I have felt a deep sense of longing to return and to be amongst those who are preparing and training men for winning this war.

The struggle against our enemies is now rapidly approaching the climax for a final blow by the United Nations. If we all strive our utmost during the next few months we can look forward to 1944 being a decisive and victorious year.

To all Radio Amateurs, whether at home or overseas, I wish a Happy Christmas and a safe and early return from the war.

A. D. GAY (G6NF).

Alfred Duncan Gay, G6NF, President.

good results with his O-v-l. 2LT sends seasons greetings to all Sheffield area members and would be pleased to hear from any of them, particularly 3VY and 3RU. The D.R. and Scribe also send seasonable greetings to all District 2 members wherever they may be. G8UO.

DISTRICT 3 (West Midlands)

D.R.: V. Desmond (G5VM), "The Chestnuts," Hanley Castle, Worcester. Scribe: E. J. Wilson (2FDR), 48 Westbourne Road, Olton, Birmingham.

Birmingham.—We were pleased to receive a visit from Mr. H. M. Hart, who was treasurer of M.A.R.S. until a few months ago. He is now working in the north-west. News has also come to hand from Tom Martin, G2LB, who is in the north-east. He hopes to visit Birmingham in the near future. The D.R. has received a letter from Sgt. K. R. Best (R. Sigs. India). He has met one or two VO's as well as a number of G's in "exile." 2FDR.

DISTRICT 4 (East Midlands)

Deputy D.R.: Albert E. Clipstone (8DZ), 14 Epperstone Road, West Bridgford, Nottingham.

Derby.—T.R. reports visits from 8SI and 2CVV, but there still seems to be no interest in local meetings. 4600 is fit and well in B.N.A.

Leicester.—The six members who attended the November meeting spent a pleasant time discussing general radio topics. Will the many new local members who have not yet visited the T.R. please do so as soon as possible? His address is 292 Gwendolen Road.

Forthcoming Events

Dec. 17	District 12, informal meeting, 7.30 p.m. at The Cock, Cockfosters.
Dec. 18	Annual General Meeting, 2 p.m. at Institution of Electrical Engineers, W.C.2. See separate announcement.
Dec. 19	District 6 (Torquay section), 3 p.m., at G5SY, "Sherrington," Cleveland Road, Torquay.
Dec. 26	Scotland "A" District, 3 p.m., in the Royal Technical College, George Street, Glasgow. Enter by Montrose Street.
Jan. 2	Districts 7 and 13. Combined meeting, 3 p.m., at the Y.M.C.A., North End, West Croydon.
Jan. 2	District 4 (Leicester section), 2.30 p.m., at G3BU, 15 Abbeymead Road, Abbey Lane, Leicester.
Jan. 9	Scotland "C" District, 2.30 p.m., at 7 Airlie Place, Dundee. (For subject see local press.)
Jan. 23	District 5, 3 p.m., at 17 Colston Avenue, Central Bristol.

Mansfield and Sutton.—BRS7171 is still waiting to hear from members who would like to attend local meetings. He hopes to see this area well represented at the Social in Nottingham on December 18.

Nottingham.—There was an attendance of eight at the meeting held at 2AOO, when our host demonstrated his new amplifier and oscilloscope. Both items evoked much interest. After the meeting 8DZ went to bed with 'flu and stayed there for a week. We are sorry to hear that 8JV received an accident to his leg whilst returning to duty; he tripped in the dark and tore a ligament. We hope he will soon be up and about again. 4885 sends greetings to all old friends. Local members are looking forward to the Social at St. Saviour's Rooms, Arkwright Street, Nottingham, at 6 p.m. on December 18, when a meal and entertainment will be provided at an inclusive charge of 4s. 6d. The Deputy D.R. and T.R.'s send Xmas greetings to all members at home and abroad. G8DZ.

DISTRICT 5 (Western)

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

Bristol.—The November meeting was poorly attended, only six members being present. Whilst realising the difficulties of the present time, it certainly seems that interest in the town is very low. All recent meetings have been held in the centre of Bristol to enable members to get to them easily, and suggestions have been asked for but without any appreciable response. The D.R. is therefore forced to the conclusion that, apart from the faithful few, no one else has the time or inclination to put in an appearance. No meeting is being held in December, but a start will be made again in the New Year. The attendance recorded then will largely determine the arrangements for future meetings.

G5UH reports in a letter to the D.R. that he is still running across amateurs in the Services. He has also visited SU1SG and SU1RD and hopes to attend the next Cairo meeting. G4FV has now joined his section. The D.R. sends Xmas and New Year Greetings to all members of the District at home and overseas. G6RB.

DISTRICT 6 (South Western)

D.R.: M. B. Sydenham, B.Sc. (G5SY), Sherrington, Cleveland Road, Torquay. Torquay 2097.

Torquay.—The D.R. recently received a welcome visit from 2927, home on leave after three years in Southern Rhodesia. His friends will be pleased to know that he is in excellent health. The T.R. (G2GK) states that several members would support a meeting. It has been decided, therefore, to hold a meeting at the home of the D.R. on Sunday, December 19, at 3 p.m. It is hoped that there will be a good attendance. 2FBW has reported.

Exeter.—We learn from G5QA that Mr. Webber, G5YR is now back home after his serious illness. Mr. Jago is ill, and is shortly to undergo a blood test (quick recovery OM).

North Devon.—For some reason the notes for last month went astray. The D.R. does not recollect receiving them, but he apologises if they were lost at his end.

A welcome is extended to Sgt. Farrell, G2MA, and Cpl. Gittins, G5IF, who have recently been transferred to N. Devon. As G5IF's home is in Torquay, the D.R. feels a personal interest in the matter, and is glad to know that he is stationed quite close to G3BO.

Best wishes for Xmas and the New Year to Council, H.Q.'s Staff, and all members of No. 6, wherever they may be. G5SY.

DISTRICT 7 (Southern)

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

The D.R. and T.R.'s extend seasonal greetings and best wishes for the New Year to all District 7 members at home and abroad.

Bournemouth.—2HNO who is still taking medical treatment in London, hopes to be home for Xmas. 4449 has been away on duty but has now returned. 6915 has visited local members. The old regulars 2NS, 2RZ, 2HNO, 3BM, 4MY and 4449 still going strong send wishes for 1944. *via* 2NS.

Coulsdon.—BRS5124 in a letter posted somewhere at sea, says that sometime ago he passed the P.M.G. Special Certificate and is now serving in the M.N. as second radio officer. So far he has made two trips without incident, except meetings with several W's. He sends best wishes to all in this part of the District. *via* 3003.

Croydon.—BRS6653 has only met three other members since joining the Forces. He was with 2HHX for a while. He concludes his letter with the remark "thank heaven for the BULL." SU5KW is again abroad. (Good luck, OM, hope to hear from you when you get settled.) 2HNO has been to the Croydon meetings recently and enjoys them very much. See Forthcoming Events for details of the next meeting. *via* G2DP.

The D.R. would like to express his thanks to the T.R.'s in District 7 who have throughout 1943 maintained local activities and supplied the material for these notes. G5WP.

DISTRICT 8 (Home Counties)

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

Cambridge.—Since writing last month's notes only one member has actually contacted the writer regarding the proposal to run another social function. It certainly seems strange that the local members will not take the trouble to drop a line stating what they would like. It is firmly believed (judging from the success of the previous functions) that such gatherings are desired, but until a note is sent in by members showing this to be the case, it is absolutely impossible to ask any catering establishment to loan a room on a chance basis, so please *do* write.

G5JO acknowledges a letter from A. R. Watson who is at present in Italy, he has met G5PA (R. Signals) and is fit and well.

The D.D.R. takes this opportunity of wishing all members the Compliments of the Season. G5JO.

The Council has pleasure in announcing that

R. L. SMITH-ROSE

D.Sc., Ph.D., M.I.E.E., D.I.C., A.R.C.S.,
(Honorary Member)

will deliver a Lecture to the Society entitled

"MEASUREMENTS IN RADIO EXPERIMENTAL WORK"

at the

INSTITUTION OF ELECTRICAL ENGINEERS
Savoy Place, Victoria Embankment
London

On SATURDAY, DECEMBER 18th, 1943

FOLLOWING THE ANNUAL GENERAL MEETING
CONVENED FOR 2 P.M.

DISTRICT 9 (East Anglia)

D.R.: H. W. Sadler (G2XS), The Warren Farm, South Wootton, Kings Lynn, Norfolk. Castle Rising 233.

Norwich.—Congrats to G5IX, who has been promoted to Captain. 2MN reports seeing him and 5QO when they were home on leave recently.

Yarmouth.—F./Lt. Postle, 2FAO, reports meeting several members in the course of his travels. 2FAO understands that 3RW, who has been on the sick list for some time in the M.E. is likely to be home soon. We wish him a quick return to health.

Ipswich.—Mr. Wood, 6TI, has moved to Southwick, Sussex, where he hopes soon to be able to erect some favourite sky wires. His loss will be keenly felt by District 9. We wish him the best of luck in District 16. G2XS.

DISTRICT 11 (North Wales)

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

F./Sgt. Smith, G6FK, and Cpl. Cringan, VE4YG, one-time visitors to No. 11, report from the M.E. and India respectively. The latter has met F./Sgt. Wells, BRS4020, who also supported Prestatyn meetings. All three aspire to commissioned rank in the New Year, and send greetings to old friends in North Wales. We wish them well.

The D.R. hopes to be on leave from December 20 to 29 and looks forward to meeting local members.

Christmas cheer and a Bright New Year to everyone. Make a resolution to send in news each month so that we can keep No. 11 on the R.S.G.B. map. BRS1060.

DISTRICT 12 (London North and Herts)

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

North London.—Arrangements have been made for our Annual Christmas get-together to take place on Friday evening, December 17, at The Cock, Cockfosters. It is regretted that the notice is short, but all those who regularly support North London meetings will already have been notified. Last minute bookings for the set meal, a feature of meetings at The Cock, should be phoned through to the D.R. immediately. As usual the ladies will be warmly welcomed.

The November meeting held at 2DHF was attended by eight members who appreciated the hospitality meted out to them by their host and hostess (Mr. and Mrs. Stevens).

The D.R. and T.R.'s extend Christmas and New Year greetings to members everywhere. G5QF.

DISTRICT 13 (London South)

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

The November meeting brought together :—2DP, 2HP, 3DF, 3ST, 4NI, 2BLA, 2FWA, 2HHD, 2HNO, BRS1545, 3003, 4095, 6064, and 6915. After tea post-war conditions were discussed and many suggestions put forward.

Local members who wish to compete for the "Anne" cup are asked to attend a meeting at BRS4324, 3 Englewood Road, Clapham South, on Sunday, December 19, 3 p.m., when the judges will be present. We shall be pleased to see as many members as possible at this special Christmas meeting.

At the last meeting 2FWA kindly presented a B.B.C. ticket for a "Navy Mixture" performance which was raffled and won by Mr. Wallace ("Jock"). It was then put up again and sold to the highest bidder (2HP) for a further 2s. 6d. thus making a total, with the usual collection, of 18s. for the P.O.W. Fund.

In an airgraph F./Lt. Brabrook, G5ZD (Streatham), states that he has secured eleven new members whilst with the C.M.F. (Good work O.M.) He has 2DCG and 4710 with him and has contacted G6PK, 8KS, VP2BR, W3SIA, 7HWR, 8QEO and 8FJO. He is not looking forward to working a personal W.A.C. as it means service in the Pacific! G2GZ has passed his course as Signal Instructor (well done O.M., a pat on the back from all in the District).

Compliments of the Season and Good Luck to members everywhere. G3ST.

DISTRICT 14 (Eastern)

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

Chelmsford.—The November meeting held at 5242 (the P.A. Maestro!) was well attended. The D.R. was present, but we are assured that his presence in Chelmsford for two consecutive meetings was a pure coincidence. Frequency modulation and post-war amateur gear were the two chief topics for discussion.

5242 is doing extremely well in his recently established Radio Service Depot. A welcome is extended to Mr. D. Meads, a new member.

Romford.—A "revival meeting" of the Romford Amateur Radio Society was held on November 21 at the home of G3FT (Chadwell Heath), who was home on leave. Twelve members attended, including the Scribe and two other Chelmsford stalwarts—altogether a good muster, considering that it was a foggy day. G3FT, who spent some time in Gibraltar earlier in the war, gave an interesting account of life on The Rock. A collection taken on behalf of the P.O.W. Fund realised the sum of one guinea.

Arrangements are being made for another meeting to take place at the Society's old H.Q. (the Romford Y.M.C.A.) towards the end of January or early in February, and the Scribe hopes to see a record attendance. Details later. This meeting will be held on a Saturday. G6LB.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

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

West London.—The November meeting was supported entirely by BRS and A.A. members. Even the D.R. was prevented, owing to business, from attending. Those present included BRS 1357, 2741, 5533, 6487, 6701, 7085 and 2ADL. Thanks are recorded to Mr. and Mrs. Box for their hospitality. Owing to the proximity of Christmas no meeting will take place in December.

6275 offers a room at his home in Bedford Park for meetings. We thank him and hope it will be possible to accept his offer sometime. We reported last month that 3HS was stationed in India, whereas we now learn that he is in Bucks. (Apologies 'HS for any inconvenience caused by our error.—D.R.) Congrats to G3GY, now a S./Ldr. in the M.E. His only "local" contact has been with 4AR.

No news has come to hand from either Aylesbury or High Wycombe. G6WN.

DISTRICT 17 (Mid East)

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

There is very little activity to report this month. 6270 (R.A.F.) writes from the Potteries, where he is collecting U.H.F. experience. His home is in Sleaford, where he hopes at a later date to raise some activity. 4612 (R.E.M.E.) has as yet met no other member but hopes to do so when a Grimsby meeting is fixed. 2AUR, (R.A.F.) who reports from Sussex also appears to be getting in on the "ground floor" with U.H.F. He sends 73 to all old friends. More letters please.

The D.R. extends best wishes for the Season to all members. G5BD.

DISTRICT 18 (East Yorkshire)

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

Scarborough.—In an Airgraph to G6SO, Jack Cooper, G6CP (R.A.F., C.M.A.F.), states that he is gathering U.H.F. information which may be useful when he gets back on the air again. He sends 73 to his many friends. 6SO was pleased to receive a visit from Cpl. J. Coates, 3805, a wireless mechanic with the R.A.F., stationed in Chester. He is an old Scarborian who worked for several local radio firms prior to going to Whitby some years before the war.

Hull.—G3PL spent a fortnight in London recently on business and managed a tour of the radio shops collecting various components for a projected U.H.F. receiver. Contact was made with 4590 (also of Hull) who is stationed there and together they attended a meeting at the I.E.E. where they met a number of R.S.G.B. members, including 2VV. BRS1948 is the proud parent of a junior op. 2FGQ reporting from Scotland mentions meeting 6UV who is in good health. 5VS a leading telegraphist is believed to be in Hull but contact has not been made with him so far. 2HJZ reporting by air mail from the C.M.F. is working very hard but says life has some compensations with fruit and wine costing 1 to 10 cigarettes per basket or bottle as the case may be! He says the radio gear abandoned by Jerry is an amateur's dream and wishes he could get a couple of lorry loads home. Whilst in North Africa he tried to meet local amateurs but only managed to contact FA8ZZ's wife. *via* G3PL.

Best wishes to all at home and abroad for Christmas and the New Year, and may 1944 bring the return of our "tickets." G6SO.

DISTRICT 19 (Northern)

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

The only news to hand this month is from F./O. W. Stockburn, BRS6849, of Sunderland, who reports making many contacts while at No. 1 R.S. He would like to hear from members who were in the R.N.V.(W.)R. with him.

The D.R. takes this opportunity of sending Greetings and Good Wishes for Xmas and 1944 to members everywhere. G2FO.

Northern Ireland

D.R.: J. N. Smith (GI5QX), 19 Hawthornden Drive, Belmont, Belfast. Telephone: Belfast 63323.

Londonderry.—As the result of conversations between Mr. Hargen, 2DHB, and Mr. Brown, G6QY, arrangements were made recently to form a North West of Ireland Amateur Radio Society. At the inaugural meeting (attended by Messrs. Christophers, Woods, Mills, Corr, Fallon, Gallagher, Brown and Hargen), Mr. Brown was appointed Chairman, and Mr. Hargen, Hon.

(*Continued on page* 96)

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.

October 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 Monday, October 11, 1943.

Present.—Messrs. A. D. Gay (in the Chair), A. J. H. Watson, S. K. Lewer, D. N. Corfield, G. R. Scott Farnie, W. H. Matthews, W. E. Russell, E. H. Simmonds and J. Clarricoats (General Secretary).

Apologies were received from Messrs. Hunter, Jessup and Scarr.

1. It was unanimously resolved to elect 160 Corporate Members and 10 Associates. It was recorded that 30 applications for Corporate membership had been accompanied by references, and that the remainder had been sponsored by Corporate Members.

2. The monthly balance sheet and statement of account was examined and approved.

3. It was agreed to modify future printings of the Membership certificate by substituting the new design of Society badge for the present " T & R " badge.

4. It was reported that the Society's application for paper for reprinting the *Handbook and Supplement* would be referred to the Book Publishers' Advisory Committee.

5. It was agreed to take steps to arrange a further meeting with the G.P.O. early in the New Year.

The meeting closed at 7.40 p.m.

I.E.E. Meetings

As announced elsewhere in this issue, Dr. R. L. Smith-Rose (Honorary Member) will deliver a lecture (entitled " Measurements in Radio Experimental Work ") to the Society at the conclusion of the Annual General Meeting convened for 2 p.m. Saturday, December 18, 1943. The meeting will be held in the Lecture Theatre of the Institution of Electrical Engineers and will commence at approximately 2.30 p.m. Tea will be served, free of charge at 4 p.m. The Council trusts that every member in the London area will endeavour to attend on this occasion. Visitors will be cordially welcomed.

* * *

Some 50 members were present at the London meeting held at the I.E.E. on Saturday, November 27, to hear Mr. E. L. Gardiner, G6GR (President Elect) lecture on the subject of Valve Voltmeters. The Chair was taken by Mr. A. D. Gay, G6NF (President). Messrs. Dedman, Laister, Collier, Cullen, were among those who contributed to the discussion which was followed by a display of home constructed valve voltmeters. A vote of thanks to Mr. Gardiner, proposed by the President, was carried with acclamation.

I.E.E. Wireless Section

At the I.E.E. Wireless Section meeting to be held on Tuesday, January 18, 1944, Mr. J. A. Smale, B.Sc., will open a discussion on " Comparative Merits of Different Types of Directive Aerials for Communications." Tea will be served from 5 p.m. and the meeting will commence at 5.30 p.m. By courtesy of the Council of the I.E.E. Society members are invited to attend this meeting.

Headquarters Address

Numerous letters continue, in spite of previous notices, to be sent to the General Secretary's private address. Members are asked to note that the address of the Society is now: New Ruskin House, 28/30 Little Russell Street, London, W.C.1. Members who act as sponsors to applicants for membership are kindly requested to record the above address on the application form, if the latter bears the temporary war-time address of the Society, *viz.* 16 Ashridge Gardens, Palmers Green, London, N.13.

Changes of Address

Members who change their permanent address are reminded that at least one month must elapse before the change can become effective for BULLETIN despatch purposes.

The Society cannot, under existing conditions, send the BULLETIN direct to a Service address. Members on Active Service should arrange for re-direction from their home address. Provided re-direction is effected promptly, no additional postage is required.

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

D. G. Bagg, VP4TO, 12s. 6d.; S. Riesen, G5SR, 5s.; J. D. Veil, BERS491, 10s.; F. C. Smith, 5719, 5s.; Kathleen, Alice and Netta Hopcroft, £1 5s.; H. C. Turner, G5OJ, 15s.; E. Shields, 3462, 5s.; A. A. Chesters, 6s.; " The Grumblers " per E. W. Lark, 2CWO, £1; A. J. Mitchell, 2DLX 5s.; D. A. G. Edwards, G3DO, 15s.; F. H. Jackson, G2KZ, 5s.; J. Hamilton, 2BLJ, £1; A. T. Witts, £2 2s.; J. D. Chisholm, G2CX, £1 1s.; W. O. Wright, G6FQ, £5; J. Wilson, GM6XI, £1; L. Parnell, G8PP, 5s.; Masteradio, per S. L. Robinson, £4 5s.; District 13 per G3ST, 18s.; Mrs. Beautement, 10s.; A. W. Brookson, G3IP, 5s.; 2nd Stratton St. Margarets Boy Scouts Radio Exhibition, per Scoutmaster Drake, £1; J. B. Longridge, G3DN, 5s.; H. Millward, ZL2KN, 3s. 6d. **Receipts to date, £963 0s. 3d. Expenditure to date, £467 17s. 9d. Balance in hand as at November 30th, 1943, £495 2s. 6d.**

DESPATCHES.—Invoices covering the October and November despatches were not to hand at the end of November.

P.O.W. Fund

KEEP ON GRUMBLING!—The staff at Divisional Fire Force H.Qs, Beccles, have a " grumble box." It was emptied recently by Mr. E. W. Lark, 2CWO and the proceeds, amounting to £1 were sent to the R.S.G.B. P.O.W. Fund. Mr. Lark says their motto is " grumble as much as you like, pay a penny, and help to assist those of our comrades who have no opportunity to voice their grumbles." Keep on grumbling!

THANKS PAUL.—F/Lt. Paul Carment's (G5WW), offer of £5 for a bound copy of Volume II of *The Wireless World* was the highest received. The P.O.W. Fund thus benefits handsomely from the kindness of both donor (Mr. E. M. Elliott) and purchaser.

THANK YOU LITTLE LADIES.—Kathleen, Alice and Netta, daughters of Mr. W. G. Hopcroft, GM4AN, have sent a donation of 25s. to the Fund representing the proceeds of the sale of home-made calendars.

ANOTHER GOOD DEED.—The sum of £1 for the R.S.G.B. P.O.W. Fund was collected by 2nd Stratton St. Margarets (Swindon) Boy Scouts at a radio exhibition they organised last month. The Scoutmaster is Mr. L. E. Drake, BRS1753, 172 Oxford Road, Swindon.

What Offers

Mr. Paul Smith, **2FWV** of Westerham Hill, has donated to the Society for sale to the highest bidder, the following back issues of THE BULLETIN. Vol. 13 (Nos. 8–12), Vol. 14, Vol. 15, Vol. 16, Vol. 17. Proceeds to P.O.W. Fund. Closing date for bids December 31, 1943.

The President, Council and Headquarters Staff extend Seasonal Greetings and Best Wishes for the New Year to Members everywhere

THE SYNTHESCOPE—(*continued from page 85*)

modulator to change the frequency by the desirable ± 50 kc/s. For a general purpose instrument, a choice of I.F. to suit various receivers might be advantageous; a switch, selecting taps on L_1 would provide this facility. Note that when testing double superhets, only the first I.F. determines L_1C_1.

A concentric output socket is shown in the circuit and photographs; but a length of flexible screened cable may be permanently attached to the unit. Screened cable is essential so as to avoid signal pick-up into the input of the receiver.

Power supplies may be taken from the receiver if 3 amps at 4 volts and 250 volts at 20 mA. can be spared. Otherwise a built-in or separate power pack must be employed.

Four terminals are visible at the left-hand side of the photograph showing the underside view of the unit. These are marked "CAL" and "E" for the L.F. calibrating source live and earthy connections respectively; and "Time base" and "E" for the saw-tooth input voltage.

The four-way flexible connection and plug shown in the photograph carry H.T. and L.T. to the unit from an external general-purpose power supply.

THE POST-WAR AMATEUR STATION — (*continued from page 87*)

they will need to have the various services installed, before being employed as the site for a station. To maintain frequency stability, precautions will also have to be taken against condensation, draughts, and variations in temperature. Wood floors are preferable to concrete.

Finally, if the lay out of the post-war amateur station is given the consideration which it merits, a tidier and more efficient arrangement must result. This will in turn bring credit, not only to the owner, but to the amateur movement in general.

BRITISH ISLES NOTES AND NEWS—(*continued from page 94*)

Secretary and Treasurer. Meetings are to be held every Tuesday at 8 p.m., Mr. Gallagher having placed his office at the disposal of the new Society.

We are pleased to announce that Mr. J. Hargen, 2DHB, 8 Epworth Street, Park Avenue, has agreed to act as T.R. for 'Derry.

Belfast.—The T.R. reports that GI8GK and 3883 are constructing amplifiers. 2DYZ is building a capacity bridge and promises an article later.

We gather that GI5HU, like our worthy General Secretary, G6CL, has visions of his gear being confiscated again "after the war," as both now have daughters serving in the Signals branch of the W.A.A.F.!

The 20th Annual General Meeting of the City of Belfast Y.M.C.A. Radio Club was held on October 27 when the following officers for the year were appointed: *President*, J. Nickle, 2HCC. *Vice-Presidents*, J. N. Smith, GI5QX, and The Rev. W. E. Davey, B.A., BSWL330. *Chairman*, T. Linton, BRS3883, *Vice Chairman*, J. Jensen, 2DGU. *Hon. Secretary and Treasurer*, F. A. Robb, GI6TK, *Assistant Hon. Secretary*, R. S. Holden, GI5HU. *Committee*, Messrs. L. K. Winsor, G2FS, S. Black, GI3IA, R. Watson, GI8GK and W. Dickson.

It was agreed to recommence Morse classes as soon as possible. In this connection Mr. J. Colbourne, an old member of the Club just back from a long spell of service at sea, spoke highly of the assistance he had derived from Morse classes arranged in past years by the committee.

Visiting members are assured of a hearty welcome at Wednesday evening Club meetings. GI5QX.

Scotland

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

"A" District.—Those present at the November meeting were pleased to welcome GM2KP home on leave after 11 months in Algiers; 2FHZ was also present. We are indebted to Mr. Tait who at the last moment and without any previous notice gave a demonstration of Contrast Amplification. 2FZT, an engineer on a rescue ship, has been home for a few days.

"H" District.—GM3ND, who was recently in Cairo, has now moved on to somewhere in North Africa. 8KQ has rejoined his ship and is again on the high seas. 8MQ reports, but has no fresh news. 2NQ has met several amateurs, including 8SQ, who sends 73 to all old friends in "H." The D.O. sends Christmas greetings and best wishes to "H" members abroad and at home.

The writer of these notes joins in sending seasonal greetings to all members. GM6ZV.

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