R·S·G·B BULLETIN

AMATEUR RADIO

November 1949

The original front cover for this edition was not available.

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The Incorporated Radio Society of Great Britain

COUNCIL 1949

REPORT OF THE HONORARY TREASURER

INTRODUCTION

IT will be noted that the annexed accounts are for a period of only nine months, the Society having changed its accounting date in order to be able to hold the Annual General Meeting in December as required by the Articles of Association and at the same time comply with the requirements of the Companies Act, 1948, as to notice of meetings.

This change in the accounting date makes the comparison of the figures for the past nine months, with those of the preceding year, not only a little difficult but of doubtful value.

It is proposed, therefore, to refer mainly in general terms to the results for the nine months to 30th June, 1949.

INCOME

Subscriptions

Proportionately, the revenue from subscriptions is down by about £200, but this relatively small decrease (owing to the cushioning effect of the reserve for subscriptions paid in advance) does not fully reflect the continuing fall in membership which was referred to in my report last year. The first three months of the current year (July to September, 1949) show a decrease of approximately £100 per month.

American Publications

Owing to the devaluation of the pound, the cost to members of the American publications, hitherto so popular, will, of course, be considerably increased and this will almost certainly greatly reduce the demand for them. At the time of drafting this report it is not known whether members will in the future be permitted to use up dollars to purchase American publications and it may well be that the revenue from this source in the future will prove to be non-existent. Finally, a loss has been incurred on the balance due to the American publishers at date of devaluation because the Sterling collected from members on a basis of $4.03 to the £1 has to be paid over at a rate of $2.80 to the £1.

(continued on page 4)

Incorporated Radio Society of Great Britain, New R

(COMPANY LIMIT

ACCOUNT OF THE SOCIETY'S INCOME AND EXPENDITURE

for the Nine Months ended 30th JUNE, 1949

Year ended 30th Sept., 1948				
£	£		£	£
		INCOME		
11,136		Subscriptions		8,174
		From Sales—		
638		Technical Publications	235	
534		American Publications and Sundry	468	
1,172				703
		Interest—		
		On Trustee Securities (Gross amount before deduction of Income Tax)	182	
342		On Bank Deposit Account	15	
19				
361				197
10		*Premium received on Conversion of Defence Bonds*		—
		Amateur Radio Exhibition, 1948—		
803		Revenue	759	
875		Less Exhibition Expenses	552	
72 (*loss*)				207
12,607		Total Income		9,281
		EXPENDITURE—to be deducted		
528		Rent, Rates, Light, Heat, Water and Cleaning	420	
2,356		Salaries, Staff Pension Premiums and National Insurance	2,072	
40		Telephone Charges	27	
719		Printing and Stationery	393	
401		Postages	219	
488		Travelling, Entertainment and Meetings	254	
118		Representatives' Expenses	46	
149		London Meetings	89	
—		Regional Representatives' Conference, 1949	140	
425		QSL Bureau Expenses	335	
		R.S.G.B. Bulletin distributed free to Members—		
	£6,831	Printing Charges, etc.	£5,000	
	1,191	Less Advertising Revenue	1,282	
5,640			3,718	
73		Membership Certificates and Badges	60	
107		Awards and Trophies	89	
62		Repairs and Replacements	22	
5		Legal Expenses	11	
110		Accountancy and Audit Fees	105	
135		Sundry Expenses	71	
11,356			8,071	
		Amounts written off—		
	£18	Furniture and Fixtures	£3	
	169	Headquarters' Station	—	
187			3	
		Income Tax—		
		Deducted from Interest Received	64	
		On Trading Profit for the Nine Months to 30th June, 1949 (Assessable 1950/51)	82	
			146	
		Less Excess Provision in previous Accounts	5	
229			141	
11,772		Total Expenditure		8,215
£835		**SURPLUS OF INCOME OVER EXPENDITURE FOR THE NINE MONTHS TO 30TH JUNE, 1949, RETAINED IN THE SOCIETY AND ADDED TO THE ACCUMULATED FUND**		£1,066

uskin House, Little Russell Street, London, W.C.1.

D BY GUARANTEE)

BALANCE SHEET 30th JUNE, 1949

30th Sept., 1948 £	£		£	
		CURRENT ASSETS		
5,112		**Cash at Bank and in Hand**		6,299
75		**Tax Reserve Certificate**		75
		Debts due to the Society—		
	504	For Sale of Publications	244	
	241	„ Advertising	533	
	214	„ *Excess Profits Tax Refund*	—	
959				777
46		**Expenses Prepaid**		32
1,896		**Stocks of Publications, etc.** (as certified by the General Secretary)		1,320
8,088		Total Current Assets		8,503
		FIXED ASSETS		
		Investments in Trustee Securities (at Cost)—		
		Quoted (Middle Market Value £10,895)	£11,274	
		Unquoted (Defence Bonds)	2,000	
	13,274			13,274
		Furniture and Fixtures—		
		Net Book Value at 1st October, 1947	1	
		Additions since (at Cost)	21	
			22	
		Less Amounts written off	21	
	1		—	1
		Headquarters' Station—		
		Cost	250	
		Less Amounts written off	249	
	1			1
13,276		Total Fixed Assets		13,276
21,364		Total Assets		21,779
		CURRENT LIABILITIES—to be deducted		
		Sundry Creditors—		
	752	American Publications	76	
	1,110	Printing Bulletin	1,150	
	456	Accrued Expenses	505	
	62	Income Tax, 1949/50	90	
	2,380		1,821	
	5,936	**Subscriptions paid in advance**	5,684	
8,316				7,505
£13,048		**Surplus of Assets over Liabilities representing Revenue Reserves (below)**		£14,274
		REVENUE RESERVES		
11,000		**General Development Reserve Fund**		11,000
		Accumulated Fund—		
	1,158	Balance at 1st October, 1948	1,993	
		Add Surplus Income for the Nine Months ended 30th June, 1949, as shown by		
	835	Annexed Account	1,066	
1,993				3,059
55		**Reserve for Income Tax, 1950/51**		82
		Bevan Swift Account—		
—		Donations received		133
£13,048				£14,274

V. M. DESMOND, *President.*

A. J. H. WATSON, *Hon. Treasurer.*

W. A. SCARR, *Vice-President.*

JOHN CLARRICOATS, *General Secretary.*

REPORT OF THE AUDITORS TO THE MEMBERS OF THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN

We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit. In our opinion proper Books of Account have been kept by the Society so far as appears from our examination of those Books. We have examined the above Balance Sheet and annexed Income and Expenditure Account, which are in agreement with the Books of Account. In our opinion and to the best of our information and according to the explanations given us the said Accounts give the information required by the Company's Act, 1948, in the manner so required, and the Balance Sheet gives a true and fair view of the state of the Society's affairs as at 30th June, 1949, and the Income and Expenditure Account gives a true and fair view of the Excess of Income over Expenditure for the nine months ended on that date.

Thames House,
Queen Street Place, London, E.C.4.
22nd September, 1949.

EDWARD MOORE AND SONS,
Chartered Accountants.

Amateur Radio Exhibition

The first Exhibition was run at a loss and cost the Society £72. The second Exhibition shows a net profit of £207.

Bulletin Advertising

The revenue received from advertising for the nine months was actually £91 greater than the amount received in the whole of the preceding year.

EXPENDITURE

During the past nine months all items of expenditure have, as usual, been carefully scrutinised and all possible economies have been made, with the result that generally speaking the " budget " estimates made at the beginning of the financial period have not been exceeded.

SURPLUS INCOME

As a result of the unexpected windfalls from the Exhibition and advertising and the careful control of expenditure, income is in excess of expenditure to the extent of £1,066 with which result we may be well satisfied.

THE FUTURE

It would be most unwise to start guessing precisely what the future holds for us but all the present trends indicate that it will be a period of contracting revenue and expanding expenditure.

However, the Society's financial structure is sound and its reserves easily realisable and I have no doubt that it can ride out an economic storm and still remain strong enough to be able to cater adequately for the Radio Amateur.

A. J. H. WATSON, F.S.A.A.

Hon. Treasurer.

THE PILOT OFFICER NORMAN KEITH ADAMS PRIZE TRUST FUND
BALANCE SHEET 30th JUNE, 1949

	£ s. d.		£ s. d.
Trust Fund	150 0 0	**Investment**—£150 3% **Defence Bonds**	150 0 0
Undistributed Income for Nine Months, to date	2 5 0	**Cash at Bank**	6 15 0
Creditor—prize awarded under terms of Trust Deed for the year ended 30th June, 1949	4 10 0		
	£156 15 0		£156 15 0

V. M. DESMOND, *President.*

A. J. H. WATSON, *Hon. Treasurer.*

W. A. SCARR, *Vice-President.*

JOHN CLARRICOATS, *General Secretary.*

REPORT OF THE AUDITORS

We have audited the Balance Sheet as set forth above and have obtained all the information and explanations we have required. In our opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of affairs of the Prize Trust Fund as at 30th June, 1949, according to the best of the information and explanations given to us.

Thames House,
Queen Street Place, London, E.C.4.
22nd September, 1949.

EDWARD MOORE AND SONS,
Chartered Accountants.

INCOME AND EXPENDITURE ACCOUNT for the Nine Months ended 30th JUNE, 1949

	£ s. d.		£ s. d.
To Undistributed Income for the Nine Months, carried forward	2 5 0	By Interest on Investment	2 5 0
	£2 5 0		£2 5 0

R.S.G.B. BULLETIN

OFFICIAL JOURNAL OF THE INCORPORATED RADIO SOCIETY OF GREAT BRITAIN

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

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Contents

Forthcoming Events

REGION 1

Ashton-under-Lyne.—December 4, 3 p.m., New Jerusalem Schools, Katherine Street.
Bolton.—December 6, 8 p.m., Y.M.C.A.
Burnley.—December 7, 7.30 p.m., Mechanics Institute, Manchester Road.
Bury.—December 8, 7.30 p.m., Atheneum, Market Street.
Darwen and Blackburn.—November 18, lecture by Mr. A. Adams, "Design and Construction of a modern Preselector," 7.30 p.m., Y.M.C.A. December 2, business meeting. December 16, lecture by Mr. M. Jackson, "Problems of B.C.I. and T.V.I."
Manchester.—December 5, 7.30 p.m., Reynold's Hall, College of Technology, Sackville Street.
Oldham.—Alternate Wednesdays, 7.30 p.m., Civic Centre, Clegg Street.
Preston.—November 25, 7.30 p.m., Three Tuns Hotel, North Road.
Rochdale.—December 4, 3 p.m., Drill Hall, Baron Street.
Southport R.S.—December 19, 7.30 p.m., 38A Forest Road, Southport.
Wirrall A.R.S.—December 7, 21, 8 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—November 25, December 9, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—November 29, December 13, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Darlington.—Mondays (Morse only) and Thursdays, 7.30 p.m., British School Yard, Skinnergate.
Harrogate.—Wednesdays, 7.30 p.m., Rear of 31 Park Parade.
Hull.—November 30, 7.30 p.m., R.E.M.E. Barracks, Walton Street.
Newcastle.—November 21, 8 p.m., British Legion Rooms, 1 Jesmond Road.
Sheffield.—November 23, 7.30 p.m., Dog and Partridge, Trippet Lane. December 14, 7.30 p.m., Albreda Works, Lydgate Lane.
Spenborough.—November 23, December 7, 7.30 p.m., Temperance Hall, Cleckheaton.

REGION 3

South Birmingham.—November 20, December 4, 18, 10.30 a.m., Stirchley Institute.
Stourbridge.—December 6, King Edward's School. December 23, Christmas Party, Corn Exchange.

REGION 4

Mansfield and District R.S.—December 11, 3 p.m., Swan Hotel.
Derby and District A.R.S.—November 16, 23, 30, December 7, 14, School of Art, Green Lane, Derby.

REGION 5

Chelmsford.—December 6, 7.30 p.m., 184 Moulsham Street.

REGION 6

High Wycombe.—November 21, 7.30 p.m., G6IF, 5 Squirrel Lane, Booker.

REGION 7

London Meeting.—November 18, 6.30 p.m., Institution of Electrical Engineers, Savoy Place, Victoria Embankment, W.C.2. Tea 5.30 p.m. Lecture on "The Radio Control of Models," by Lt. (L.) G. C. Chapman, B.A., R.N., and Peter Cummins, A.M.I.E.E.
Barnes and Richmond.—December 13, 7.30 p.m., 28 Nassau Road, S.W.13.
Croydon (Surrey R.C.C.).—December 13, 7.30 p.m., The Blacksmiths Arms.
East London.—November 20, 2.30 p.m., Lansbourne Room, Ilford Town Hall.
Edgware (E. and D.R.S.).—November 16, 23, 30, December 7, St. Michael's School, Flower Lane, Mill Hill.
Enfield.—November 20, 3 p.m., George Spicer School, Southbury Road.
Finsbury Park.—November 22, 7.30 p.m., 164 Albion Road, N.16.
Hayes.—December 5, 7.30 p.m., The Vine, Uxbridge Road.
Hoddesdon.—December 1 and 15, 8 p.m., The Salisbury Arms.
Holloway (Grafton R.S.).—Mondays, Wednesdays and Fridays, 7.30 p.m., Grafton School, Eburne Road, N.7.
Peckham.—December 5, 7.30 p.m., The Kentish Drover, Rye Lane.
Southgate.—December 2, 7.30 p.m., Merryhills Hotel, Nr. Oakwood Station.
St. Albans.—December 14, 8 p.m., The Beehive, London Road.
Slough.—December 15, 7.45 p.m., Labour Memorial Hall, Chandos Street.
Welwyn.—December 6, 8 p.m., The Council Offices.

REGION 8

Brighton.—Tuesdays, 7.30 p.m., Eagle Inn, Gloucester Road.
Guildford.—December 11, 3 p.m., The Cinema Cafe, Woodbridge Road. A post card if attending.
Reading (R.R.S.).—November 26, December 8, 7.30 p.m., Abbey Gateway, The Forbury.
Southampton.—December 3, 7.30 p.m., 22 Anglesea Road, Shirley.

REGION 9

Bristol.—November 18, 7 p.m., Keen's Cafe, Park Row.
Exeter.—December 2, 7 p.m., Y.M.C.A., 41 St. David's Hill.
Plymouth.—November 19, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Judes.
Torquay.—November 19, 7.30 p.m., Y.M.C.A., Castle Road.

REGION 11

Rhyl.—November 27, 2.45 p.m., Crown Hotel.

REGION 13

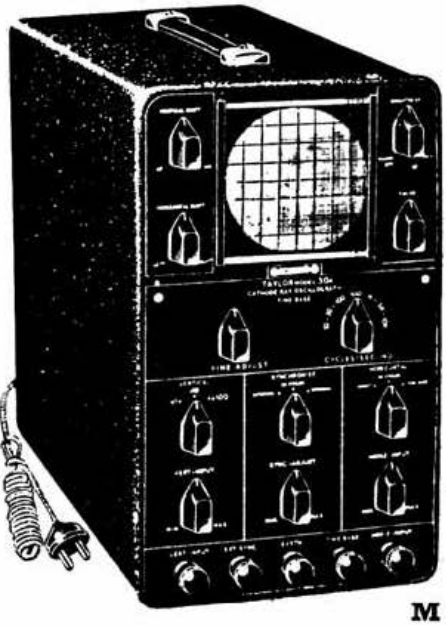
Edinburgh.—November 28, December 12, 7.30 p.m., Chamber of Commerce, 25 Charlotte Square.

REGION 14

Ayr.—November 30, 7.30 p.m., Royal Hotel, Prestwick.
Glasgow.—November 30, 7 p.m., 39 Elmbank Street.

WINDSOR

CATHODE RAY OSCILLOGRAPH



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R·S·G·B

BULLETIN

For the advancement of Amateur Radio

VOLUME XXV No 5. NOVEMBER 1949

A JOB WELL DONE

CONVENTION has come and gone and some 700 of our members have returned to their homes deeply conscious of a job well done.

When the original suggestion was made for holding a National Convention this year, it was only natural that some of us felt that it might be a gamble. We should be faced with the necessity for providing for nearly a thousand visitors. Where in the country could we find a catering organisation willing to provide a meal for so many people? Could it be held in London? If not, where?

The answer came in no uncertain terms from Council Member Ian Auchterlonie, G6OM: hold it at Belle Vue, Manchester. The next question was: can we run such a big event so far from Headquarters? "Give Manchester the job to do and Manchester will deliver the goods!" was the confident reply. So came into being the Convention Working Committee, under the able leadership of G6OM and George Webster, G5GK, with H. C. Daines, G5YD, Exhibition Manager; Harry Cox, G3BUI, Honorary Secretary; Cyril Turner, G8NL, as Honorary Treasurer, and five committee members A. Brown, G2WQ, J. Wightman, G3AH, S. Levings, G3AO, J. Machent, G3SP, and H. Marshall, G4ND.

Although a close liaison was maintained with the Council and with Headquarters Staff, it was this indefatigable band of enthusiasts which did the lion's share of the work and stage-managed this tremendous undertaking so efficiently that the smoothness of the final organisation gave no hint of the dogged hard work put in by all concerned.

Not content with organising the Convention, the Committee also included a highly successful Exhibition. This was entirely their own idea and to them alone is the credit due.

We feel it is only right that due recognition should be accorded to the men on the job, and gladly place on record the thanks of all those who enjoyed the fruits of their labours.

What of the future? Where will the 1950 Convention be held? Can it take place in Birmingham or some other Midland centre? The poor attendance at Manchester from London and the south would seem to indicate that the venue must vary from year to year.

Will it be possible to stage a 1951 Convention in London during the Festival of Britain Exhibition with hotel accommodation at a premium? What about Brighton or Southend-on-Sea or some other seaside resort either before or after the main holiday season? We shall be grateful for any assistance from members who can suggest suitable places, bearing in mind that at least three days are involved, and that up to 1,000 people will require two one-sitting meals and adequate accommodation for one large meeting, in addition to several lectures, film shows, etc.

A high standard has been set by our experience in Manchester; if Convention is to be even bigger and better each year, we shall need the help and co-operation of every keen member.

One more big event remains to complete this year's calendar; the R.S.G.B. Amateur Radio Exhibition at the Royal Hotel, London, from November 23rd to 26th.

A comprehensive display of all the latest commercial apparatus will be on show, together with specialised items of equipment produced by members of the Technical Committee. The Exhibition provides an unique opportunity for members to inspect what the Radio Trade has to offer, in the atmosphere of a pleasant social occasion. This is the chance to meet new and old friends of the air. So, see you at the Royal!

A.O.M.

CLIPPER-FILTER SYSTEMS

By H. WHALLEY*
G2HW

IN recent years, renewed interest has been shown in the use of speech limiters, or " clippers," followed by a low-pass filter (1). The object of such an arrangement is to increase the audio signal at the receiver and reduce side-band splatter. A number of articles (2, 3) on the subject have been published and these have encouraged many amateurs to try out the system with varying degrees of success. A clipper-filter system may not fulfil expectations in that either the audio present at the receiver does not appear to be any greater or, in spite of an apparently good filter, splatter is by no means suppressed.

Basically, a clipper-filter system will give the same increased audio power (and distortion) as severe over-modulation but without the usual side-band splatter. It is unfortunately true to say that by the time the audio gain at the transmitter has been advanced sufficiently far to produce reports of " full modulation," the transmitter is usually being overmodulated on peaks. If transmissions have consistently been overmodulated in the past, obviously, there will be little improvement in speech strength when a clipper is installed. In spite of this personal disappointment in the apparent performance, neighbouring amateurs will be delighted because they will now be able to work on the band without experiencing trouble from splatter. What often happens, however, is that the anticipated improvement in *speech* strength (not carrier level), of between one and two S points, is achieved but splatter has become very severe. This can be due to a number of causes some of which have received little attention in previous articles dealing with clipper-filter systems.

Differentiation

Differentiation, or " tilting " as P. F. Cundy calls it, is a common phenomenon to amateurs familiar with radar techniques. It is caused by the use in R.C. coupled stages of time constants which are too low or to inadequate primary inductance in the transformers which follow the clipper. Put another way it means that the low frequency response following the clipper is not good enough.

Fig. 1a shows a sine wave which has been effectively clipped and hence appears as a square wave—probably the worst possible case. When such a wave is passed through a circuit with a poor low frequency response the square is distorted to the shape shown in Fig. 1b. If the low frequency response is really bad then the effect shown in Fig. 1c results.

Note that in every case the vertical portions of the waves are of equal height, but that the peak-to-peak voltage of Fig. 1c is twice that shown in Fig. 1a. Thus, if the clip level has been set at, say, 1 kc/s. (where differentiation would be negligible) so that the transmitter was modulating 95 per cent., then for the *same* input voltage to the clipper at 50 c/s. (assuming the case of Fig. 1c) the modulation would be 190 per cent. and splatter would result.

It is unlikely that the filter would protect the carrier from overmodulation as, with a pass-band of 3·3 kc/s., up to the 66th harmonic of 50 c/s., will have free passage and the wave shape of Fig. 1c will hardly be modified at all by the filter.

* *H. Whalley, M.Sc., A.M.Brit.I.R.E., 2 Park Road, Sale, Cheshire.*

Effect of the Filter

It does not appear to be generally realised that under certain circumstances it is possible to obtain from a low-pass filter an output signal having a higher peak-to-peak value than that of the input signal. (1)

It can be shown that any recurrent waveform is made up from a fundamental sine wave, combined with harmonics thereof, having the appropriate amplitudes and phase relationships. In the case of an ideal low-pass filter having a cut-off frequency f, all input waves, no matter how distorted, with fundamental frequencies between $f/2$ and f will emerge as sine waves. If the distorted wave is a sine wave with positive and negative peaks equally clipped—*i.e.* it is a symmetrical wave—then it will be made up of a fundamental sine wave together with only *odd* harmonics. Hence, all input waves of this type having fundamental frequencies between $f/3$ and f will emerge as sine waves. Thus, if the cut-off frequency of the ideal filter were 3·3 kc/s., all output waves between 1·1 kc/s. and 3·3 kc/s. would be sinusoidal in form. For input frequencies higher than 3·3 kc/s. there will, of course, be zero output.

Consider the worst possible condition, *i.e.* a square wave input such as *a* in Fig. 2. In this case the output of the filter will be the sine wave *b* in Fig. 2. Note that

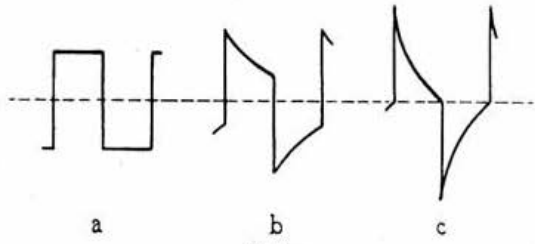

Fig. 1.
Fig. 1a shows a sine wave which has been effectively clipped. When such a wave is passed through a circuit with poor L.F. response the square is distorted to the shape of Fig. 1b. If the response is very bad the effect shown in Fig. 1c results.

b is greater in amplitude than *a*. It can readily be shown (4) that the amplitude of *b* (the fundamental component in *a*) is 1·3 times that of *a* and thus the clip level in this case should be set to about 75 per cent. at low frequencies if overmodulation is not to occur at the higher frequencies in the pass-band of the filter.

If overmodulation is present, splatter will result and this seems certain to occur with all the simple high level series diode slippers, because they all clip at 100 per cent. modulation and ignore the voltage rise in the following filter. Adjustable high level *shunt* diode clippers can be made to operate satisfactorily.(5)

Setting-up Technique

If an attempt is made to adjust the clip level to, say, 95 per cent. modulation at some fixed medium frequency (such as 1 kc/s.) using a modulation meter, there is a very real danger that severe overmodulation will occur at low frequencies, due to differentiation, and at high frequencies within the pass-band, due to voltage step-up in the filter. It is most likely that a modulation meter will not show this intermittent overmodulation due to the sluggishness of the movement, even though it be quite lightly damped. This is a disadvantage of modulation meters in general and it cannot be too strongly stressed that a C.R.T. system of modulation checking is almost an essential part of a clipper-filter system. A modulation meter may be used as a poor alternative provided that a variable audio frequency oscillator is available as a constant

voltage source and that the whole audio range of frequencies within the pass-band of the filter is checked for overmodulation.

When a C.R.T. is used it is possible to shout into the microphone and adjust the clip level until the carrier *never* overmodulates. When so adjusted it may be found that a prolonged whistle into the microphone will show an appreciably lower clip level (lower depth of modulation) than will typical speech peaks. This is due to the difference between transient and steady-state conditions in the modulator and clipper. For example, if the clip level bias is not obtained from a battery or low resistance bias source, then, due to the current flowing through the bias supply, the bias voltage will be different with a steady sine wave modulation from that obtained with no signal, or with intermittent speech. A very large condenser (greater than 500 μF.) decoupling the bias source will improve matters. With all types of modulators, other than Class A, the high tension will be of lower voltage with a steady sine wave input, than with intermittent speech and thus there will be a greater modulator output on speech peaks than with a prolonged whistle. The higher the value of the output condenser in the modulator power supply the more pronounced will be the effect, but other considerations may well prevent any reduction in this capacitance. Unstabilised screen grid supplies in tetrode modulators will produce a similar effect.

Hints on Filter Design

It is not proposed to present filter formulæ as these are readily available elsewhere. [6, 7] From a practical point of view the inductors are likely to be the major problem for the average amateur. A high Q is desirable and this can be obtained by using laminated iron or special alloy cores. However, as is well known, the inductance of iron cored devices varies with the amount of D.C. flowing through and the A.C. voltage across the winding. Minimising these effects is a job for the expert and, in general, the wisest course is to leave such inductors severely alone and concentrate on the air cored type. These latter can be readily calculated with fair accuracy. [8,9] By reducing the calculated number of turns and then restoring the inductance by the use of iron *dust* cores (usually a cut and try process) the Q can be much improved. *Salford Electrical Instruments, Ltd.*, Type 46 cores have been found quite useful in this respect and 0·5 H. coils with a Q of 15 at 1 kc/s. are easily made.

Fortunately, the Q has little effect on the attenuation outside the filter pass-band, the main result of low Q being that the frequency response will fall off slightly before the theoretical cut-off frequency is reached. Satisfactory filters have been made with values of Q as low as 6, and it is fairly true to say that if the wire size is generous for the amount of D.C. flowing in the coil, the Q will be high enough to give reasonable performance. Coils should not be mounted within one coil radius from metal chassis or shields.

Inductance can be measured fairly accurately by using a good quality multi-range test meter and a low voltage source of A.C. such as 6·3 V. Measure the resistance of the coil, then connect it across the A.C. supply and measure the applied voltage and current flowing. If R is the resistance in ohms, E the voltage, I the current in amperes and L the inductance in henrys.

$$\text{then } L = \frac{1}{314}\sqrt{\left(\frac{E}{I}\right)^2 - R^2}$$

Inductors and capacitors with 10 per cent. tolerance will give fair filters, but 5 per cent. components are preferable.

Built-out Modulation Transformers

All transformers have leakage inductance, which results in attenuation of the higher audio frequencies and may give rise to amplitude distortion because the load line on the valve characteristic degenerates into an ellipse. However, the leakage inductance can be utilised, together with condensers connected across the primary and secondary windings of the transformer, to form a π-section filter. This technique has been called "building-out."

Bain[10] gives, in detail, an experimental method for determining the correct values of the primary and secondary condensers. In brief, the transformer (with the correct value of load resistance across the secondary) is connected with its primary in series with a calibrated variable resistor across the output of a variable audio frequency generator, such as a B.F.O. covering 0–12 kc/s. At any given frequency, the variable resistor is adjusted so that equal voltages (as measured with a valve voltmeter or C.R.T.) appear across it and the transformer primary. The magnitude of the impedance looking into the transformer primary is then equal to the resistance of the calibrated resistor. With a perfect transformer the impedance should, of course, be constant throughout

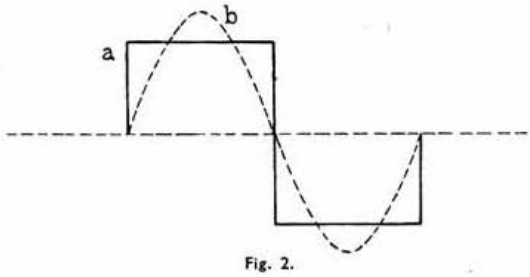

Fig. 2.

the audio frequency range. In practice, due to the leakage reactance, the impedance rises at the higher audio frequencies to two or three times the nominal value.

Various values of condensers are connected across the secondary of the transformer and frequency v impedance curves are taken for each value. The correct value is that giving the most constant impedance over the greatest frequency range. The secondary condenser is then disconnected and the process repeated for different condensers across the primary. Using the same criterion as before, a suitable primary condenser can be chosen by inspection of the curves. If the apparatus is available the work can be done in about one and a half hours.

When the transformer is used in the modulator, with the experimentally determined primary and secondary condensers and the same value of load resistance as used in the tests, the frequency response will be level up to some cut-off frequency above which the output will fall rapidly. The rated input of the transmitter determines the value of the terminating resistance, and the leakage inductance is a property of the transformer, so it will be obvious that the cut-off frequency is automatically fixed. It can be modified if external inductance is added between the transformer secondary and the secondary condenser but this detracts from the simplicity of the scheme. In general, the higher the leakage inductance the lower will be the cut-off frequency.

Unfortunately, some modulation transformers on the amateur market do not build out at all nicely. This is because, as one might expect in good quality transformers, their leakage inductance is too low. If you wind your own transformers, interleave the two halves of the primary winding as this will give tight coupling and reduce transient oscillations[11] which are another cause of splatter. Do *not* interleave

primary and secondary windings. This will give fairly high leakage inductance and a good chance of using the transformer as a filter section by building it out.

Built-out transformers are of little help with high level clippers as in these cases the clipper follows the transformer.

Where to Filter

With a high-level clipper the only feasible position for the filter is immediately preceding the modulated R.F. stage.

Most low level clipper circuits show the filter immediately following the clipper. This has the advantage that no high audio frequencies are applied to the modulator proper and hence there is less chance of parasitic oscillations (ringing) being produced in the Class B stage due to leakage inductance in the driver and output transformers. [11, 12]

All modulators distort and a figure of 5 per cent. is quite low for most amateur equipment. In a push-pull stage this distortion is likely to be mostly third harmonic, and thus, even though the input to the modulator never exceeds 3·3 kc/s. due to previous filtering, splatter at 10 kc/s. off-tune will be only four S-points below maximum signal level. Hence there is a sound case for at least one π-section filter between the modulator and the modulated R.F. stage even if an excellent low level filter is already installed. This high level filter is to remove splatter due to modulator distortion and is well worthwhile fitting irrespective of whether a clipper is used or not. [13]

How Much Filter?

From a perusal of current literature dealing with filters, it is difficult to obtain a clear indication of the number of sections which are *really* necessary.

If we accept the statement that local amateurs up to a radius of about 5 miles are the people who will suffer most from splatter, [13] then within this range a received carrier level of " 30 db. above S9," or 84 db. above S-zero might well be obtained. It is desirable that local stations should be able to receive fairly weak stations at 10 kc/s. from the transmitter under consideration.

Now it is reasonable to expect an attenuation of 25 to 30 db. at three times the cut-off frequency for a single π-section filter. Assume that a cut-off frequency of 3·3 kc/s. is chosen. This may shock high-fidelity enthusiasts, but is it so important when it is remembered that in all probability the transmission is being received on a 3 in. speaker after passing through a crystal filter backed by a Q-fiver! Except perhaps on the U.H.F. bands there is no room (literally) in Amateur Radio for wide range speech, and any attempts at such should be considered anti-social. Actually, good quality speech when cut-off at 3·3 kc/s. sounds quite pleasant. If, then, 3·3 kc/s. is decided upon, a single prototype π-section will give 30 db. attenuation at 10 kc/s.—which looks fine on squared paper but in practice is 54 db. (84—30) or S9 on the air! Another similar section would reduce this by a further 30 db. to S4, which is a reasonable level.

Ideally, then, two π-sections will just about suffice. If constant modulator loading is required over the audio range in the pass-band, then this can be achieved—and even better filtering obtained—by terminating the above filter with the usual m-derived half sections with $m = 0{\cdot}6$. These terminating half sections are very desirable but not absolutely essential. If the modulation transformer is built out then one π-section may be omitted.

A single m-derived section, as specified at one time in certain American clipper circuits, is almost useless for splatter suppression because it is unlikely to give more than about 15 db. attenuation at three times cut-off frequency.

A single π-section will give fair results. For example, using a self-clipping choke modulator without a filter on 1·7 Mc/s., the S-meter on an H.R.O. receiver at about one third mile range kicked up to S9 at 30 kc/s. off-tune due to splatter. With a single π-section filter (having a nominal cut-off at 3·6 kc/s.) installed between modulator and P.A., the S-meter did not kick at all under the same heavy modulation condition and splatter was practically inaudible.

Conclusion

Figures quoted above are not necessarily strictly accurate, but they are sufficiently so to indicate the order of the various effects. In particular, it is unlikely that clipping will be used to the extent that true square waves are produced and hence the notes, based on square waves, paint a pessimistic picture. The effects, however, are quite marked, as can easily be demonstrated experimentally. Important points may be summarised as follows.

1. When using low level clippers cut bass—if deemed desirable—*before* the clipper. The low frequency response after the clipper must be very good.

2. Avoid the use of high-level series diode clippers. High level shunt diodes with a clip level control can be quite good.

3. If it is decided to filter at low level, at least one section of high level filter is desirable between the modulator and the modulated stage to remove the splatter effects of harmonic distortion in the modulator.

4. A single m-derived section is very poor, a single π-section is fairly good. Two π-sections should be adequate, in practically every case.

5. Always set the clip level on speech input to the modulator, preferably using a C.R.T. indicator.

If the above principles are correctly applied a satisfactory clipper-filter system should result.

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The R107 and T.V.I.

MR. A. J. HUDSON, BRS17511, has found that the oscillator section of the ex-Government receiver type R107 can cause interference to television reception at distances of the order of 400 yards. In a number of cases harmonics up to the fifth have proved troublesome. While some improvement can be effected by fitting a 45 Mc/s. wavetrap in the aerial lead *inside* the receiver cabinet, it would appear necessary, for complete suppression, to proceed along lines similar to those described in the article " The HRO and T.V.I." published in the August, 1949, issue of the BULLETIN.

A CRYSTAL CHECKED FREQUENCY METER

WHEN you, as either a transmitting or receiving amateur, read in "Month on the Air" that such and such a "rare" station is to be heard on say 14035 kc/s., can you tune your receiver near enough to that frequency to be sure of hearing him? If you are requested to QSY to a specified frequency, can you do so with every confidence that your own particular calibration is to be relied upon? When you use a V.F.O., can you set it with sufficient accuracy to satisfy the G.P.O. that you are within 0·1 per cent. of the frequency you enter in your log?

By

J. N. WALKER

G5JU

Leading questions! But, only if you can answer them all in the affirmative, is your station properly equipped. Many readers, however, find it difficult to measure frequency to the necessary degree of accuracy to fulfil these requirements and will, therefore, be interested in the frequency meter to be described.

First of all, why a frequency meter? Why not build the instrument as a calibrated V.F.O.? For several reasons. It is of prime importance that the self-running oscillator should possess very high stability—both short and long period. With a frequency meter—where the question of power output and keying is not of importance—it becomes possible to concentrate upon stability, whilst, at the same time, the design can be simplified in other directions—notably, in the reduction of the number of valves, power supplies and overall size.

Again, when used in a transmitting station, the high degree of accuracy incorporated in the frequency meter permits simplification of a V.F.O. tuning dial—the calibration marks on the latter can be comparatively rough. Also, when setting the receiver, there is no need to switch on any part of the transmitter. Finally, a frequency meter can be of considerable benefit to the non-transmitting amateur who has no need of a V.F.O.

The Circuit

The circuit used in the frequency meter to be described (Fig. 1), is a little unusual in some respects and detailed comments may be helpful.

The variable oscillator circuit although based on the well-known Franklin has several important variations. The high constancy of the Franklin is due to the use of coupling condensers of very low capacity, which prevent changes of valve characteristics or temperature, etc., having any appreciable effect on the operating frequency. "Miller effect," very important with triode valves, is also much reduced—or, if not actually reduced, is side-tracked. In the circuit shown, not only is the coupling capacity

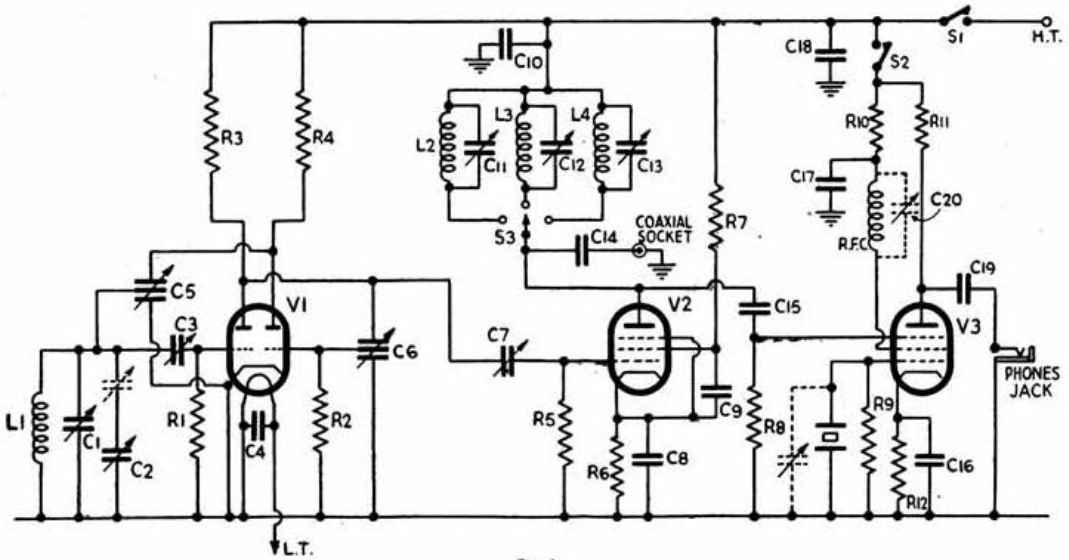


Fig. 1.

Circuit of the Frequency Meter, including crystal check facilities.

C1	100 $\mu\mu$F High Stability Variable. *Eddystone*. Cat. No. 738.	R3, 4	20,000 ohms ½ watt.
C2	15 $\mu\mu$F Variable. Cat. No. 580	R5, 8, 9	470,000 ohms ½ watt.
C3, 7	10 $\mu\mu$F Concentric Air Trimmer, set at about half max. capacity.	R6	330 ohms ½ watt.
C4, 8, 9, 10	·001 μF Moulded Mica.	R7	47,000 ohms ½ watt.
C5, 6	25/25 $\mu\mu$F Differential. *Eddystone*. Cat. No. 719.	R10	100,000 ohms ½ watt.
C11, 12	3/30 $\mu\mu$F Trimmers. (*Philips or Mullard*).	R11	68,000 ohms ½ watt.
C13	3/30 $\mu\mu$F Trimmers. (*Philips or Mullard*).	R12	2,700 ohms ½ watt.
C14, 15	6 $\mu\mu$F Ceramic.	R.F.C.	*Eddystone*. Cat. No. 1066.
C16, 17, 18	·01 μF Paper.	L1	30 turns 24 S.W.G. 1½" Former slightly spaced.
C19	·1 μF Paper.	L2	24 turns 26 S.W.G. 1½" Former slightly spaced.
C20	100 $\mu\mu$F (if required).	L3	12 turns 26 S.W.G. 1½" Former spaced one diameter.
R1, 2	250,000 ohms ½ watt.	L4	5 turns 26 S.W.G. 1½" Former spaced two diameters.
		V1	B65 (*Osram*), ECC33 (*Mullard*) or 6N7.
		V2, 3	EF50 (*Mullard*).

low but an added amount of stable capacity is placed in parallel with the valve electrodes, thereby reducing still further the effect of the valve on the tuned circuit. Thus the frequency stability depends almost entirely upon the design of the tuned circuit and upon the quality and rigidity of the components used therein. For instance, all condensers including the coupling condensers are of the air-dielectric type. It has been found from experience that low capacity types of ceramic condenser suffer occasionally from a peculiar " twitter " effect, due presumably to the silver coating not being a continuous conductor to high frequency currents. Silver mica condensers are less troublesome but are difficult to obtain in values below about 10 μμF.

The coil is wound on a ceramic former and all insulation associated with the oscillator is ceramic, with the exception of the brackets holding the differential condensers. The oscillator components are grouped at one end of the chassis and kept apart from any source of heat, so that frequency variations caused by temperature changes are negligible. For two reasons the oscillator valve is mounted on pillars well above the chassis. The first is that R.F. wiring can be kept short and direct, without any " hot " leads passing through the chassis. The other is that the heat of the oscillator valve is dissipated above and away from the tuned circuit components. Insulating sleeving, where necessary, is of the telecothene variety.

The above points may appear individually unimportant, but collectively, they assist materially towards the desired object of obtaining high stability.

The oscillator amplitude is small and the valve operates under Class A conditions. The wave form produced is almost a pure sine-wave and is therefore comparatively free from harmonics—a good point in many ways but since harmonic frequencies are necessary for the present purpose the oscillator is followed by a high gain amplifier with switched tuned circuits in the anode circuit covering 7, 14 and 28 Mc/s. The oscillator itself runs on 3·5 Mc/s., and the frequency meter serves for checking on all four bands.

The third valve—a 100 kc/s. crystal oscillator—is admittedly a refinement but it does provide a definite means of checking the calibration of the frequency meter without the ambiguity which often occurs when beating an external crystal oscillator against received signals in the case of a superheterodyne receiver.

The design of this crystal oscillator is simple but effective. With the addition of an output point, connected *via* a 100 μμF fixed condenser to the " hot " end of the R.F. choke, this stage can be used to provide harmonics 100 kc/s. apart, for other purposes.

With a particularly active crystal, the 100 μμF variable condenser (C20) shown in dotted lines in Fig. 1 will not be necessary, but it may be desirable to include it to ensure ready oscillation. Also, where it is desired to adjust the frequency of the crystal to exact resonance, by zero-beating against Droitwich on 200 kc/s., the usual 50 or 60 μμF variable condenser should be placed in parallel with the crystal. Since most crystal manufacturers guarantee an accuracy to within ± 0·01 per cent., the fitment of such a condenser in the original model was not considered necessary.

Because of the additional heat which would be generated, it is undesirable to include a built-in power-pack, the omission of which also permits the frequency meter to be constructed in a more compact form. In the majority of cases, the necessary 6·3 volts, 1 ampere heater supply and 200 volts 12/15 mA. H.T. supply can be drawn from an existing power unit.

Small variations of H.T. voltage have negligible effect on the frequency and, since it is presumed that large variations of H.T. will not occur, there is little benefit to be secured from the addition of a voltage stabiliser valve.

Construction

A number of hints have already been given and the mechanical construction is left to individual choice. In the writer's case, the three valves and their associated components are mounted on an *Eddystone* diecast chassis, which, in turn, is enclosed in a cabinet.

The dial is an important item, if the full benefit of direct calibration is to be secured. The *Eddystone* Cat. No. 598 full vision dial has been found to be most satisfactory.

Frequency Coverage

The frequency coverage should be adjusted to suit the individual user, bearing in mind that the smaller the range, the greater the number of calibration markings that can be drawn and the greater the accuracy of the readings.

If one is interested in the whole of the 3·5 Mc/s. band, then obviously the fundamental coverage must be made 3500 to 3800 kc/s. Over the 100 division dial scale, this means 3 kc/s. per division and it will be somewhat difficult to read off to 1 kc/s. If this arrangement is adopted, then at around 14 Mc/s. the coverage becomes far greater than is required for checking amateur frequencies at this part of the spectrum. Much of the dial space is wasted and it becomes impossible to adjust the frequency meter with a high degree of accuracy.

As the writer requires the meter chiefly for use at 14 and 28 Mc/s., with occasional applications to 7 Mc/s. the coverage has been adjusted to 3500–3550 kc/s. This represents 14000–14200 kc/s. on the third harmonic, or 2 kc/s. per division and the accuracy of adjustment on all bands is then well within G.P.O. requirements

For the out-and-out C.W. enthusiast, the range could be still further restricted, with the benefit of even greater accuracy in setting the dial.

Fundamentally, the tuned circuit components L1 and C1, remain as given in Fig. 1, and the capacity of C2 must be varied to achieve the desired coverage. It should be noted that, if the coil size is correct, the circuit will tune to 3500 kc/s. with C2 at maximum and with C1 at near maximum. C5 also places about 25 μμF across the tuned circuit. Roughly, a sweep of 10 μμF is called for in C2—the *Eddystone* Cat. No. 580 microdenser, of 12·5 μμF maximum, is suitable, except where the range is considerably restricted. In the latter case, the same condenser will serve but in series with it (as shown in dotted lines in Fig. 1) should be placed another variable, insulated from chassis, of 50 or 60 μμF maximum. By suitable adjustment of this condenser any desired degree of sweep can be secured.

Preliminary Adjustment

The primary object is to bring V1 into stable oscillation—not the border-line condition where small changes of voltages have an appreciable effect, but just beyond, resulting in an output of small voltage amplitude.

The adjustments necessary to achieve this condition are interdependent but, in practice, have proved relatively simple. The concentric trimmer condenser used for C3 is set about half way (*i.e.* 5 μμF or so) and left at that position. C5 is adjusted with the rotor vanes fully meshed in the earthed stator vanes —the residual stray capacity to the stator sector connected to the second anode of V1 gives adequate coupling. Final adjustment is made with C6, rotation of which will throw the circuit in and out of oscillation. It should be set to a point a little way beyond that at which oscillation commences, as

indicated by a meter inserted in the H.T. supply to R3 and R4 : the anode current drops when the valve oscillates.

Calibration

With switch S2 closed and a pair of high-resistance telephones inserted in the jack, a beat note will be heard when the oscillator is tuned to 3500 kc/s., by adjustment of C1 (C2 at maximum). It is desirable to check, by any means available, that the frequency is actually 3500 kc/s.—not 3400 or 3600 kc/s., where again beat notes will be heard. Also, if a superhet. receiver is used for checking purposes, care must be exercised that confusion with the image signal does not arise. A further check, on any receiver, is that the spot at which the frequency meter signal is tuned should coincide with the edge of an amateur band, indicated by the absence (we hope) of amateur signals on slightly lower frequencies. (The transmissions from GB1RS will prove of value at this stage.)

Before proceeding further, it is advisable to tune the anode circuits associated with V2. The switch S3 is set to the appropriate band, as also is the receiver. The oscillator harmonic will be very weak to begin with but will come up in strength as the appropriate condenser (C11, 12 or 13) is adjusted to bring the circuit into resonance.

Leaving S3 in the 28 Mc/s. position, the dial can now be marked off at points 100 kc/s. apart *i.e.* 28,000 ; 28,100 ; 28,200 and so on. Figures can be inserted according to the bands the user is mainly interested in. As the scale is fairly linear, intermediate frequency settings can be judged with a fair degree of accuracy. Should a 60 Mc/s. converter be available, these intermediate points can be marked exactly, but it will be necessary to feed signals from both the 100 kc/s. and the self-running oscillator into the converter, the audible beats appearing at the receiver output. In every case, of course, the tuning of the frequency meter will be adjusted to the centre (inaudible) point of the beat note.

Practical Use

The frequency meter should be located within arm's length of the operating position and arranged to come into standby operation whenever the receiver is switched on. It has been found that a signal of comfortable strength is picked up by the receiver, without a lead being attached to the co-axial socket, providing S3 is set to the appropriate band (it is left at 7 Mc/s. when operating on 3·5 Mc/s.). In other cases, dependent on screening and stray radiation, it may be advisable to connect a short length of wire to the meter.

The frequency meter also acts as a receiver of low sensitivity and the signal from a nearby transmitter can be heard beating against the internal oscillator. In fact, the meter can well be used as a monitor, although, if only for convenience, it then becomes desirable to arrange either to switch the telephones from receiver to meter or alternatively, feed the audio output of the meter into the audio section of the receiver. It will also be necessary to add a further R/C coupled audio amplifier stage to the circuit given in Fig. 1, since the audio output from V3, by itself, is too small for comfortable listening.

Balloon Borne Aerials

MEMBERS who intend to conduct experiments with balloon-borne aerials should take note of the Air Navigation Order, 1949 (S1 1949, No. 349). Article 35 of the Order provides, *inter alia*, that a captive balloon shall not be flown at any place within the United Kingdom except with the permission in writing of the Ministry of Civil Aviation.

Application for such permission should be accompanied by the following information :—

(*a*) full description of the balloon and its cubic capacity,
(*b*) the purpose for which it is to be flown,
(*c*) the period or periods during which it will be elevated,
(*d*) the maximum height above ground to which it is proposed to elevate the balloon.
(*e*) method of mooring the balloon,
(*f*) either a 6 inch O.S. map indicating the precise position of mooring—or alternatively a clear statement by reference to two landmarks of such position.

Any application for permission should be addressed to the Ministry of Civil Aviation, R.L.3, Ariel House, Strand, London, W.C.2.

Fuller details of the conditions governing the flying of captive balloons are to found in the Order quoted above, and in Section XVI of the Air Navigation (General) Regulations, 1949 (S.1 1949, No. 374), copies of which may be obtained from any Sales Office of *His Majesty's Stationery Office* or through any bookseller.

The Society is indebted to Mr. C. W. Henderson, BRS18223 for forwarding the above information.

European Radio Programmes

The weekly magazine *European Radio Programmes* published every Friday, price 6d., contains day by day programmes of more than 20 European broadcasting stations as well as articles giving background information on the outstanding items of the week. Details can be obtained from BCM/E.R.P., London, W.C.1.

Single Side Band Transmissions

MEMBERS are reminded that the Post Office raise no objection to the use by amateurs of the single side-band system of transmission. A rumour has been current that this facility is not available in the U.K.

An official announcement appeared on page 319 of the June, 1949, issue of the BULLETIN.

High Power on the V.H.F's

AS the result of discussions which have taken place between the Society and the Post Office Engineering Department, U.K. amateurs are now permitted to use an input power of 150 watts on all frequency bands above 28 Mc/s., with the exception of the 420 to 460 Mc/s. band, where the 25 watts power limit still stands.

The new facility has been granted for a period of one year, at the end of which it will be reviewed in the light of the results achieved, and the number of interference complaints which have come to the notice of the G.P.O. Holders of 10-watt and 25-watt licences will, of course, have to observe the power restrictions imposed by their licences and will not be affected.

Licences were formally amended by a notice published in the " London Gazette " on October 18, 1949 from which date the concession became effective. This information was unfortunately received too late for inclusion in the October BULLETIN but immediate steps were taken to ensure widespread dissemination of the news. Some confusion was, however, caused by reports in the National Press which gave the impression that completely new V.H.F. bands were available to amateurs.

TELEVISION RECEIVER RADIATION

By JAMES N. ROE, M.I.R.E. (G2VV)*

THE growing interest in home construction of television receivers is opening up another field of interference problems affecting both short-wave listeners and TV viewers. The G.P.O. engineers are faced with a growing list of complaints in neighbourhoods where home-built receivers are in operation. This does not mean that *every* non-factory receiver is sure to cause trouble. Equipment built and/or tested by a competent engineer is, of course, capable of first class results.

The interference to nearby short-wave and V.H.F. receivers and television receivers can be produced by radiations from a drifting or unstable oscillator—in the case of a home-built superhet—or unstable R.F. stages in the case of a T.R.F. receiver. Some cases of interference from the time base circuits have been reported but the most serious—and the most common—cause of trouble is due to radiations from unstable tuned circuits.

The writer has had experience in checking this form of interference and the following details may serve as a guide to anyone suffering from "unaccountable interference."

On the 14 and 28 Mc/s. bands varying beat notes have been heard which tend to "creep" about more or less continuously. At frequencies in between these bands, beat notes can also be received. In one case oscillations were also heard as low as 7 Mc/s. Very strong beat notes have been heard on a V.H.F. receiver in the 144 Mc/s. band.

The most serious interference experienced is usually at 45 Mc/s.—the London vision transmitter frequency. Picture reception may suffer from drifting semi-vertical, close spaced, parallel lines, herring bone patterns in the centre—or one-half of the picture—running in a horizontal pattern. In some cases beat notes and spurious oscillations are very strong at the sound frequency—41·5 Mc/s.

The worst radiating receiver so far encountered was a T.R.F. job constructed to a very popular design. The set was reasonably well assembled and wired. The coils were home-made by the owner who—apart from having no technical knowledge—did not possess a meter or measuring device of any kind! The set was so unstable that it practically screamed when an approach was made to any control! In this particular instance the unstable stages were radiating so strongly that viewers up to a distance of about 500 feet were experiencing sound and picture interference.

It is not within the scope of these notes to go into details of the various forms of interference which an unstable set can produce. The purpose here is to indicate just how serious the trouble can be. Individual cases will have their own particular problems.

To newcomers to television construction it cannot be too strongly emphasised that expert advice should be consulted in checking the alignment of the tuned circuits. These circuits cannot be correctly aligned by ear. The use of a reliable signal generator is essential.

Most of the various kit receivers now being offered should be capable of trouble-free performance when correctly wired and aligned. Unfortunately the number of inexperienced constructors is rapidly increasing and it is in this direction that both amateurs and viewers are likely to suffer.

Where there is reasonable cause to suspect radiation from a nearby receiver (a badly aligned commercial set can also produce trouble of this nature) it is best to approach the owner and offer co-operation. In cases where the owner refuses assistance—and this is by no means unknown!—the G.P.O. should be given full details of the case.

In closing, the writer would like to place on record the excellent co-operation afforded by G.P.O. engineers in cases with which he has been directly concerned.

* 5 Gloucester Road, Hampton-on-Thames, Middlesex.

Variable Frequency Crystal Control

THE advantages of a "rubber" crystal which would give variable frequency control over a sufficiently wide band to permit the avoidance of heavy interference on the crystal frequency has long been recognised in amateur circles. Several simple methods such as the connection of a small variable capacity across the crystal have been fairly widely employed but these systems usually permit only a relatively small variation in frequency. In the December, 1948, issue of *Amateur Wireless*, journal of the *Wireless Institute of Australia*, Mr. J. G. Reed, VK2JR, gives details of an oscillator circuit which it is claimed will give a frequency shift of more than 1 kc/s. per megacycle, *i.e.* 7 kc/s. on 7 Mc/s., 14 kc/s. on 14 Mc/s., etc.

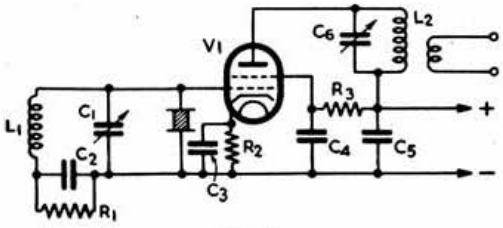


Fig. 1.
Circuit for Variable Frequency Crystal Oscillator.

C1	50 to 100 $\mu\mu$F. variable	R3	10,000 ohms.
C2, 3, 4, 5	·01 μF.	L1	20 μH. inductance.
C6	100 $\mu\mu$F. variable.	L2	30 μH. inductance.
R1	100,000 ohms.	V1	6V6 or 6F6.
R2	400 ohms.		3·5 Mc/s. "X" cut Crystal.

VK2JR's circuit for a 3·5 Mc/s. variable frequency crystal oscillator is shown in Fig. 1. The crystal should preferably be an "X" cut type, as with "AT" cut crystals oscillation on spurious frequencies may occur. The tuned circuit L1, C1 should normally tune to a higher frequency than that of the crystal, gradually approaching resonance as the capacity is increased. The frequency varies when this capacity is changed. Care must be taken in the mechanical construction and fixing of L1, C1, although it is stated that the stability of the variable frequency crystal oscillator is better than 50 times that of a corresponding self-excited circuit for small changes in the value of the tuning circuit constants. The circuit requires the use of a tetrode or pentode valve and the oscillator should not be heavily loaded.

Television from France

Experimental 819-line television transmissions are radiated from Eiffel Tower on the following frequencies: video 213·25 Mc/s.; sound 202·1 Mc/s. The power of the video transmissions is expected to be raised to 3 kW. shortly.—*La Télévision Francaise.*

NATIONAL CONVENTION–MANCHESTER

Record Attendance at Belle Vue

THE first post-war National Convention of the Society—held in Manchester during the period from the 21st to the 23rd October, 1949—attracted the largest gathering of radio amateurs ever seen in the United Kingdom. The peak attendance was recorded at Belle Vue on the Sunday when 576 sat down to lunch.

Exhibition at Corn Exchange

For the first time in the history of the Society an Amateur Radio Exhibition was run in conjunction with Convention. Staged at the Corn Exchange —a building admirably suited for the purpose— the exhibition was opened at 3 p.m. on Friday, October 21, by the Lord Mayor of Manchester (Alderman Robert Moss, J.P.) who had the support of the Lady Mayoress.

THE LORD MAYOR OF MANCHESTER OPENING THE EXHIBITION.
Seated left to right: G6OM, 6CL, 5VM and 2WS.

After welcoming the Lord Mayor, the President (Mr. V. M. Desmond) referred to the support given to the exhibition by the Radio Industry, the Press, the Royal Navy, and the Royal Air Force, and to the co-operation of the Postmaster-General in granting permission for a transmitting station to be operated from the Exhibition Hall using the special call sign allocated to the Society—GB3RS/A.

The Lord Mayor, in a much appreciated speech, spoke of the inventiveness of radio amateurs who, he said, possessed infinite wisdom, patience and vision, and who never despaired in the face of disappointment. He offered congratulations to the Society for its enterprise in organising the Exhibition, and expressed his personal pleasure that the City of Manchester had been selected for the first post-war Convention of the Society.

The President-Elect (Mr. W. A. Scarr, M.A.) cordially thanked the Lord Mayor for his kindness in attending to open the Exhibition, and for giving Convention such a splendid start.

During their subsequent tour of the stands the Lord Mayor and Lady Mayoress accepted with enthusiasm an invitation to inspect GB3RS/A, which they found in full operation.

Throughout the period of the Exhibition the R.S.G.B. stand was manned by a team of enthusiastic members who lost no opportunity in " selling " Amateur Radio to interested non-members.

The Exhibition Manager was Mr. H. C. Daynes, G5YD, who had the valued assistance of Mr. Archie Brown, G2WQ, in the compilation and editing of the catalogue. A more detailed account of the Exhibition appears elsewhere in this issue.

Aerials Lecture

Although provision had been made for Mr. F. Charman, B.E.M., G6CJ, to deliver his aerials lecture on both the Friday evening and the Saturday afternoon at the College of Technology, the demand remained unsatisfied. Consequently a third " performance " was arranged for the Sunday morning at the Grand Hotel. Although every effort was made to give publicity to this extra lecture, a number of visitors, unfortunately, did not hear about it until after it had taken place. Even so more than 300 members listened to the lecture during the week-end—a remarkable tribute to the ingenuity of a lecturer who has the knack of finding something fresh to describe every time.

Social Occasions and Visits

A party of 40, including the President, the President-Elect, the Hon. Editor and the General Secretary visited the Palace Theatre on the Friday evening to see the musical play " Bless the Bride." On the same evening a number of members visited the Kemsley Press.

On the Saturday afternoon two groups visited the Manchester Ship Canal and the North Regional Station of the B.B.C. at Moorside Edge. A further group witnessed an excellent demonstration at the Central Fire Station, arranged by the Manchester Fire Chief, Commander Hoare.

Luncheon at Belle Vue

At midday on the Saturday, about 150 members and friends journeyed to Belle Vue for an informal luncheon served in the Tudor Room. Unfortunately the weather was not sufficiently inviting to permit an extensive tour of the grounds, although it was rumoured that the President and his party found time to sample the " Giant Dipper " and that another member of the Council had tried to solve the Mystery of Pandora's Box !

Film Show

The lecture theatre at the College of Technology was crowded during the Saturday afternoon when the General Secretary presented a number of Society films, some of which were taken as far back as 1937.

Ian Auchterlonie, G6OM, Chairman of the Convention Working Committee, addresses the Convention Business Meeting. Also in the picture from left to right, G4KD, 6CJ, 6CL, 5VM, Miss Gadsden, 2WS, 3AGM, 6LJ, 6JJ and 2MI. G2UJ was concealed behind G6OM.

The films disclosed that even in pre-war days certain N.F.D. stations employed masses of elaborate equipment, although no beams were in evidence! They also showed-up, to a marked degree, the difference in the appearance of pre-war, compared with post-war stations. In 1937–8 the "bread-board" layout was in general use, whilst aerial systems were of the simple Hertz or Zeppelin type.

A buffet tea followed the film show.

assistance. Mr. Desmond concluded by saying: "May the bright light of Amateur Radio continue to illuminate this troubled world, and may we, as radio amateurs, make the fullest possible contribution towards world peace."

Mr. Arthur Milne, G2MI, cordially welcomed all visitors and expressed the hope that those from overseas would take back with them happy memories of their visit to the Manchester Convention—which

A group taken at the business meeting in the Pagoda Room, Belle Vue. *Photo, E. W. Taylor, G2ALN.*

Convention

On the Sunday, coach parties, which had left distant towns and villages early in the morning, made the Exhibition their first port of call. Here they were joined by other groups that had arrived by rail and car. At midday the Corn Exchange was well filled but a few moments later it became almost deserted as the parties moved off to Belle Vue. Inclement weather again prevailed but once inside the spacious buildings which house the banqueting rooms, the rain was quickly forgotten.

The very large attendance made it necessary to use both the Tudor and York Rooms for the luncheon. The smaller of the two parties was kept in close touch with the proceedings in the main dining room through the medium of a P.A. equipment. With the President in the Chair and the General Secretary acting as Toastmaster, the luncheon proceeded smoothly—a tribute to the efficient manner in which the Belle Vue authorities cater for large parties of visitors.

The informal toasts—of which there were many—were responded to with enthusiasm, after which the more formal toasts were offered and acknowledged.

In proposing a toast to the Society, Brigadier B. D. Kapur, VU2HM, Chief Signals Officer, Southern Command, Indian Army, thanked the Council for the assistance it had rendered to the Amateur Radio Club of India, of which Club he is the Patron. Brig. Kapur described Amateur Radio as "The Brotherhood of the Air" and referred to the great contribution made by the R.S.G.B. during the recent war.

The President, after thanking Brig. Kapur for his kindly references to the Society, expressed his personal pleasure that it had been found possible to hold the first post-war Convention during his term of office. He paid a warm tribute to the members who had served on the Convention Working Committee, and thanked them for their valuable

he described as "a milestone in the long history of British Amateur Radio." He passed on greetings from ZS6BT, VK2AGW, VK2NO and others and read messages of good wishes from OH2NM, ZD9AA, GM2HB and the East London District of the Society.

The reply came from Lt. W. P. Mitchell, DL4DX, who gave first-hand news of the formation of an Overseas Amateur Radio Association (open to all U.S. amateurs serving overseas), the purpose of which will be to promote international goodwill. Lt. Mitchell who is serving in the American Zone of Germany said he would be glad to accommodate 10,000 amateurs at his home—provided they arrive three at a time!

Mr. W. N. Craig, B.Sc. G6JJ, in proposing a toast to The Ladies suggested that without their support and interest Amateur Radio would become a dreary hobby. He thanked the wives of the members of the Committee who, he suggested, had foregone many family pleasures recently in order that their menfolk could concentrate on plans for Convention. In a few carefully chosen words, Mrs. Bolland, wife of G5DW, neatly thanked Mr. Craig for his remarks.

In proposing a toast to the Convention Working Committee the Secretary spoke of the great responsibilties which its members had undertaken, and of the successes that had crowned their efforts. The Chairman of the Committee, Mr. Ian Auchterlonie, G6OM, broke all records for short speeches when he replied in seven words—"If you're satisfied, we are. Thank you."

During the lunch a draw for prizes donated by manufacturers and others took place. The chief prize was an Avometer presented by the *Automatic Coil Winder and Equipment Co.*, and this was won by G2ZF.

Arrangements had been made for a group photograph to be taken out of doors immediately after the luncheon, but a heavy rainstorm caused this part of the programme to be abandoned.

Business Meeting

The business meeting, held in the Pagoda Room with the President in the Chair, opened with an address by the General Secretary on a wide variety of topics of current interest. He referred in particular to the scheme of representation, the Amateur Radio aspects of the recently-concluded Region I Conference in Geneva, television interference problems, BULLETIN contributions and the effects of the Town and Country Planning Act (1947) and local byelaws on the erection of large lattice-type masts. He also announced that the G.P.O. had agreed to the use of higher power on all V.H.F. bands except 420–460 Mc/s.

Mr. Milne then spoke on QSL matters, and Mr. Charman on the work of the Contests Committee.

The meeting was afterwards thrown open for discussion when a number of questions were dealt with by the various speakers. The company then divided into two parties—one for high tea, the other for plain tea.

The Draw

The eagerly awaited draw for prizes took place during tea, the 20 lucky winners receiving the congratulations of their friends. The principle winners were G2AMV (*Denco* DCR19) and G2IN (*Commander*). (A complete list of prize winners is in the hands of the Hon. Secretary, Convention Working Committee—Mr. H. Cox, G3BUI.)

With the drawing of the last lucky number Convention came to an end but for several hours longer groups of members lingered at Belle Vue—whilst others returned to the Corn Exchange for a last look round.

For all who were lucky enough to be present, the Manchester Convention—and the Exhibition—will remain a most happy memory.

Roll on 1950 !

THE MANCHESTER AMATEUR RADIO EXHIBITION

THE Manchester Exhibition, held at the Corn Exchange, from Friday, October 21, to Sunday, October 23, 1949, and officially opened during the Friday afternoon by the Lord Mayor of Manchester (Alderman Robert Moss, J.P.), was without doubt the most comprehensive exhibition of its kind ever seen in the provinces. During the three days it remained open the exhibition was visited by several thousand amateurs and enthusiasts. Support from the general public, though satisfactory, would undoubtedly have been even greater if the notorious Manchester weather had not also seized the opportunity of exhibiting its full range of vagaries !

The stands, which were arranged to take full advantage of the spaciousness of the building, could be divided into two main categories : trade exhibits representing some 14 of the best known firms catering for the amateur market, and displays arranged by Societies, Service Authorities and other interested organisations.

THE LORD MAYOR AND LADY MAYORESS OF MANCHESTER DURING THEIR VISIT TO GB3RS/A.
Photo, courtesy, Kemsley Newspapers Ltd.

R.S.G.B. Stands

Great interest was shown in the operation of GB3RS/A which during the exhibition made more than 200 contacts, both 'phone and C.W., on the 7 and 14 Mc/s. bands. The transmitter, built by members of the Liverpool and District Short Wave Club and the Merseyside Radio Society, consisted of two EF50's as a cathode coupled Colpitts V.F.O., a VT501 doubler stage followed by an 807 buffer/doubler stage with an anode-modulated 805 P.A. running at 150 watts input. On the audio side, the output from a two-stage pre-amplifier (6J7—6J5) was fed into the main speech amplifier which employed a 6SN7 double triode, two 6V6's and a pair of zero-biased 807's. Two dipole aerials were used, one cut for the 7 Mc/s. band and the other for 14 Mc/s. The receiver was a " Commander " specially loaned for the occasion by *Radiovision (Leicester) Ltd.* Authorisation had been received from the P.M.G. for the following amateurs to operate the station : G2ALN, 2AMV, 2ATU, 2GA, 2HAP, 2HW, 3DVB, 3DVU, 3FBH, 3VA, 4FM, 6CL, 6KS and 8BM.

Information on Society matters and the "Amateur Radio " series of publications were available at a second R.S.G.B. stand on which a number of interesting items of equipment, constructed mostly by local members, were also displayed. These included a low-power portable transmitter covering 1·8 and 3·5 Mc/s. (G8NL), a 7-valve amateur-bands midget receiver (BRS9678), a Franklin V.F.O. with built-in crystal calibrator (G2WQ), a V.F.O. exciter (G3CNN), a semi-automatic key and a compact—8½ in.×6 in. —25-watt C.W./'phone transmitter (G2HW). G2WS showed his 420 Mc/s. converter for use with broadband 12 Mc/s. I.F. This item will also be displayed at the London Amateur Radio Exhibition.

Model Control

The Radio Controlled Models Society's demonstrations proved a popular feature of the exhibition. Radio control of a 3 ft. " Land Rover," or jeep, constructed by members of the Manchester Group, included complete positional steering and the ability to switch the engine forward, off and in reverse. The 27 Mc/s. transmitter is modulated by mechanically produced pulses and the receiver comprises a two valve super-regen. circuit operating an anode relay

which in turn controls the self-balancing servo mechanism. This equipment has been tested at a range of 1½ miles. The London Group showed a model " DUKW " amphibious vehicle controlled by five audio frequency modulation channels on a 465 Mc/s. carrier. Simultaneous control over three functions is possible : two of the channels are used for steering, two for engine control and the fifth for sounding the horn ! The response speed of the audio frequency filters permits up to 30 impulses per second to be passed to each of the five relays in the receiver. A 24 V. 7 A.H. accumulator provides power for one hour's continuous running. The transmitter consists of a pair of EC53's as a push-pull self-excited oscillator with tuned anode, tuned cathode, parallel lines giving an R.F. output of approximately ¾ watt : sufficient for a range of some 200 yards with the 955 super-regen. receiver fitted in the " DUKW."

Harry Whalley, G2HW, Chief Operator at GB3RS/A.
Photo, courtesy, Kemsley Newspapers Ltd.

Both the Senior and Junior Services were represented in the exhibition. Apparatus from the local Royal Naval Volunteer (Wireless) Reserve Training Centre was displayed together with typical transmitting and receiving equipment as issued on loan to recruits for use in their own homes. The R.A.F. provided an interesting display of standard airborne and ground station equipment and an emergency dinghy transmitter.

Kemsley Newspapers Ltd. featured the use of radio as an aid to modern news-gathering. Mobile and " walkie-talkie " sets operating in the region of 78 Mc/s. were shown. While many notable scoops have already been made possible by the use of such equipment, there would still appear to be a need for a lower frequency allocation for the Press, suitable for longer distances and less affected by local terrain.

Trade Exhibits

It is not intended to comment at length on the trade stands, many of which were similar to those described in the London Exhibition catalogue enclosed with this issue of the BULLETIN. The range and variety of excellently designed equipment and components now available to amateurs and enthusiasts in this country was vividly demonstrated by the 14 firms who supported the exhibition. *Panda Radio Co.* deserve mention for their enterprise in erecting, inside the building, the top half of one of their 32 ft. towers complete with dual 14 and 28 Mc/s. 3-element beams, remote control mechanism and direction indicator.

Exhibits included :—

Aerialite Ltd. Aerial equipment, R.F. cables, interference suppressors for the amateur and television enthusiast.

Automatic Coil Winder & Electrical Equipment Co. Ltd. Items from the range of Avo measuring and test equipment.

Denco (Clacton) Ltd. The DCR19 communications receiver, a television kit and the full range of Denco components.

Labgear Ltd. Components especially designed for amateur transmission including a new 144 Mc/s. rotary beam aerial array.

Panda Radio Co. Beam aerials, welded towers and control mechanism.

E. J. Philpott's Metalworks Ltd. Chassis, cabinets and other metal work made to individual specification.

Plastics (Manchester) Ltd. Plastic materials suitable for many applications in the construction of amateur equipment.

Pye Telecommunications Ltd. V.H.F. mobile equipment for " Business Radio " and other services; the " Dolphin " M.F. marine radio telephone for yachts and small craft.

Radiovision (Leicester) Ltd. The " Commander " double conversion communications receiver covering 1·7 to 31 Mc/s.

Salford Electrical Instruments Ltd. A wide range of piezo quartz crystals, rectifiers and miniature cathode ray oscilloscopes.

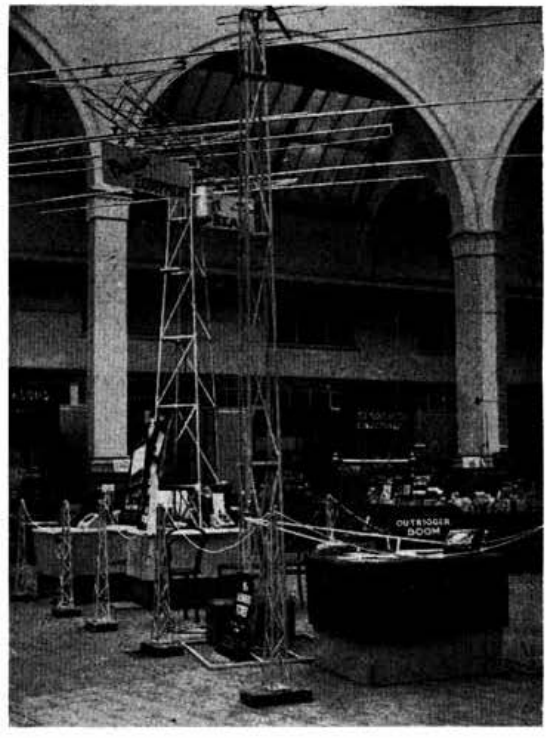
Stratton & Co. Ltd. The 680 and the new 750 double-conversion superhet, together with the full range of Eddystone components.

Taylor Electrical Instruments Ltd. Electrical measuring equipment of all types from the " Taylor " and " Windsor " ranges.

Woden Transformer Co. Ltd. Transformers and chokes suitable for most amateur requirements.

W.B. Radio (G4PF). Built to specification transmitting equipment and a wide selection of components manufactured by well-known firms.

The Exhibition Manager (Mr. H. C. Daynes, G5YD), the Working Committee and the many local members



The Panda Company Exhibit.

who gave so freely of their time and skill, are to be congratulated upon making the show such a great success. Much hard work and long hours must have been necessary both before and during the Exhibition by those who volunteered as Stewards, for Stand Duty, or for the myriad responsibilities attached to the smooth running of this ambitious venture.

Midland Amateur Radio Society

THE Annual Dinner of the Midland Amateur Radio Society held at the Imperial Hotel, Birmingham on October 15 last, was supported by 97 members and friends. The chair was taken by the newly-elected President, Mr. Garnett Lapworth, G6DL, who had the support of Mr. V. M. Desmond, G5VM, and Mr. John Clarricoats, G6CL (President and Secretary respectively of the R.S.G.B.), both of whom are Vice-Presidents.

Prior to the dinner Mrs. C. H. Young, wife of the retiring President, presented a beautiful bouquet of autumn blooms to Mrs. Lapworth.

During the after proceedings G6CL proposed a toast to M.A.R.S. and the response came from Vice-President George Brown, G5BJ. Mr. Lapworth toasted the R.S.G.B. and G5VM responded. G2AK proposed a toast to the Visitors to which Mr. L. Gardner, G5GR (Chairman of Coventry Amateur Radio Society) and Mr. Ken Brecknell, ZS6LF responded. Past President Eric Wilson, G2FDR, extended a welcome to the ladies, on whose behalf Mrs. Arnold Rhodes made a happy response.

After the speeches the company were entertained by skilled illusionist Frank Frazer from Aberdeen.

The organisation of the function was in the able hands of the Dinner Committee and hardworking Secretary, Arnold Rhodes, BRS16579.

South Eastern Regional Meeting

FIFTY-FOUR members were present at the Region 8 meeting held after lunch at the Albemarle Hotel, Brighton, on Sunday, October 9, 1949.

The Executive Vice-President (Mr. W. A. Scarr, M.A., G2WS), and two Council members (Mr. W. H. Allen, M.B.E., G2UJ, and Mr. A. P. G. Amos, G3AGM), with the General Secretary (Mr. John Clarricoats, G6CL) and Miss May Gadsden represented Headquarters.

Mr. Scarr took the chair at the business meeting, which opened with an address given by the General Secretary. The Council members present also spoke. The discussion which followed continued after an adjournment for tea.

G5LR.

The assembled company at the Midland Amateur Radio Society Annual Dinner held in Birmingham on October 15, 1949

Convention Photographs

MR. E. W. TAYLOR, G2ALN, 76 Sidney Road, Blackley, Manchester, will be glad to supply members with copies of the photographs taken by him during Convention. Prices are as follows :— Large group 4s. 6d. (10 in. × 6 in.). All other groups 3s. 6d. (8½ in. × 6½ in.).

In the Public Interest

A 4-page leaflet *Courtesy extends further than the Road* has recently been prepared by the *Television Society* in collaboration with the Radio Industries Council. Members who are able to distribute these leaflets to the motoring public will be rendering a valuable service both to television and to Amateur Radio. Copies may be obtained from the Hon. Secretary, 68 Compton Road, Winchmore Hill, London, N.21.

M.A.R.S. ANNUAL DINNER.
The General Secretary of the R.S.G.B. proposing a toast to the Midland Amateur Radio Society at their annual dinner. The President of the R.S.G.B. (Mr. V. M. Desmond, G5VM) and the President of M.A.R.S. (Mr. G. Lapworth, G6DL) and Mrs. Lapworth are to the right and the Region 3 Representative (Mr. D. A. G. Edwards, G3DO) to the left of the speaker.

"THE PRESIDENT'S TROPHIES" TRANSMITTERS

BY F. PIKE (G3ENS)*

Although the thoughts of 420 Mc/s. enthusiasts are turning more and more towards stabilised transmitters, this description by G3ENS of the simple equipment with which the President's Trophies were won by G3APY and himself is of more than historical interest. There is still a demand for apparatus of this type, not only for communication purposes but also for model control experiments (with a maximum input of 5 watts) on the 464–465 Mc/s. frequency allocation.

ON August 12, 1949, G3APY and G3ENS made contact on 420 Mc/s. over a distance exceeding 25 miles under the conditions specified for the President's Trophies, which had remained unclaimed since the band was released on October 1, 1948. The transmitters employed at both stations were identical except for a slight frequency variation and each was home-constructed.

These transmitters were designed to obtain more R.F. power than was available from the popular ex-Government equipment such as the R.F. Unit type 105 which forms the basis of many of the present-day 420 Mc/s. amateur stations. Two CV82 valves were used in the push-pull grounded-grid circuit shown in Fig. 1 as a self-excited oscillator with anode modulation. As far as possible the entire transmitter was built of brass and was totally enclosed to prevent direct radiation. Many of the ideas incorporated, as well as the grid and disk capacitors, were derived from the R.F. Unit type 105.

Circuit Details

The transmitter box was fabricated from $\frac{1}{4}$ in. brass plate except for the top and bottom sections which were of 14 S.W.G. brass sheet. The inside dimensions of the box were 6 in. × 6 in. × 3 in. An idea of the general construction and layout can be obtained from Fig. 2. The anode line, which determines the frequency of oscillation, consists of $\frac{3}{8}$ in. copper tubing shaped in the form of three sides of a square, the actual dimensions being $2\frac{1}{2}$ in. × $2\frac{1}{2}$ in. × $2\frac{1}{2}$ in. Output is obtained from a 6 in. length of 14 S.W.G. tinned copper wire loosely coupled to the anode line. The cathode coils consist of 3 turns of 22 S.W.G. enamelled copper wire wound self-supporting with a diameter of $\frac{1}{4}$ in.

The normal input of the transmitter is in the region of 20 watts at which power the valves run coolly. The 1000 c/s. tone modulator comprises a 6SN7 double-triode valve driving a pair of KT61s. In order to permit either portable or fixed working the power is derived from an ex-Government rotary transformer as used in the No. 19 set. This provides 450 volts for the transmitter and 250 volts for the modulator.

* *60a Church Gate, Loughborough, Leics.*

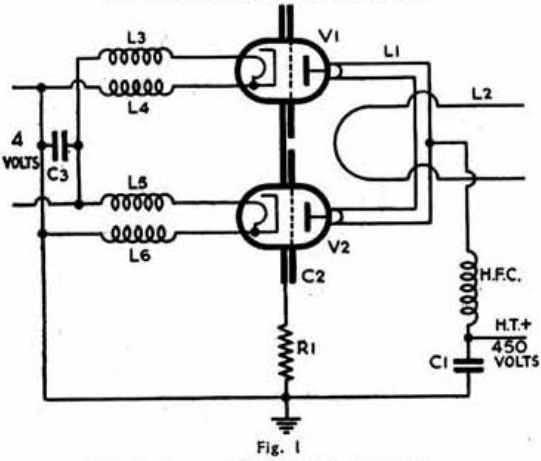


Fig. 1

Circuit Diagram of the 420 Mc/s. Transmitter.

C1	Grid Capacitor
C2, 3	Disc Capacitors
R1	1,000 ohms $\frac{1}{2}$ watt
L1	Anode Coil $2\frac{1}{2}$ in. × $2\frac{1}{2}$ in. × $2\frac{1}{2}$ in. of $\frac{3}{8}$ in. copper tube
L2	Output coil 6 in. No. 14 S.W.G. tinned copper wire.
L3, 4, 5, 6	Cathode coils—3 turns $\frac{1}{4}$ in. former No. 22 S.W.G., E.C.W.
H.F.C.	6 turns $\frac{1}{4}$ in. former No. 22 S.W.G., E.C.W.
V1, 2	S.T.C., 3A/147K (CV82) Valves

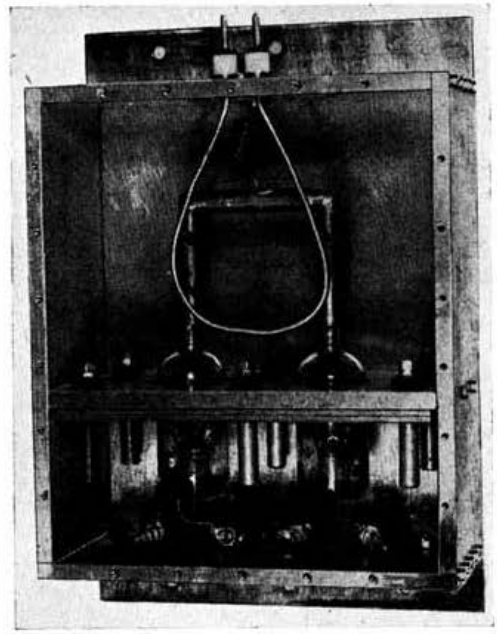


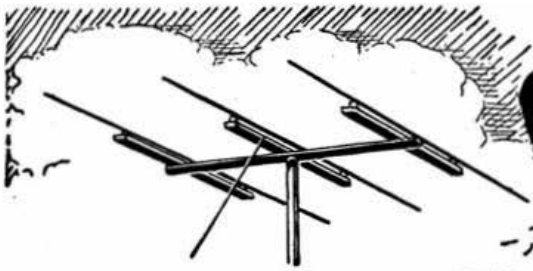
Fig. 2.

General view of the Transmitter.

Early Tests

Due to the fact that the location at G3ENS was considered poor, especially with regard to U.H.F. activities, portable work was considered essential in the beginning. Tests carried out with G3APY early in 1949 from a site 750 ft. A.S.L. resulted in two-way S9 reports being exchanged but no signals could be heard at either station when the transmitter was operated from the fixed location. Work was therefore concentrated on improving receiver sensitivity. After modifications had been made by G3APY to his P58 receiver, he was able to receive G3ENS at S7 but

(*Continued on Page* 152).



AROUND THE V.H.F.'s

G6UH hears FA8IH on 144 Mc/s.
First GM/GW QSO on 420 Mc/s.

THE main news of general interest to V.H.F. workers during the past month was the announcement that an input of up to 150 watts may now be used on all V.H.F. bands except 420 Mc/s. This facility, arrived at after prolonged negotiations between the Society and the Post Office Engineering Department was formally announced in *The London Gazette* on October 18, but prior to that date Headquarters advised all Regional and County Representatives. It is unfortunate that the facility cannot be extended to the 420 Mc/s. band, but, as most readers are aware, this band is shared with aircraft radio altimeters. In the view of the G.P.O., this important service would be adversely affected by powerful amateur signals on closely adjacent frequencies.

By

W. H. Allen,* G2UJ

Two Metre Band Plan

Our observations in September in regard to band planning and to other aspects of two metre work aroused quite a lot of interest and resulted in a number of much appreciated letters and 'phone calls as well as some comments over the air. While obviously many people must have found themselves in disagreement on one or more points, only one took the trouble to write and tell us; that letter—from G2IQ (Sheffield)—left us in no doubt whatever that the writer took an extremely dim view of what we had to say!

Scientific Observations—Tropospherical Group

It is understood from the Group Manager, G2KG (Chelmsford), that it is hoped to submit an interim report on the Group's findings to the Society by Christmas, and all members are requested to forward their report forms suitably completed to the end of November.

The set schedules, upon which the majority of the data is compiled, continue to operate satisfactorily, among the most consistent of which is that between G5BD (Mablethorpe) and G5WP (Woking). This sked., inadvertently omitted from our mention last month, is now in its fourth month and continues to show excellent results over the 150 mile path. 5BD has now a fixed beam trained on Woking for the purpose. G2CPL (Lowestoft) and G2NH (New Malden), 115 miles apart, are maintaining regular contact despite worsening conditions.

G6UH Hears FA8IH on Two Metres

For the first time, we believe, a V.H.F. World's Record is held by a station in this country. This outstanding feat was accomplished by G6UH (Hayes, Middx.) on October 17 when he received signals on 144·10 Mc/s. from FA8IH in Algiers over a distance of approximately 1,030 miles, thus just beating the 1,000 mile American cross-band achievement recorded in a recent issue of *QST*.

FA8IH was first heard at 1855 G.M.T. calling CQ, and then between 1859 and 1904 working an F9 station. Next day G6UH managed to contact the North African station on 28 Mc/s., and the V.H.F. reception was confirmed, FA8IH having worked F9BW at the time mentioned. The signals at 6UH were RST 569, and rotation of the beam had little effect upon their strength. The receiver in use was an RF27 unit modified according to G2FMF's article in the May, 1949, issue of the BULLETIN with the addition of a 6J6 R.F. stage, the main receiver being a modified R.1132A.

We should be most interested to learn whether anyone else encountered exceptional DX conditions on the band at about the same time. It is understood that FA8IH is regularly active on the frequency mentioned above from 1800 to 2200 G.M.T., and we should not be at all surprised if two-way working is effected between North Africa and a station in this country in the very near future. A report that a Finnish station has been heard in Africa on two metres is so far unconfirmed.

Other Two Metre News

G5MR (Hythe, Kent, 145·15 Mc/s.) has succeeded in contacting GW2ADZ (Llanymynech) after many attempts. 5MR's signals were S6/7 and the Welsh station S5 with severe fading in both directions. The distance is 216 miles. G5MR recently worked four stations in the Paris area; F3DC (144·5 Mc/s.), 8BY (144·8), 8LO (145·33) and 8OL (145·0). The date was not mentioned but G4DC (New Cross, London, S.E.), using an SCR522, a 6J6 plus 6J6 converter and a stacked array of three 4-element beams worked F8OL and heard F9MX on October 6. The following night was also favourable for contacts between London and Paris, and G2CIW (Brentwood), with a 16-element beam, added F8LO, 8OL and 9MX to his bag, and in addition heard another F9 on 'phone.

G2KG (Chelmsford) heard F8LO at the extreme L.F. end of the band at S9 plus on three consecutive nights, and F8OL at S4/5. A contact with PA0PN yielded a report of S7 peaking to S9—the Dutch station remaining at a consistent S9 plus—and the news that DL3FM and DL3IT are on the band and that G5BY has been heard at RST 569 in central Holland.

Strong signals from Kent mean a lack of G-DX from other directions to G2XS (Kings Lynn), and he would like to have some comments on this fact. He employs 80 watts input on 144·696 Mc/s., and favours an 8-element rotary stack with all elements driven and no reflectors.

GM/GW Contact on 70 cm.

Operating on Carnedd Ugain, half a mile north of Snowdon, at a height of 3,493 ft. a.s.l., GW6DP/P established two-way contact with GM2JT/P on Criffell (1,866 ft.) in south Dumfriesshire on October 8 over a distance of 130 miles. The gear employed was essentially similar to that described last month,

* *W. H. Allen, M.B.E., 32 Earls Road, Tunbridge Wells, Kent.*

but owing to a last minute hitch GW6DP/P had to operate single handed, with the result that use of a hand H.T. generator was impracticable and the input was reduced to about 3 watts from miniature dry cells.

The signal path lay for some 110 miles over the sea, and the resulting low attenuation was doubtless responsible for the high peak signal strengths despite the low power used—rather less than ·25 watts R.F. Signals were subject to a slow periodic variation from S7/8 to zero throughout the period of the tests (1100 to 1535 G.M.T.) with similar maxima and minima at each end, and which was probably due to variations in refraction or possibly ducting. Weather conditions were excellent on Snowdon, but on Criffell fairly thick mist was experienced throughout the period. The steps taken to prevent condensation troubles, however, proved satisfactory. No other signals were heard by either station.

We feel that the efforts of Messrs. Jones and Palin during the past few months, both in radio and in a physical sense, deserve high praise, and we look forward to reporting further high-level tests next year when improved apparatus will possibly be in use.

South London V.H.F. Group

At a meeting of the above group on October 16 many of the practical aspects of the 420 Mc/s. band came under discussion, and the suggestion was made that a narrow portion of the band be set apart for experiments with crystal controlled apparatus. To facilitate searching and the mechanical construction of transmitters and receivers it was felt that this portion of the band should not be more than two or three megacycles wide, and preferably be in harmonic relationship with a part of the 144 Mc/s. band to enable existing transmitters in that band to be used as drivers.

Experimental work with the group's C.C. transmitter, which is now nearing completion, has suggested that doubling with the aid of an earthed grid triode is preferable to attempts at tripling where a driven P.A. is to be employed, but it was pointed out that power triplers represented a fairly straightforward method of obtaining a 70 cm. stabilised signal. The comments of interested members are invited on the establishment of a C.C. band centred on 436 Mc/s.

On the question of the employment of unstabilised transmitters the meeting decided that although crystal control should be the ultimate aim, in order fully to exploit the possibilities of the band, simple apparatus still had its uses in providing newcomers with the opportunity of getting to know its peculiarities and in promoting more general activity.

The group's activity periods remain as before; on Wednesdays from 2000 to 2200 G.M.T., and on Sunday mornings from 1100 to 1300 G.M.T. For the latter period it was decided that all stations should congregate at the low frequency end of the 1·7 Mc/s. band for the first 15 minutes for arrangements concerning schedules, etc., before going over to 70 cm. at 1115 G.M.T. This will be effective from Sunday, November 20. Skeds. with other groups would be welcomed.

In addition to the above, G2FKZ (Dulwich) and G3APY (Kirby-in-Ashfield) have arranged a sked. on crystal controlled C.W. every Thursday evening from 2030 to 2045 G.M.T., the frequencies being 436·0 and 435·48 Mc/s., respectively, and stations *en route* are requested to co-operate if possible.

Police Radio

We understand from *Messrs. Pye, Ltd.*, that their control station receiver, designed for Police Radio work, employs a conventional diode second detector combined with a muting or "squelch" circuit, and is not superregenerative as described under the heading "Commercial V.H.F.'s" on this page in September. The error in description occurred owing to the fact that the muting threshold control is marked "quench" on this receiver, and we apologise for any misunderstanding which may have been caused.

Tailpiece

Overheard on two metres. "You know, old boy, conditions are very queer this evening. I can hear several stations which I can't raise, and that's the exact opposite to normal."

* * *

Reports for inclusion in the December issue should reach us not later than November 22.

"The President's Trophies" Transmitters—*Continued from page 150.*

two-way communication could still not be established. During these and the later tests, a communicating link was maintained on 145 Mc/s.

As it was now apparent that the transmitter at G3ENS and the modified receiver at G3APY were satisfactory for the purpose, duplicates were constructed. With this new equipment contact was established during the first trial at 2000 B.S.T. on August 11 with signal strengths of S6 each way. The aerials in use were a 16-element broadside array (for transmission) and a 6-element Yagi (for reception) at G3ENS and a 5-element Yagi at G3APY. It is interesting to note that during this first contact the aerials at G3ENS were mounted on a table inside the house.

Next day (August 12) it was decided to make an attempt to qualify for the President's Trophies. The Yagi at G3ENS was affixed to the top of a 10 ft. pole and the necessary witnesses were gathered at the two stations. As all members will know, this attempt met with complete success. Signals were S8 both ways on I.C.W. (A2); later G3APY changed to telephony which was received at R5 S7.

Since that date contact has been established many times with little variation in signal strengths. It has been observed that nearby aircraft cause considerable signal flutter but this effect is usually of short duration. Frequency drift of the transmitters is approximately 3 Mc/s. but the frequency usually settles within the space of a normal short calling period. There is little doubt that for serious long-distance work, crystal-controlled transmitters and sensitive receivers are essential. However, these simple tests have provided much encouragement to the participants, particularly as, at first, the location appeared to be so poor. By their success, for which much of the credit is due to the enthusiasm and energy of G3APY, yet another milestone along the path of amateur U.H.F. development has been passed.

One Minute Quiz

Can you say which is the correct answer?

1. *The RST signal reporting code was devised by:* (*a*) *W1AW*; (*b*) *G6WY*; (*c*) *W2BSR.*
2. *The first distress call was transmitted from a ship in:* (*a*) 1899; (*b*) 1905; (*c*) 1912.
3. *Speech was first transmitted across the Atlantic by a commercial station in:* (*a*) 1911; (*b*) 1915; (*c*) 1924.
4. *The number of American amateurs is approximately:* (*a*) 40,000; (*b*) 80,000; (*c*) 125,000.
5. *G2OD made the first England–Australia amateur contact in:* (*a*) 1920; (*b*) 1922; (*c*) 1924.

(Answers on page 159)

ANNUAL REPORT OF THE COUNCIL

THE Council takes pleasure in presenting a Report covering the activities of the Society from October 1, 1948, to June 30, 1949, which period corresponds to the current accounting period. Future Annual Reports will cover a period of 12 months ending on June 30 each year.

The Society's Journal

For the first time since 1940 a slight improvement in the paper position can be recorded. From October, 1948, to June, 1949, the nine issues averaged 28 pages compared with an average of 20 pages per issue for the corresponding period in the previous year. It is anticipated that an even more satisfactory improvement will be reported next year.

Whilst the standard of technical contributions has been well maintained, the Council considers it necessary to emphasise that, with a membership approaching 14,000 whose talents and abilities vary widely, it is difficult to cater for all interests within the compass of a single issue. On the assumption that the paper position will continue to improve it is planned to devote more space than hitherto to subjects of special interest to the non-transmitting member.

Enhanced paper supplies have enabled the Society to allocate more space to advertising, a facility which has been appreciated by both members and advertisers.

The Council records its best thanks to all who contributed to Volume 24 of the BULLETIN, as well as to those who booked advertising space.

As a direct result of the improvement in the paper position the Council decided during the year to dispense with the *Proceedings of the R.S.G.B.* This venture had proved costly from its inception due to the reluctance of advertisers to book space. Each 16 page issue cost £175 to print and very little revenue was obtained from advertising. The *Proceedings*—introduced as a temporary expedient when paper supplies for established publications could not be increased—were used as a vehicle for the publication of papers read to the membership at Meetings of the Society held at the Institution of Electrical Engineers, London. It is now planned to revert to the pre-war practice of publishing in the BULLETIN all papers of general interest.

Technical Publications

One new title in the Society's "Amateur Radio" series—*Transmitter Interference*—appeared in November, 1948, whilst *Service Valve Equivalents* was reprinted for the third time. Work was started on two new books, *Receivers* and *Simple Transmitting Equipment*.

Earlier booklets in the series sold steadily but sales abroad were disappointingly small.

Plans are on foot to produce a third edition of the *Amateur Radio Handbook*, but some time must elapse before this project reaches fruition.

Licence Matters

No important development in connection with licences occurred during the period under review.

Prior to the commencement of the Region I Conference in Geneva the Society's Representatives received assurances from the G.P.O. that every effort would be made by the U.K. delegation to ensure that British Isles amateurs are permitted, after the coming into effect of the Region I Table of Frequencies, to continue to occupy the 1·8 Mc/s. and 3·5 Mc/s. bands on a shared basis. The G.P.O. warned the Society, however, that both bands would probably come under severe attack from certain European nations who desire to use them for Services peculiar to their special needs.

Representatives of the Council have discussed with the G.P.O. such questions as the opening-up of a small band of frequencies around 72 Mc/s., the raising of the present maximum input power limit on the V.H.F. bands to a higher figure, and the granting of facilities for qualified personnel to operate amateur transmitting equipment aboard ship. No decision on these matters has yet been reached due to the absence abroad (at the Geneva Conference) of certain Executive Heads of the Radio Branch of the G.P.O. (*An announcement appears in the current issue regarding the use of higher power on the V.H.F. bands.*—ED.).

Up to the end of June, 1949, the G.P.O. had issued 7,145 licences, an increase of 688 since October, 1948.

Radio Amateurs' Examination

The Council regrets that the City & Guilds of London Institute is still unable to arrange for the holding of two examinations each year. No less than 885 candidates sat for the 1949 examination and of this number 628 passed. The comparative figures for a year earlier were 688 and 519. Candidates who fail the examination must now wait for a further 12 months before sitting again. This delay, which unsuccessful candidates regard as irksome and irritating, may lead to an outbreak of "piracy"; there is, in fact, already some evidence that unlicensed operation is increasing.

Slow Morse Transmissions

Slow Morse transmissions, for practice purposes, have again been radiated daily on frequencies within the 1·8 Mc/s. band. This service has proved of very great value to those who aspire to a licence and who live within a reasonable distance of one or more of the practice stations. Further offers of assistance will enable a wider area to be covered.

The Council records its thanks to the Honorary Organiser, (Mr. C. H. L. Edwards, G8TL) and to all members who co-operated with him by radiating practice transmissions.

V.H.F. Developments

The Council has been pleased to note an ever-widening interest in the new very high frequency bands which are now available to U.K. amateurs. The results achieved, often with quite simple equipment, have attracted attention in scientific and Government circles.

The activities of those members engaged on V.H.F. work have been recorded month by month in the Society's Journal and in that connection the Council records its thanks to Mr. W. H. Allen, M.B.E. (G2UJ), author of "Around the V.H.F.'s."

Band Planning

In April, after considering the views put forward by a very large number of members, the Council announced its proposals for voluntary band planning. No voluntary scheme can be perfect but as the result of close observations it would seem that the plan has been well received both at home and abroad.

The Council records its thanks to the European I.A.R.U. Societies who furnished the R.S.G.B. with helpful suggestions and who later gave wide publicity to the final plan.

Scientific Observations

Steady progress has been made by the Groups engaged on making scientific observations and certain data of considerable value has been forwarded to the U.R.S.I. The organising Committee has continued to maintain a close liaison with other scientific bodies.

The Council records its thanks to the members of the Scientific Observations Groups, and to Dr. R. L. Smith-Rose, who has acted as advisor to the Committee.

Lectures

During the period from September, 1948, to May, 1949, a number of important papers were read at the Society's meetings held at the Institution of Electrical Engineers, London. A list of these papers follows :

September 24, 1948 : "Scale Model Aerials" with Demonstration, by Mr. F. Charman, B.E.M. (G6CJ).

October 29, 1948 : "Speech Clipping," by Mr. P. F. Cundy, A.M.I.E.E. (G2MQ).

November 26, 1948 : "Equipment for the 144 Mc/s. Band," by Mr. E. A. Dedman (G2NH).

December 30, 1948 : Discussion on 420 Mc/s. work opened by Mr. W. A. Scarr, M.A. (G2WS) and Mr. D. N. Corfield, D.L.(Hons.), A.M.I.E.E. (G5CD).

February 25, 1949 : "Impedance Matching," by Mr. H. A. M. Clark, B.Sc.(Eng.), A.M.I.E.E. (G6OT).

March 25, 1949 : "Technical Publishing," by Mr. G. Parr, A.M.I.E.E.

April 29, 1949 : "Some Aspects of High Quality Sound Recording and Reproduction," by Mr. R. W. Lowden, M.B.K.S.

May 27, 1949 : "The Design of Communication Receivers," by Mr. D. W. Heightman (G6DH.)

The Council records its thanks to those who read papers.

Membership

For the first time in the recent history of the Society a drop in membership has been recorded, but this is less serious in magnitude than had once been anticipated.

As at June 30, 1949, the membership of the Society totalled 14,038 compared with 14,439 nine months earlier. A list showing the number of members in the various grades at certain fixed dates is given below.

Grade	Sept. 30, 1947	Sept. 30, 1948	June 30, 1949
Home Corporates	12,105	12,336	11,851
Overseas ,,	546	651	672
Life	79	90	95
Honorary ...	8	8	8
Associates ...	1,132	1,354	1,412
Totals	13,870	14,439	14,038

Both the Overseas Corporate and Associate sections show an increase in numbers, but in the Home Corporate section a reduction of 485 is recorded. A variety of reasons is no doubt responsible for this falling off, the chief of which may well be a desire to effect economies. It is also known that many younger members have been unable to establish transmitting or receiving stations, due to the difficulty of acquiring suitable housing accommodation.

Representation

The scheme of representation which commenced on January 1, 1948, has continued to operate with considerable success in most parts of the United Kingdom. With the passing of time it has become clear that the Town Representatives are the "key-men" in the scheme. Without keen and enthusiastic T.R.'s the County and Regional Representatives are unable to achieve full success.

During the period from October, 1948, to June, 1949, many hundreds of local meetings were arranged by T.R.'s, and there is ample evidence to show that these functions provided members with valuable opportunities to discuss their technical problems.

The County Representatives are appointed to act as a link between their Regional and Town Representatives. In order to do this effectively the C.R.'s are expected to make regular visits to the active town groups in their county, but in many parts of the country such visits—except to very local centres—have been the exception rather than the rule. Lack of satisfactory travelling facilities, particularly at weekends, when many of the meetings take place, has been chiefly responsible for the inability of many C.R.'s to carry out this duty effectively.

The high service rendered by the majority of the Town, County and Regional Representatives is duly acknowledged by the Council.

Regional Representatives' Conference

In order to obtain the views of the R.R.'s on a number of current matters of interest, a Conference took place in Birmingham during April. With two exceptions all the Regional Representatives were present.

At this meeting it was decided that in future the Council shall put forward the name of a Corporate Member for election in any Region as a Regional Representative and that the Corporate membership shall then have the power to make similar nominations for election. It was also agreed that in future every nomination submitted on behalf of a Regional, County, Town or Area Representative shall be supported by five Corporate Members in the Region, County, Town or Area concerned.

Official Regional Meetings

During the period covered by this Report, Official Regional Meetings took place in Edinburgh (October 24, 1948), Luton (April 10, 1949), Coventry (April 24, 1949) and Porthcawl (May 22, 1949). Since the end of the financial year meetings have been held in Glasgow, Aberdeen, Nottingham and Brighton. Thus the plan, laid down in 1948, to hold an O.R.M. in each Region once every two years has been carried to a successful conclusion. The Council is, however, mindful of the fact that the attendances recorded at some of the meetings have been disappointingly small. Travelling and catering difficulties, coupled with a rather widespread desire to economise, have been responsible for the smaller attendances.

The General Secretary attended each meeting and delivered an address on matters of general interest. He was supported by members of the Council, and on occasions by the Assistant Secretary (Miss May Gadsden).

The Council desires to thank those who organised meetings and extended hospitality to its representatives.

Contests

A comprehensive series of Contests designed to cover a wide range of interests was organised by the Contests Committee.

The B.E.R.U. Contest again attracted good support as did National Field Day. Both of these events were fully reported upon in the BULLETIN. Innovations were a 2 Metre Field Day and a 2 Metre Contest, events which did much to promote and stimulate interest in this new amateur band. The

Top Band Contest was so well supported that the Committee decided to organise a second event later in the calendar year.

The task of drawing-up rules for the various Contests and the judging of results has thrown a great deal of work on the Contests Committee who are cordially thanked for performing a yeoman service.

Headquarters' Station

The frequency marker service provided by GB1RS has been appreciated by many members. It is regretted, however, that it has not yet been found possible to extend the facilities of this station. The solution would appear to lie in the transfer of the equipment to the home of a qualified member who would maintain and operate the station.

QSL Bureau

Once again the Council records its grateful thanks to the QSL Manager (Mr. A. O. Milne, G2MI) and his assistants, all of whom have carried out their voluntary duties with great zest. Only by adopting efficient distribution methods has it been possible for the Bureau to handle the vast quantity of cards which is received, amounting to about 30,000 each week.

Amateur Radio Exhibition

The success of the first Amateur Radio Exhibition prompted the Council to stage a second Exhibition in November, 1948, at the Royal Hotel, London.

The support afforded to this venture was even greater than anticipated, thanks to the whole-hearted co-operation given by industrial concerns, Government Departments and publishing houses. Attendance figures were considerably higher than in 1947 and business was brisker. Spurred on by the success of the first two exhibitions the Council arranged a third to take place in November, 1949.

Affiliated Societies

During the period covered by this Report, 24 local Societies and Clubs applied for, and were granted, affiliation.

The Council has been pleased to accept an offer from the Edgware and District Radio Society to present a trophy for annual competition between the affiliated societies, and this will be competed for, for the first time, during 1950.

Committees of the Council

The following is a list of the Committees of the Council which were constituted during the year:

Codes of Practice. — Chairman, Mr. I. D. Auchterlonie, G6OM.

Contests.—Chairman, Mr. F. Charman, B.E.M., G6CJ.

Finance and Staff.—Chairman, Mr. A. J. H. Watson, F.S.A.A., G2YD.

G.P.O. Liaison.—Chairman, Mr. A. E. Watts, G6UN, later Mr. W. A. Scarr, M.A., G2WS

Membership.—Chairman, Mr. S. K. Lewer, B.Sc., G6LJ.

Scientific Observations.—Chairman, Mr. W. A. Scarr, M.A., G2WS.

Technical.—Chairman, Mr. H. A. M. Clark, B.Sc. (Eng.), A.M.I.E.E., G6OT.

The Council desires to record its appreciation to the members who have served on the various committees.

Silent Keys

It is again the sad duty of the Council to record the passing of a number of members including one of its Past Presidents, Mr. H. Bevan Swift, G2TI, who served the Society faithfully and well over a period of many years. A "Bevan Swift" fund, the proceeds of which will be used to perpetuate his memory in some tangible form, has been inaugurated.

Headquarters

The Council once again records its best thanks to the General Secretary and his staff for the conscientious and efficient manner in which they have carried out the decisions and instructions of that body, and for the able manner in which they have executed the administration of the Society's affairs.

The General Secretary, in addition to attending all O.R.M.'s held during the period covered by this Report, was also present at a number of Society functions in London and the Provinces.

Conclusion

It is not possible in this Report to refer to many other matters dealt with by the Council but a perusal of the Resumes of the Minutes of the Proceedings at Council Minutes will show that they were diverse in character.

The retiring Council feels sure that the progress reported will continue and that members will, as hitherto, give their full support to the new Executive when it takes office in January, 1950.

Council Meeting Attendances

The following is a list of attendances at Council meetings for the period from October 1, 1948, to June 30, 1949:

Name	Possible Attendances	Actual Attendances
Desmond, V. M. ...	9	8
Scarr, W. A.	9	8
Lewer, S. K.	9	9
Watson, A. J. H. ...	9	8
Milne, A. O.	9	9
Mathews, J. W. ...	9	8
†Allen, W. H.	5	5
†Amos, A. G. P. ...	5	5
Auchterlonie, I. D. ...	9	6
Charman, F.	9	4
Corfield, D. N. ...	9	9
*Craig, W. N.	1	1
†Thorogood, P. A. ...	5	5
‡Edwards, C. H. L. ...	4	4
‡Evans, K. M.	4	1
‡Hammans, R. H. ...	4	3

† *Elected February*, 1949. * *Co-opted June*, 1949.
‡ *Retired January*, 1949.

Society Trophies

The Council has been pleased to award the **Rotab Cup** for the current year to **Mr. C. G. Allen, G81G** in recognition of his outstanding DX achievements. During the past four years Mr. Allen has qualified for the Empire DX Certificate, the Worked All Zones Award and the DX C.C. Certificate. He has also achieved a high place in recent VK/ZL Contests, and in 1947 was 1st in the Open C.W. section.

The Council has also been pleased to make the following further awards for the current year:—

B.E.R.U. Senior Trophy	**Mr. G. F. Cole, VK2DI**
B.E.R.U. Junior Trophy	**Mr. A. E. Seymour, ZB1Q**
B.E.R.U. Receiving Trophy ..	**Mr. W. L. Ely, BRS1535**
Col. Thomas Trophy (to the leading U.K. station in the Senior B.E.R.U. Contest)	**Mr. W. E. Russell, G5WP**
Braaten Trophy (to the leading English station in the A.R.R.L. DX Telegraphy Contest) ..	**Col. E. S. Cole, G2EC**
Arthur Milne Trophy (to the leading U.K. station—other than English —in the A.R.R.L. DX Telegraphy Contest)	**Mr. L. Hardie, GM2FHH**
N.F.D. Shield	**East Molesey Group**
Arthur Watts Trophy (in connection with the 420 Mc/s. tests) ..	**Mr. J. Spragg, G3APY**

In the absence of any outstanding accomplishments, the Council has decided to make no awards at present in connection with the Wortley Talbot or Courtenay Price Trophies.

THE MONTH ON THE AIR

By ARTHUR MILNE (G2MI)*

Danger Mark

THERE has been an unfortunate tendency recently for "rare" DX stations "to park" themselves four or five kilocycles *outside* the amateur band. Simple folk, keen on a contact, are being tempted out to have a go. Be warned in time! It is not safe to assume that a station on *the edge* of a band is actually inside. Make sure, before you risk running into trouble.

The Queer Things We Say

What is "any possible call"? That queer eventuality so many go over to seek! Why do so many remark Hi! Hi! every dozen or so words? Worse than that H.I. H.I. What is a "What have you"? The piece of apparatus so many stations appear to use. We overheard one station recently who used one as a master oscillator and another somewhere in the aerial system!

What was the joke when a station remarked with a chuckle, "I'm using two 813's in push pull but there's only 20 watts on them! 100 watts heater power for 20 watts input. Seems the joke was on him—or was it?

Notes and News

G6RH offers the following: FN8AD, 14085. VP8AN (Argentine Island) 14050. VP8AK (S. Shetland) 14005. VP8AO (South Georgia) 14001. VP8AP (S. Orkneys) 14100, FK8AC, 14005; PZ1QM, 14015; and SP5AC. BRS18348 draws attention to AF5QCM and AF5QML on 27990 kc/s. and AK2CO on 14411 kc/s. It would appear that these stations are operated by the Military Amateur Radio Service in the U.S. or U.S. bases overseas. The QTH for AK2CO was given as A.P.O. 863, c/o Postmaster, N.Y.C. Other items are PK3WH, c/o Box 222, Soerabaya, Java, and VS6BE, Box 541, Hong Kong. PK3WH and PK4DA have been heard on 28 Mc/s.

G8ML says LA9YC was operated by the Public Schools Exploration Society; he worked them in a three-way with G5BM. The operator was G5YN and it is presumed cards should go to him.

W2AKX will be pleased to hear that MD4JG has recently sent cards covering all his QSO's. MB9AG is now DL2MO.

G8PL answers G6XS's Utah query. He says W7KGP and W7MY have both been worked on 14 Mc/s. C.W. and that the former has QSL'd. W7AMX states that W7ORH and W7UOW are also active. G8PL still needs Arizona and Delaware.

G8PB recently entertained VQ5JTW for the week-end and celebrated by working VP8AN, VP8AI and VP8AO. G2MI making a test transmission recently on 28 Mc/s. C.W. also raised VP8AI.

Our apologies to the city of Hereford; we were taking a rather historical view last month but G3NA points out that there are *seven* active stations in the city, namely, 2BYM, 2DFL, 3ERL, 3ESY, 3EYH, 3NA and 3WY.

ZB1AM is now back in Britain, and living at 95 Queensdale Crescent, Knowle, Bristol 4. He has QSL'd all contacts from both ZB1AM and XACP.

W3DPA wants the present address of ZD6DT. Can anyone oblige?

Another SOS. Can anyone please give the present QTH of the following: Y17G, MD6AR, YI2AM, YI6T (card from AC4YN), VQ6HOS and EQ1RX?

G3DRQ says if you want a card from FA9UO, please send your QSL to 20 Bis Avenue G. Clemenceau, El. Biar, Algiers. He is not a member of R.E.F., who apparently do not deliver cards to non-members. He claims to QSL 100 per cent. FRS 212 in Lueneburg, Germany, continues to hear all continents on 28 Mc/s., despite sunspots, fade-outs and aurora.

ZD2S says the shoals of useless S.W.L. reports have just got him down. ZD2GHK is now home again. ZD2G is away in South Africa. ZD2FB has been located. G3EFK who is now ZS6VI says his G call is being pirated.

MD7DC QSL's 100 per cent. The station is a joint effort on the part of twelve operators. Crystal frequencies are 7020, 7040, 14040 and 14080. The station works from 1500 G.M.T. to 0600 G.M.T. daily except Sundays.

ZS6QP reports reception of Alexandra Palace sound channel on October 8, at 1400 G.M.T., at S9 plus 40 db. A recording of the programme was made and played during the evening programme on the local network.

G3CED has heard ZL4GA and another ZL4 on 3·5 Mc/s. (559) at 0650 G.M.T. Don't forget to spread out a bit, chaps!

G2EC reports several DU's active including 1HR, 1GT and 1AQ. FN8AB has been heard. HB1EO/HE has come through with a card. PJ5FN on 14105 has been heard and ZS9J worked. W6NVN/KW6 on 14072 at 2045 G.M.T. and W6BKV/KW6 are worth looking for. A card has been received from ZA2AA. G6ZQ worked a three-way with KG6FX and JA2CL for an hour on October 13.

G3HK tells us that VP5BD is on 3·5 Mc/s. BRS18348 has heard FY8AC at 0213 G.M.T. He gave QTH as Cayenne, French Guiana, and says he is the only amateur in the colony.

KZ5IP has his card from FU8AA and says FM8AD does not QSL. This seems quite a common complaint in regard to the French Colonials.

W6YNK/HS1 asks us to state that he was definitely operating from dry land whenever he used /HS1—only W6YNK/MM was mobile marine. Talking of MM there is now a Mobile Marine radio club—secretary is W5AXI/MM. They issue a tasteful certificate of honorary membership to all who can produce QSL's from 25 mobile marine stations.

Ethiopia

In a long and interesting letter, ET3AF gives us the "gen." He says the only genuine ET's have the figure 3 and that ET1IR was unlicensed and should be regarded as a pirate. Stations active at present are ET3AD, E, F, J, K, and M. 'AF is mainly on 28 Mc/s. 'AD, E, J, and M are Americans and mainly work W's on 14 Mc/s. 'AK is a YL operator and works only on 14 Mc/s. C.W. All stations except 'AD are in Addis Ababa. 'AD is at a missionary hospital about 300 miles up country at a small place called Gimby. 'AD, 'AE and 'AJ are all missionary doctors. 'AK is a school-teacher. Cards are arriving in considerable quantities from ET3AF and everyone will be QSL'd in due course. He is using an HT9 transmitter with a pair of 35T's in the final, 28 Mc/s. and 14 Mc/s. beams, an HRO and an Eddystone 640 with a preselector ahead of it. His address is Box 858, Addis Ababa. He is handling the QSL Bureau for Ethiopia.

Continued on Page 157.

* 29 *Kechill Gardens, Hayes, Bromley, Kent.*

LOW POWER CONTEST RESULTS

THE growing interest in really low power operation is reflected in the record post-war entry for the 1949 Low Power Contest held on October 1–2. More than 40 official logs were received while many other members took the opportunity of testing simple equipment. The revised rules, which were generally well received, encouraged entrants, this year, to reduce power to less than ½-watt : in practice input powers as low as 200 milliwatts were used successfully.

Leading Entries

Mr. T. F. Herdson, G6ZN, of Horbury, Yorkshire, repeated his 1947 success by finishing at the top of the table : 116 contacts with 41 counties giving him a lead of more than 1,000 points over his nearest rival. To achieve the remarkable score of 2,730 points, G6ZN operated for part at least of each hour throughout the 24-hour contest period. More than 80 per cent. of his contacts resulted in calling the station concerned rather than from CQ calls. His transmitter was a single-stage Hartley oscillator using an SP220 valve running at 5 mA. (reduced to 3 mA. for a number of contacts) from a 90 V. H.T. battery. Apart from the valve, the transmitter consisted of a coil, one variable and two fixed condensers, two chokes, a fixed resistance, a milliammeter and a Morse key. What could be simpler ? Yet his signals were reported from all over the British Isles at an average strength of S5·7 ! Two end-fed aerials, 135 ft. and 265 ft., and a 6-valve superhet completed the station.

R.S.G.B. CONTESTS, 1950

January	*14–15*	*B.E.R.U. First Section Telegraphy.*
January	*21–22*	*B.E.R.U. Telephony.*
January	*28–29*	*B.E.R.U. Second Section Telegraphy.*
February	*4–5*	*" Top Band " (1·8 Mc/s.).*
March	*5*	*Affiliated Societies.*
May	*6–7*	*144 Mc/s.*
June	*3–4*	*National Field Day.*
July	*2*	*144 Mc/s. Field Day.*
August	*20*	*420 Mc/s.*
Sept. 30–Oct. 1		*Low Power (3·5 Mc/s.).*
November	*18–19*	*" Top Band " (1·8 Mc/s.).*

Mr. R. D. McMillian, G2CWY of London, N.W.11, was runner-up : his total of 1,680 points being derived from 70 contacts with 28 counties. The station's normal 3-stage L.F. transmitter (EF50 Colpitts oscillator—1852 harmonic amplifier—807 P.A.) was used : at first with 87 V. H.T. controlled by a VS70 regulator tube and later with a 72 V. H.T. battery. The aerial was a ¾-wave horizontal wire, more than half of which was indoors, fed by an 80-ohm line and with additional loading to bring the radiator to an equivalent full-wave. The receiver was a BC312. Operating time was limited to approximately 14 hours.

Summing Up

An analysis of the leading 20 logs shows that six stations used single-stage transmitters (including 3 crystal-controlled oscillators), 11, two-stage variable frequency transmitters and 3, multi-stage variable frequency transmitters. G8JR, the leading C.C. station, employed a battery-driven P2 valve with three crystals available. G3AYO made 62 contacts with a 6V6 C.O. using only a single crystal. But despite the marked predominance of variable frequency control, notes other than T9 were comparatively rare. A number of the receivers were home-built, while G3AZY deserves mention for his use of an 0-V-1.

A few reports of interference from high-power and telephony stations were received but the majority of entrants were well satisfied with the degree of co-operation extended to them by the other users of the band. Several stations were guilty of tuning their V.F.O.'s while their transmitters were radiating : a bad operating practice even with low power equipment. A number of valuable suggestions were made for the rules of next year's event and these will be carefully considered by the Contests Committee. Most participants will echo the comment of G6BQ who found the contest " novel, interesting and enjoyable."

Pos'n.	Call Sign	Power (watts)	Contacts	Points
1	G6ZN	0·27–0·45	116	2,730
2	G2CWY	0·36–0·41	70	1,680
3	G6GM	0·5–2	80	1,665
4	G5MP	0·5	68	1,650
5	G6NC	0·5	65	1,620
6	G8NF	0·48	60	1,490
7	G8JR	0·2–0·45	57	1,420
8	G3ANQ/A	0·5	58	1,380
9	G3ATU	0·3–0·47	53	1,350
10	G3EDW	0·5–2	58	1,283
11	G3AEN	0·99	88	1,230
12	G6BQ	0·45–4·60	73	1,126
13	G2AJU	0·45–2	51	1,025
14	G3BGH	0·5–2	64	975
15	G4AR	0·4–3·9	82	824
16	G6WR	0·5–2	80	820
17	G3AZY	1–5	75	761
18	G3AYO	0·8–2·5	62	759
19	GI4NU	0·9–1·9	66	730
20	G5LQ	0·95	47	690
21	G6HD	0·48	26	680
22	G4QA	1–5	92	670
23	G2CIL	0·42–1·71	26	645
24	G4AL	0·9	38	610
25	GM3BL	1·9	61	600
26	G2AVC	0·5	24	590
27	G5JL	0·35–3	33	553
28	GW3CBY	1·9	57	535
29	G5LK	4	90	530
30	G3CPT	1·9–3·4	52	494
31	G2YK	2	48	490
32	G2DHV	5	96	486
33	G3BAK	0·5–4	58	480
34	G8DL	0·74	31	470
35	GM6RI	0·49–1·75	36	425
36	G3AZW	1	24	420
37	G3EIW	0·96	29	410
38	GI2HLT	1·7–3·8	40	401
39	G5RZ	2	31	375
40	G3FFN	1·8–2·7	37	345
41	G3XT	2–5	17	136

Check Logs : G2QX, 2VV, 2WS, 3ACC, 3BZK, 3FBG, 4LX, 6GH, 6JJ, GC2CNC/P.

MONTH ON THE AIR—*Cont. from Page 156.*

VR6AA

News at last. Nelson Dyett and his family found their long isolation from the City germs too much for them and all have been ill. Things are on the mend now, however. Photographs of Pitcairn have arrived, including snaps of the famous barrels of oil being unloaded. The full story of VR6AA is on its way over and we hope to publish another article in the series " DX Pearls."

Tailpiece

G2MI'S small boy again. Mail van going past : " Look, daddy, there's a QSL card motor ! "

OUR FRONT COVER

OUR front cover this month shows the receiver and transmitter control position at a post-war licensee's station. The operator is placing a *Mazda* 6P25 into a 6V6 tritet oscillator socket in the transmitter driver unit. This unit also contains another 6P25 which is functioning as a doubler/buffer stage. The output of this stage feeds the power amplifier which is housed beneath and to the left of the operating position. To the right of this is the main power unit and modulator.

News from Overseas

A RECENT visitor to Headquarters, Mr. Karl S. Sainio, OH2NM, brought news of the growing interest in V.H.F. activity in Finland where there are now some eighty active amateurs. Excellent results have been achieved on the 144 Mc/s. band, particularly by OH2OK located 11 miles from Helsinki. Starting in February, 1949, with local contacts, OH2OK has gradually increased his range. Since May many contacts have been made with SM5VL (Stockholm), a distance of 410 kilometres (255 miles). Average signal reports have been RST559x but under favourable conditions S8 has been obtained. It has been noticed that contact is impossible if rain is falling in either Stockholm or Helsinki. OH2OK, whose signals were received by ON4CC (Antwerp) during July, has also made contact—as reported in the October BULLETIN—with SM5MN (Linkoping) a distance of 580 kilometres (360 miles).

Most of the Finnish V.H.F. stations are using the latest types of V.H.F. gear whilst five are equipped with crystal-controlled converters with at least one R.F. stage and 3·5 Mc/s. I.F.'s. All the transmitters are crystal-controlled with inputs in the region of 100 watts; A1 (C.W.) being invariably used. The most popular P.A. valve is the American 3E29. Particular attention has been devoted to low-angle radiation: for example OH2OK uses a 16-element stacked dipole array with a wire net reflector. Although similar reflectors have been used in the U.K. on 420 Mc/s., comparatively little attention appears to have been given to their use on 144 Mc/s. The value of low angle radiation has once again been demonstrated by the fact that only those Swedish stations with efficient low-angle aerial arrays have been contacted. OH2OK operates on 144·00 Mc/s.

OH2NM, who has been visiting England in connection with the purchase of a high-power S.W. transmitter for the Finnish broadcasting system, was originally licensed in 1919, and operated for several years on "spark" before changing over to valve transmitters. He made his first contact with the British Isles as far back as 1924 when he worked G5KO of Bristol. He is also well known as the operator of OIX7 just after the war. For 15 years he was President of the Finnish Society (S.R.A.L.).

Finnish amateurs, who must pass technical and Morse examinations, are normally restricted to 50 watts but can obtain special permission to use powers up to 200 watts. They are allowed to operate on 50 Mc/s. An increasing amount of British radio equipment is being imported into Finland.

* * *

Many amateurs are interested in comparing the terms of overseas licences with those issued in this country. A recent visitor from Melbourne—Mr. Dave Wardlaw, VK3ADW—supplied the following details of the Australian licensing system. There is now only one class of VK licence, for which an annual fee of £1 (Australian currency) is charged, and this permits the use of A1 (C.W.), A3 (telephony); and A2 (M.C.W.) on the V.H.F. bands; power being limited to 100 watts. The examination system is of considerable interest. Combined Morse and technical examinations are held by the Radio Branch of the Post Office which also issues commercial operating licences. These examinations are held at three-monthly intervals. The Morse test consists of sending and receiving at 14 w.p.m. with not more than 10 errors in 5 minutes. The technical examination lasts 2½ hours and is followed by a 30 minutes' test on licence regulations, operating procedure and the international Q-code. The percentage of amateurs to the total population in Australia is considerably higher than in the U.K.

* * *

The *Union de Radioaficionados Espanoles* (U.R.E.), originally founded in 1921, has recently resumed activities which were suspended in 1936 on the outbreak of the Spanish civil war. Although a number of stations have been active during the past few years, it is only lately that their position has been legalised. However, rules have now been approved in order to grant licences to Spanish citizens. The U.R.E. QSL Bureau has been re-established and cards may be sent to Post Office Box 220, Madrid. The Society includes many amateurs well-known before the war, including the President (EA4AD) and the Secretary (EA4LQ).

The 15th. A.R.R.L. DX Contest

THE results of the 1949 A.R.R.L. DX Contest published in the September and October issues of *QST* show that the high rate of scoring, which has become such a feature of this annual event, was fully maintained this year. In the C.W. section XF1A made 3,051 contacts in 46 hours: with a multiplier of 87 (out of a possible 90) this gave him a grand total of 796,311 points. Other high scorers included CM9AB (2,066 contacts, 498,840 points) and KV4AA (2,085 contacts, 491,222 points). Highest European score was achieved by EI4Q whose 1,345 contacts and 58 multiplier gave him a total of 233,508 points. The leading U.S. station, W8BHW, had 475 contacts with stations in 113 countries to give him 390,450 points.

In the telephony section W2SAI had 600 contacts and a total of 313,200 points, while high scorers outside the United States included KP4ES (1,219 contacts, 214,524 points) and HC1KP (755 contacts, 190,400 points). The highest European total was made by G2PU with 793 contacts and 97,990 points. points.

Leading U.K. Scores

C.W. Section

	Contacts	*Multiplier*	*Points*
England			
G2EC	764	58	130,442
G8KG	590	56	99,120
G5BZ	510	48	72,960
G4CP	457	48	65,424
G2MI	481	44	62,480
G8IP	385	41	47,273
G6RB	308	47	43,240
G3GN	300	46	40,940
Multiple operator stations:			
G6CJ (G3SU)	746	58	130,036
G6LX (ZS5YF)	774	55	128,645
Northern Ireland			
GI2FHN	316	35	31,990
Scotland			
GM2FHH	568	44	73,788
Wales			
GW5SL	519	42	64,512

Telephony Section

England			
G2PU	793	41	97,990
G8QW	681	31	62,806
G2XV	543	34	55,012
G5HB	360	35	37,555
G5CP	359	26	27,768
Scotland			
GM2UU	192	32	18,304
Wales			
GW2UH	353	24	25,200

Quiz Answers

(See page 152)

1. W2BSR. 2. 1899. 3. 1915. 4. 80,000. 5. 1924.

REPRESENTATION

The following Corporate members have been duly nominated to serve as Regional, County, Town, Area or District Representatives.

Regional Representatives

Region	Name, Call-Sign (or B.R.S.) and Address
1	*G. WEBSTER (G5GK), School House, Simonstown, Burnley, Lancs.
2	*C. A. SHARP (G6KU), 56 Moore Avenue, Wibsey, Bradford, Yorks.
3	*D. A. G. EDWARDS (G3DO), 25 Pilkington Avenue, Sutton Coldfield, Warwickshire.
4	W. A. MEAD (G5YY), 135 Clarence Road, Derby. *Dr. E. S. G. K. VANCE (G8SA), 43 Blackwell Road, Huthwaite, Nr. Mansfield, Notts.
5	*S. J. GRANFIELD (G5BQ), 47 Warren Road, Cambridge. R. F. G. THURLOW (G3WW), North House, Wimblington, Nr. March, Cambs.
6	No Nomination
7	F. G. LAMBETH (G2AIW), 21 Bridge Way, Whitton, Twickenham, Middlesex. W. H. MATTHEWS (G2CD), 7 Beddington Road, Seven Kings, Essex.
8	*Dr. W. P. CARGILL (G5LR), 125 Hill Lane, Southampton, Hants.
9	H. A. BARTLETT (G5QA), Lendorie, Birchy Barton Hill, Exeter, Devon.
10	*D. A. DYER (GW8UH), 29 Ladysmith Road, Penylan, Cardiff.
11	*F. G. SOUTHWORTH (GW2CCU), Samlesbury, Holywell, Flintshire.
12	*J. DOUGLAS (GM2CAS), 223 Abbotswell Road, Bridge-of-Dee, Aberdeen.
13	*W. BAKER (G3AFL), 4 Devon Terrace, Berwick-on-Tweed.
14	*D. MACADIE (GM6MD), 154 Kingsacre Road, Glasgow, S.4.
15	*N. H. LOWDEN (G12HLT), 37 Cabinhill Gardens, Belfast. F. A. ROBB (GI6TK), 60 Victoria Avenue, Sydenham, Belfast.

* *Indicates nominated by Council.*

County Representatives

Region	County	Name, Call-Sign (or B.R.S.) and Address
1	Cheshire ...	J. B. RUDKIN (G3CDW), White Knoll, St. Margaret's Road, Hoylake.
	Cumberland	C. E. WILLIAMS (G8DP), 3 Coronation Avenue, Seaton.
	Lancashire (West)	J. BRADSHAW (G2NY), Wyngarth, Bilsborough, Nr. Preston.
		S. M. SUGDEN (G3GSS), Loretto, Gores Lane, Formby.
	Lancashire East and Westmorland	No nominations.
2	Durham ...	T. ORR (G3IV), 31 Grange Park Avenue, Sunderland.
	Northumberland, Yorkshire East, West and North	No nominations.
3	Herefordshire	M. CONU (BRS15036), 5 Orchard Gardens, Putson, Hereford.
	Shropshire and Staffordshire	No nominations.
3 *contd.*	Warwickshire	T. MARTIN (G2LB), 3 Gladys Road, South Yardley, Birmingham.
		E. G. BROWN (G5BJ), 94 Sunnymead Road, Birmingham, 26.
	Worcestershire	J. TIMBRELL (G6OI), Englefield House, White Hill, Kinver, Nr. Stourbridge.
4	Derbyshire ...	R. BONNER WILLIAMSON (G5RW), 18 Burns Street, Ilkeston.
	Leicestershire and Rutland	L. FISHER (G4MK), 20 Iris Avenue, Birstall, Leics.
		L. RIDGWAY (G2RI), 90 Romway Road, Leicester.
	Lincs. and Northants	No nominations.
	Nottinghamshire	A. GOODE (G2DTQ), 128 New Victoria Street, Mansfield.
5	Cambridgeshire	F. W. CRABTREE (G3BK), 28 Regent Avenue, March.
	Essex (outside London), Hunts and Norfolk	No nominations.
	Suffolk ...	E. J. R. COWLES (G2AJU), Post Office Farm, Sutton, Nr. Ipswich.
6	Beds, Bucks (outside London) and Herts (outside London)	No nominations.
	Oxfordshire	F. A. JEFFERIES (G8PX), 1 Lovelace Road, Oxford.
7	London (North)	No nomination.
	London (South)	C. E. NEWTON (G2FKZ), 105 Underhill Road, London, S.E.22.
	London (East)	J. HUNTER (G6HU), 63 Aintree Crescent, Barkingside, Essex.
	London (West)	S. SHARPE (G3CKX), 64 Windsor Avenue, Hillingdon, Middlesex.
8	Berkshire ...	No nomination.
	Hampshire ...	K. D. JACKSON (G3KJ), 153 Bishops Road, Woolston, Southampton.
	Kent (outside London Area)	S. A. HOWELL (G5FN), 39 Broadway, Gillingham.
		W. G. ROWLANDS (G6KT), 487 Canterbury Street, Gillingham.
	Surrey (outside London)	No nomination.
	Sussex	R. J. DONALD (G3DJD), 2 Canfield Road, Brighton.
		G. W. MORTON (G3DRC), 42 Southfarm Road, Worthing.
9	Cornwall, Dorset, Somerset and Wilts	No nominations.
	Devon ...	A. G. WHEATCROFT (BRS13968), 27 Lower Wear Road, Countess Wear, Exeter.
	Gloucestershire	A. BARBER (G5WA), Nantanpan, Windmill Road, Minchinhampton, Stroud.
		R. M. SHARPE (BRS7961), 112 St. Michael's Hill, Bristol, 2.
10		No nominations.
11		No nominations.
12	Aberdeenshire	B. MCK. DAVIDSON (GM3ALZ), 42 Smithfield Drive, Aberdeen.
	Banffshire & Kincardineshire	R. B. BROWN (GM3AOR), 15 King Street, Dundee.
	Angus and Perthshire	G. W. ROBERTSON (GM3FEU), Eden-Bank, New Road, Forfar, Angus.
13	East, Mid and West Lothian	W. BLYTH (GM5YX), 17 Elgin Terrace, Edinburgh 7.
	Fifeshire & Kinross	C. A. M. CLACKSON (GM8KR), 24 Blake Street, Brucefield, Dunfermline, Fife.
		J. TAYLOR (GM2DBX), Main Street, Leven, Fife.

Region	County	Name, Call-Sign (or B.R.S.) and Address
14	Ayrshire, Bute, Dumfries Kirkcudbright & Wigtown	T. ELLIOTT (BRS10053), 98 Portland Street, Troon.
	Clackmannan and Stirlingshire	B. B. FULTON (GM4JQ), Kerton, Burnbrae Road, Falkirk.
	City of Glasgow	A. H. MASON (GM6MS), 390 King's Park Avenue, Rutherglen.
15		No nominations.

Town or Area Representatives

Region	Town or Area	Name, Call-Sign (or B.R.S.) and Address
1	CHESHIRE	
	Northwich ...	G. HINDLEY (G3CRE), 24 Townfield Lane, Barnton.
	Wirral	H. M. SYNGE (G3BOC), Ardwyn, Border Road, Heswall.
	CUMBERLAND	
	West Cumberland	C. DAWSON (G3SY), 16 Markhouse Road, Workington.
	LANCASHIRE—EAST	
	Bolton	C. GORE (BRS17251), 8 Daffodil Road, Farnworth.
	LANCASHIRE—WEST	
	Liverpool ...	A. BELL (G3FBH), 20 Craigside Avenue, West Derby.
	Preston	H. WOODS (G2AXH), 13 Merrick Avenue, Farrington Park.
	Southport ...	F. H. P. CAWSON (G2ART), 113 Waterloo Road.
2	DURHAM—COUNTY	
	Darlington ...	E. C. SUTTON (G8IA), 37 Davison Road.
	South Shields ...	J. ORR (G8JO), 22 Pembroke Terrace.
	Sunderland ...	J. BATES (BRS12907), 22 Ewesley Road.
	YORKSHIRE—EAST	
	Hull	G. L. FISH (G3ADJ), 81 Park Street.
	York	P. S. ROBSON (G3FYP), 7 Galtros Road, Shipton Road.
	YORKSHIRE—WEST	
	Barnsley ...	C. T. MALKIN (G5IV), 5 White Hill Terrace.
	Bradford ...	J. H. MACDONALD (G4GJ), Mayfield, Wagon Lane. Bingley.
	Catterick and Richmond	A. R. GLOVER (G2HNL), 16 Finkle Street, Richmond.
	Cleckheaton ...	J. CLEGG (G3FQH), 38 Shirley Grove, Gomersall.
	Doncaster ...	H. FLINTHAM (BRS193), 50 Burton Avenue, Balby.
	Harrogate ...	E. P. INMAN (G2DRA), 27 Harlow Crescent.
	YORKSHIRE—NORTH	
	Middlesbrough ...	H. WALKER (G3CBW), 9 Chester Street.
3	HEREFORDSHIRE	
	Hereford ...	T. B. ATKINS (BRS7280), The Priory, Stretton Sugwas.
	WARWICKSHIRE	
	Birmingham—North	W. J. BUTLER (G5LJ), 32 Pilkington Avenue, Sutton Coldfield.
	South	T. F. HIGGINS (G8JI), 391 Rednal Road, Northfield.
	Coventry... ...	H. J. CHATER (G2LU), 10 Middlemarch Road.
	WORCESTERSHIRE	
	Malvern	F. E. WINGFIELD (G2AO), Branksome, Worcester Road.
	Stourbridge ...	W. A. HIGGINS (G8GF), 28 Kingsley Road, Kingswinford, Nr. Brierley Hill, Staffs.
4	DERBYSHIRE	
	Derby	C. DRINKWATER (G3FNK), 307 Burton Road.
	LINCOLNSHIRE	
	Boston	A. OUGHTON (G8BQ), 49 Fydell Street.
4 *contd.*	NOTTINGHAMSHIRE	
	Nottingham	A. E. CLIPSTONE (G8DZ), 71 Melton Road, West Bridgford.
		B. H. SINGLETON (G3CZV), 13 Tithby Drive, Sherwood.
	Mansfield ...	J. BEWLEY (G8HX), 116 Westfield Lane.
	NORTHAMPTONSHIRE	
	Peterborough ...	L. CRITCHLEY (G3EEL), 36 Waterloo Road.
5	CAMBRIDGESHIRE	
	Cambridge ...	T. A. T. DAVIES (G2ALL), Meadowside, Comberton.
	ESSEX	
	Southend-on-Sea	P. F. CLARKE (G3CQL), 29 Station Road, Leigh-on-Sea.
	SUFFOLK	
	Ipswich	S. G. KEEBLE (G2AN), 139 Sidegate Lane.
6	BEDFORDSHIRE	
	Luton	J. PLOWMAN (G3AST), 119 Farley Hill.
	OXFORDSHIRE	
	Oxford	D. COLLINS (BRS17378), 5 Ellesmere Road.
7	LONDON—NORTH	
	Barnet	R. WALKER (G6QI), 7 Potters Lane, New Barnet, Herts.
	Enfield	H. T. MACFARLANE (G8SK), 15 Rotherfield Road, Enfield, Middlesex.
	Finsbury Park Area (N.1, 4, 5, 7, 16 and 19)	R. C. HARRIS (G2BAB), 9 Queens' Drive, Finsbury Park, N.4.
	Hoddesdon ...	H. JONES (G4HJ), 99 Stanstead Road.
	LONDON—SOUTH	
	Barnes, Putney and Richmond	R. F. WOOD (BRS12165), 28 Nassau Road, Barnes, S.W.13.
	Coulsdon ...	L. C. B. BLANCHARD (BRS3003), 122 St. Andrew's Road.
	Croydon	R. L. GLAISHER (G6LX), 279 Addiscombe Road.
	Gravesend ...	P. F. JOBSON (BRS9195), 13 Brandon Street.
	Lewisham, Lee and Catford	G. V. HAYLOCK (G2DHV), 63 Lewisham Hill, S.E.13.
	New Cross and Dulwich	H. F. KNOTT (G3CU), 7 Red Post Hill, S.E.24.
	Woolwich, Plumstead and Abbey Wood	R. HALLS (G3EIW), 48 Raglen Road, S.E.18.
	LONDON—EAST	
	Chingford ...	W. G. HALL (G8JM), 48 Hawkdene, N. Chingford, E.4.
	Grays	C. MUNDY (BRS15584), 68 Chestnut Avenue.
	Ilford	H. T. SCOTTON (BRS16486), 32 Albemarle Gardens.
	Romford ...	A. E. GLAZIER (G3CRR), 40 Lancaster Avenue, Barking.
	LONDON—WEST	
	Ealing	R. CAWS (G3BRL), 34 Greystoke Lodge, Hanger Lane, W.5.
	East Molesey ...	L. COOPER (G5LC), 3 Summer Avenue.
	Harrow	H. HARDY (G4GB), 12 Lawn Close, Ruislip.
	Uxbridge ...	R. T. BOWLER (BRS9422), 180 High Street.
	Slough	R. RIVERS YOUNG (G3BTP), 16 Elmhurst Road, Langley, Bucks.
8	HAMPSHIRE	
	Christchurch ...	J. SINGLETON (BRS9196), 51 Walcott Avenue.
	Petersfield Area ...	R. T. DEALEY (G6DT), Woodville, Drill Hall Road, Horndean.
	Southampton	P. A. MAINWARING (G3BSM), 30 Coxford Road.
		L. M. WORBOYS (G3AFD), Meldreth, Portsmouth Rd., Sholing.
		E. R. BASSETT (BRS16075), 42 Norham Avenue, Shirley.
	KENT	
	Tonbridge and Tunbridge Wells	F. BARNARD (G4FB), 34 Springwell Road, Tonbridge.
	Medway Towns...	J. J. SPRINGATE (G3CAZ), 130 Grange Road, Gillingham.
	SURREY	
	Farnham and Farnborough	J. ST. C. T. RUDDOCK (G8TS), 80 Byworth Estate, Farnham.

Region	Town or Area	Name, Call-Sign (or B.R.S.) and Address
8 *contd.*	SUSSEX	
	Bognor Area ...	R. ALLEN (G2DSP), Farndell, Upper Bognor Road.
	Brighton and Hove	A. E. LAMBOURNE (G5AO), 23 Glynde Road, Brighton, 7.
	Worthing	R. B. FORGE (G3FRG), 2 The Plantation. H. PALMER (G3BF), Brackencote, Uplands Avenue.
9	CORNWALL	
	Falmouth ...	A. L. ROGERS (G2FQD), 25A Arwenack Street.
	Hayle	J. GILBERT (G2CQB), Home View, St. Erth.
	GLOUCESTERSHIRE	
	Bristol	D. B. NEWPORT (G3CHW), 145 Ilchester Crescent, Bedminster Down, Bristol, 3.
	Gloucester ...	E. A. PERKINS (G3MA), 40 Calton Road.
	Stroud	B. HORTON (G3CBH), Prescott, Haven Avenue, Bridgend, Stonehouse.
	DEVON	
	Exeter	T. W. A. SMITH (G3EFY), 98 Ladysmith Road.
	SOMERSET	
	Bath	R. S. HEAD (G3FII), 9 Dunsford Place.
	Taunton	F. H. WRIGLEY (G2BDO), Ballmead, Pyrlands.
12	ANGUS	
	Forfar	J. A. CLARK (GM2H1K), 30 North Street.
	Dundee	W. G. DUNCAN (GM2HFV), Royal Hotel.
	ABERDEENSHIRE	
	Aberdeen ...	S. MACKAY (GM2FTN), 8 Asgrove Road.
13	Berwick-on-Tweed Area	R. LYALL (G8SG), Ewart, Wooler, Northumberland.
	Edinburgh ...	S. W. ROWDEN (GM6SR), Rosebank, Pilrig Street.
	FIFESHIRE	
	Dunfermline ...	J. F. SHEPHERD (GM3EGW), 12 Park Place.
	Montrose... ...	R. PEARSON (GM3CAP), 17 St. John's Cottages.
14	Ardrossan ...	J. F. MCCREIGHT (GM3DJS), 1 Knox Place, Saltcoats, Ayrshire.
	Ayr	MISS J. A. C. RAINIE (GM3AKR), 6 Montgomery Terrace.
	Dumfries... ...	G. PERCY (GM3OL), "Westland," Pleasance Avenue.
	Glasgow (Postal Districts)	W. R. EADIE (GM4JO), 51 Sutherland Avenue, Pollokshields, Glasgow, S.1. I. HAMILTON (GM3CSM), 66 Greystone Avenue, Burnside, Glasgow.
	Kilmarnock ...	J. MCCRINDLE (BRS15866), 120 Bonnyton Road.
	STIRLINGSHIRE	
	Falkirk	N. HOLDEN (GM4MF), 3 Hodge Street.

Corrections or amendments to this list should be communicated to Headquarters without delay.

Ballot

It will be necessary to conduct Ballots in the following Regions, Counties and Towns:—

Regional Representatives

Region 4	W. A. Mead (G5YY). Dr. E. S. G. K. Vance (G8SA).
Region 5	S. J. Granfield (G5BQ). R. F. G. Thurlow (G3WW).
Region 7	F. G. Lambeth (G2AIW). W. H. Matthews (G2CD).
Region 15	N. H. Lowden (GI2HLT). F. A. Robb (GI6TK).

County Representatives

Region 1. Lancashire—West ...	J. Bradshaw (G2NY). S. M. Sugden (G3GSS).
Region 3. Warwickshire	E. G. Brown (G5BJ). T. Martin (G2LB).
Region 4. Leicestershire	L. Fisher (G4MK). L. Ridgway (G2RI).
Region 8. Kent (outside London Area)	S. A. Howell (G5FN). W. G. Rowlands (G6KT).
Sussex	R. J. Donald (G3DJD). G. W. Morton (G3DRC).
Region 9. Gloucestershire	A. Barber (G5WA). R. M. Sharpe (BRS7961).
Region 12. Angus and Perthshire ...	R. B. Brown (GM3AOR). G. W. Robertson (GM3FEU).
Region 13. Fifeshire and Kinross ...	C. A. M. Clackson (GM8KR). J. Taylor (GM2DBX).

Town Representatives

Region 4. Nottingham	A. E. Clipstone (G8DZ). B. H. Singleton (G3CZV).
Region 8. Southampton	E. R. Bassett (BRS16075). P. A. Mainwaring (G3BSM). L. M. Worboys (G3AFD).
Worthing	R. B. Forge (G3FRG). H. Palmer (G3BF).
Region 14. Glasgow (Postal Districts)	W. R. Eadie (GM4JO). I. Hamilton (GM3CSM).

Voting

Corporate Members resident in the Regions, Counties and Towns concerned are invited to record their vote in favour of one of the above candidates, and to forward same on a *postcard* addressed to the General Secretary, Incorporated Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, by not later than November 30, 1949.

Prescribed Form of Voting Card

Election of Representatives 1950/1.

I ..... *being a fully paid-up*

Corporate Member of the Society, wish to record my vote in favour of

Mr. ..... *as*

Regional Representative for (Region) .....

County Representative for (County) .....

Town Representative for (Town) .....

(Strike out whichever not required.)

Signed .....

Call-sign (or B.R.S.) .....

Address .....

VOTES FOR REPRESENTATIVES MUST **NOT** BE INCLUDED IN COUNCIL BALLOT ENVELOPES. CLOSING DATE FOR VOTING CARDS IN CONNECTION WITH THE ELECTION OF REPRESENTATIVES, WEDNESDAY, NOVEMBER 30, 1949

Home Constructed Impedance Bridge

MR. A. SIMMONS (BRS11164) points out that the paragraph on power factor calibration in the article "Home Constructed Impedance Bridge" published in the September, 1949, issue is not correct. Although, as stated, the power factor is equal to $\cos \varphi$, where φ is the phase angle, the later references to the tangent of the phase angle, and $\tan \varphi$ should read the cotangent of the phase angle, and $\cot \varphi$. The figures mentioned under $\tan \varphi = 0{\cdot}2$, $0{\cdot}4$, etc., refer to the "loss angle" whch equals $90° - \varphi$. Thus a condenser possessing a perfect quadrature would have a zero loss angle giving $\tan \varphi = 0$, and $\tan \varphi$ of $0{\cdot}2$, $0{\cdot}4$, $0{\cdot}6$ would correspond to loss angles of approximately 11° 18′, 21° 48′ and 31° respectively.

BROWN-E.R.D. 13 inch Portable Disc Recorder
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Radio G200 *Announces*

VALVES: EF39, 6SJ7, 955, 6AG5, 5/-; 6C4's, 6SQ7, 6/6.

ENAMELLED COPPER WIRE ¼lb. reels: 16–20–22, 2/-; 24–26, 2/6; 28–30–32, 2/8; 34–36, 3/-; 38, 3/6, post free.

CONDENSERS: 8μF. 450 V., 2/6. 8 + 16μF. 450 V., 5/-. Ceramic 4pF., 20pF., 47pF., 100pF., 4/6 doz. Silver mica 90pF., 250pF., 1000pF., 1600pF., 5000pF., 4/9 doz. 0·1μF., 350 V. Sprague, 5/- doz.

12 V. VIBRATOR UNIT No. 4. Output 325 V. 80 mA. Useful car radio supply, etc. (ex. No. 22 set), price 19/6.

INERT CELLS. 40 for 12/6. 80 for 20/-, carriage paid. Sample cell, 7½d.

ARTHUR HOILE 55, Union Street, MAIDSTONE, Kent. 'Phone 3155

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Highly informative booklet covering design considerations and constructional requirements. **Now ready.** Price **5/3 Post Free.**

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MORRIS & CO. (RADIO) LTD.

ANOTHER LARGE PURCHASE AT A NEW LOW PRICE R107. ONE OF THE ARMY'S FINEST COMMUNICATIONS RECEIVERS. Nine valves, R.F. amp. osc. Frequency Changer, 2 I.F.'s (465 kc/s.), 2nd Detector, A.V.C. Af. amp. B.F.O. A.C. mains, 100–250 V. or 12 V. accum. Frequency range 17·5 to 7 Mc/s., 7·35 to 2·9 Mc/s., 3 to 1·2 Mc/s. Monitor L.S. built in. Complete. Write for full details. **£12 12s.** Carriage and packing 21/-.

SUPER MOVING COIL MIKE AND STAND. We have purchased the entire stock of a famous manufacturer of P.A. Equipment at a very low price, and are offering a £5 5s. Super Moving Coil Mike, with a chromium-plated folding stand to match. The list price of the stand was £3 3s. **We offer the pair at 79/6. Less than half the usual price.**

METER KIT

A FERRANTI 500 mA. M/C METER, with separate High Stability, High Accuracy, Resistors to measure, 15, 60, 150 and 600 V. D.C. Scale length 1¾", diameter 2¼". **10/-** the complete kit.

SECTIONAL WHIP AERIAL. Seven sections which plug into each other making an aerial 14 ft. long. Thinnest section ⅛" diameter, thickest section ⅜" diameter. Weatherproof enamel. **3/6** each complete.

INSULATED BASE for above, **2/6** each.

METERS

Full Scale Deflection	Scale Marking	External Dimensions	Movement	Price
1 mA.	0—100	3½"	M/C	15/11
1 mA.	0—1	2½" × 2½"	M/C	7/6
5 mA.	0—5	2½"	M/C	5/-
30 mA.	0—30	3½"	M/C	10/6
50 mA.	0—50	2½" × 2½"	M/C	8/6
105 mA.	0—150	2½"	M/C	6/-
250 mA.	0—250	3½"	M/C	10/-
2·5 A.	0—2·5	2½"	Thermo.	5/-
15 V.	0—15	3½"	M/I	7/6
20 V.	0—20	2½" × 2½"	M/C	5/9
40 V.	0—40	2½" × 2½"	M/C	5/9
5,000 V.	0—5	4½"	Elect.	50/-
500 u.a.	0—500	2½"	M/C	7/6
500 u.a.	0—500	3½"	M/C	19/6

GOVERNMENT SURPLUS MAINS TRANSFORMERS. Type 42, 500–0–500 V., 170 mA., 4 V. 4 A., 8" × 6" × 4", **25/-** This Transformer is so constructed that L.T. windings can easily be added without removing the core. Due to the large core section a 6 V. winding requires only 22 turns. A total of 60 watts can safely be added to the output. Type 49, 275–0–275 V. 120 mA., 5 V. 2 A., 6·3 V. 2·5 A., 6·3 V. 3 A., C.T., **19/6.** Type 52, 250–0–250 V. 65 mA., 4 V. 1·5 A., 6·3 V. 2 A., **12/6.** Type 54, 275–0–275 V. 60 mA., 5 V. 2 A., 6·3 V. 2·3 A., **15/-.** Type 55, 250–0–250 V. 100 mA., 5 V. 2 A., 6·3 V. 3·5 A., **17/6.**

WE HAVE A LARGE SELECTION OF NEW BOXED VALVES BY WORLD FAMOUS MAKERS. 6SL7, 6SA7, 6AC7, 6SJ7, 6SK7, 6V6, 6U5, 6J5, 6F8, 6C5, 6SN7, 6Q7, 6SH7, 6K7, 6X5, 6J7, 6K8, 5Z4, 5U4, 12Q7GT, 12K7, 12K8, 1S5, 6SC7, VR55, VR56, VR137, CV66, 807, VU39, IR5, VR57, 1T4, all at **6/6.** 6H6, HL23, CV73, 954, 955, 956, CV6, VR91, all at **5/-.** 717A, U74, 2X2, 1LD5, VR136, all at **7/6.** 5Z3, 5R4, 25Y5G, 25Z6, 3D6, all at **8/6.** Also many other types.

MINE DETECTOR PANELS, include three 1T4 valves, 12–1 Midget Trans., three ceramic valveholders, 18 condensers and resistors, etc., **20/-.** Without valves, **5/-.**

ALUMINIUM CHASSIS 16 S.W.G. Substantially made of bright aluminium with four sides.

	Price		Price
7" × 3½" × 2" ...	3/3	22" × 10" × 2½" ...	10/-
9½" × 4½" × 2" ...	4/-	10" × 9" × 3" ...	6/3
10" × 8" × 2½" ...	5/6	12" × 10" × 3" ...	6/10
12" × 9" × 2½" ...	6/8	14" × 10" × 3" ...	7/11
14" × 9" × 2½" ...	6/11	16" × 10" × 3" ...	8/6
16" × 8" × 2½" ...	7/3	20" × 10" × 3" ...	10/-
20" × 8" × 2½" ...	7/11		

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HEADQUARTERS CALLING

COUNCIL, 1949

President:
VICTOR M. DESMOND, G5VM.

Executive Vice-President: W. A. Scarr, M.A., G2WS.
Hon. Treasurer: A. J. H. Watson, F.S.A.A., G2YD.
Hon. Secretary: J. W. Mathews, G6LL.
Hon. Editor: Arthur O. Milne, G2MI.
Immediate Past President: S. K. Lewer, B.Sc., G6LJ.

Members: W. H. Allen, M.B.E., G2UJ, A. P. G. Amos, G3AGM, I. D. Auchterlonie, G6OM, F. Charman B.E.M., G6CJ, D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E., G5CD, P. A. Thorogood, G4KD.
Co-opted Member: W. N. Craig, B.Sc., G6JJ.

General Secretary: John Clarricoats, G6CL.

September Council Meeting

Resume of the Minutes of a Meeting of the Council of the R.S.G.B. held at New Ruskin House, on Tuesday, September 20, 1949, at 6 p.m.

Present.—The President (Mr. V. M. Desmond in the Chair), Messrs. A. P. G. Amos, W. H. Allen, I. D. Auchterlonie, F. Charman, D. N. Corfield, W. N. Craig, S. K. Lewer, J. W. Mathews, A. O. Milne, W. A. Scarr, P. A. Thorogood, A. J. H. Watson and John Clarricoats (General Secretary).

I.A.R.U. Calendar No. 37.

It was reported that the Liga Panamena de Radio Aficionados had been granted affiliation to I.A.R.U. and that the Spanish Society (U.R.E.) had applied to be reinstated to membership. I.A.R.U. Headquarters announced that the Amateur Radio Club of India, the Israel Amateur Radio Club and several other national organisations had made inquiries regarding affiliation.

(Certain other matters referred to in the Calendar were reported upon in the October issue of the BULLETIN.—Ed.)

Television Transmissions.

It was reported that the Postmaster General is not prepared to authorise the holders of amateur licences to transmit television signals. The issue of experimental licences will, however, continue to be dealt with on the merits of each case put forward.

Resolved to enquire from the G.P.O. why the Postmaster General is not prepared to authorise amateurs to transmit television signals.

Maritime Mobile Operation.

It was reported that the G.P.O. are still pursuing their enquiries and are not yet in a position to give a decision on the general question as to whether fully-qualified persons should be permitted to operate amateur transmitting equipment aboard ship, provided authority has been received from the Captain and owners.

Resolved to request the G.P.O. to give early consideration to this matter.

Aerial Masts and Supports.

It was reported that three letters had been received from members following the publication, in the July issue of the BULLETIN, of the opinion of the Society's legal advisers on the operation of the Town & Country Planning Act, 1947, insofar as it may apply to the erection of aerial masts and supports.

After considering correspondence from the Society's legal advisers it was

Resolved to record that the Council considers it unwise to attempt, at present, to obtain a national ruling which might prompt official action detrimental to the Amateur Radio movement.

Consideration was also given to letters received from the Enfield & South Birmingham T.R.'s and to a letter from the Barnet & District Radio Society.

Resolved to reply in the terms of the preceding resolution and to point out to the South Birmingham T.R. that the question of providing legal assistance in any specific case would have to be considered in the light of all relevant information.

The Secretary reported that earlier in the year Mr. A. Houchin, G3GZ, of Slough, Bucks, had been directed by the Slough Borough Council, as the local Town Planning authority, to remove a wooden tower 58ft. high which he had erected without submitting plans. Mr. Houchin later reduced the height to 33ft. but his application for permission to retain the tower in position was rejected by the Area Planning authority. Mr. Houchin then appealed to the Minister of Town & Country Planning who had agreed after a formal hearing of evidence " to allow the appellant to continue his hobby with the aid of an existing structure for a period of 12 months."

Mr. Auchterlonie stated that the Houchin case had been the subject of a discussion at a recent meeting of the Manchester & District Amateur Radio Society, and that in connection therewith the Secretary had prepared and forwarded to him a detailed history of the case. He (Mr. Auchterlonie) was satisfied that the Secretary had acted correctly and in the best interests of the members in dealing with this matter. Mr. Clarricoats had advised Mr. Houchin that he would be prepared to attend the hearing of his appeal in a private capacity, but he could not attend in an official capacity without the approval of the Council. No intimation of the date or venue of the appeal was received at Headquarters' until after it had taken place.

Membership.

Resolved—

(*a*) to elect 168 Corporate Members, 44 Associates and 10 Junior Associates.
(*b*) to grant Corporate Membership to 13 Associates who had applied for transfer.
(*c*) to grant Life Membership to Mr. J. C. W. Ickringell, BRS15762.

Affiliated Societies.

Resolved to grant affiliation to the following Societies and Clubs—

(*a*) Brentwood & District Amateur Radio Society.
(*b*) Forfar & District Amateur Radio Club.
(*c*) Oxford & District Amateur Radio Society.
(*d*) South Manchester Radio Club.
(*e*) Spen Valley Radio & Television Society.
(*f*) Garats Hay Radio Club.
(*g*) North Front W/T Station Amateur Radio Club.

Radio Amateurs' Examination.

Mr. C. H. L. Edwards wrote to suggest that the Society should request the G.P.O. to set a paper for a November examination, at legitimate Institutes teaching the Radio Amateurs' Examination course. Such an arrangement would, he contended, help those who had failed to pass the City & Guilds of London Institute examination held six months earlier.

The Secretary was instructed to thank Mr. Edwards and to explain that

(*a*) the arrangement suggested would provide unequal opportunities to the membership.
(*b*) it would be most undesirable for the G.P.O., as the licence-issuing authority, to set the paper.

Headquarters' Station.

Resolved to purchase 130 valves, representing five years' supply, for use at the above station at a special price of £79 10s. 0d.

Legal Department Proposals.

A letter was submitted from Mr. C. W. Henderson, BRS18223, wherein he suggested that the Society should set up a Legal Department, and " that a referendum be taken on this question from all members regarding their willingness to pay 10s. per annum increase in subscription to enable the Legal Department to function."

The Hon. Treasurer expressed an opinion, which was endorsed by the Council, that the legal requirements of the Society are fully provided for at present, and that the financial position of the Society is such that it can support any normal case.

Audited Accounts.

Mr. Watson submitted and explained the audited accounts for the accounting period which began on October 1, 1948, and ended on June 30, 1949.

Resolved to accept and adopt the audited accounts as submitted and to authorise same to be printed for presentation to the membership.

Resolved to record the best thanks of the Council to Mr. A. J. H. Watson for the highly efficient manner in which he has again handled the Society's accounts.

Reports of Committees

Scientific Observations.

The Chairman (Mr. W. A. Scarr, M.A.) gave an account of recent progress and reported that—

(*a*) the Manager of the Ionospheric Propagation Group (Mr. D. W. Heightman) had forwarded a considerable amount of valuable information on M.U.F.'s to the D.S.I.R. for inclusion in C.C.I.R. study charts.
(*b*) the Committee had given careful consideration to a suggestion that steps be taken to approach certain I.A.R.U. Societies with a view to the setting up of a small number of automatic transmitters operating within the 28 Mc/s. amateur band. Transmissions from these stations would prove of the greatest possible value to group members engaged on M.U.F. and other aspects of Ionospheric research.
(*c*) the Committee is co-operating with a number of other organisations engaged on scientific investigation.
(*d*) the Committee had given careful consideration to suggestions that Ionospheric Prediction Data should be published in the R.S.G.B. BULLETIN, but had decided to take no action at the present time because interest in such data is believed to be limited.

Contests.

The Chairman (Mr. F. Charman, B.E.M.) in presenting the Report of the Committee gave details of the 1950 Contests Programme, and announced that it had been decided to arrange a Telephony Contest in connection with the B.E.R.U. event.

The Committee recommended the Council to support a proposal made by W.I.A. (Australia) that Member Societies

should adopt a universal system of exchanging serial numbers for all future international contests, in the interests of simplicity and avoidance of confusion. The Recommendation was accepted.

Finance and Staff.

The Chairman (Mr. A. J. H. Watson, F.S.A.A.) reported upon certain financial and staff matters.

Staff increases, amounting in all to £1 15s. 0d. per week, were approved.

Council Nominations.

Nominations were made for the 1950 Council as per the list published in the October issue of the BULLETIN.

The meeting terminated at 10.10 p.m.

Slow Morse Transmissions

G.M.T.	*Call*	*kc/s.*	*Town*
Sundays			
09.30	G6NA	1840	Guildford
Mondays			
13.00	G3AXN	1870	Southend-on-Sea
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G3DSR	1750	Derby
20.00	G2CLD	1775	Tunbridge Wells
21.00	G2BLN	1900	Bournemouth
21.00	G8VR	1850	London, S.E.2
21.00	G3BHS	1820	Eastleigh, Hants.
22.00	G8TL	1896	Ilford
22.30	G4GA	1896	Chingford
Tuesdays			
13.00	G3AXN	1870	Southend-on-Sea
20.00	GI2HLT	1900	Belfast
22.30	G6JB	1820	Salcombe, Devon
23.00	GM4AN	1820	Kirkcaldy
Wednesdays			
20.00	PA0AA	3625	Hilversum
20.00	G3AFD	1783	Southampton
22.00	G6NA	1840	Guildford
22.00	G3DLC	1800	Grays, Essex
22.00	G2NY	1850	Preston
Thursdays			
18.00	G3AXN	1870	Southend-on-Sea
22.00	G2BCX	1990	South Woodford
22.30	G3ARU	1990	Wanstead
22.30	G3OB	1803	Manchester
Fridays			
13.00	G3AXN	1870	Southend-on-Sea
19.00	G3BLN	1900	Bournemouth
20.00	G2AJU	1900	Stutton, Ipswich
20.00	G3AKW	1860	Wirral
20.30	G8LZ	1868	Gravesend
21.00	G3BHS	1820	Eastleigh, Hants.
22.30	G6JB	1820	Salcombe, Devon
23.00	GM4AN	1820	Kirkcaldy
Saturdays			
23.00	G3CHY	1800	Ashton-u-Lyne

Volunteers are required to cover the following areas: Birmingham, Bristol, Carlisle, Kent, Newcastle, Yorkshire, North and South Wales, North, West and South London. Write to Mr. C. H. L. Edwards, G8TL, 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

London Meeting

About 150 members were present at the Institution of Electrical Engineers on Friday, October 28 last, when Mr. O. H. Davie, A.M.I.E.E., of *A. C. Cossor, Ltd.*, delivered a much appreciated lecture entitled "Design and Applications of the Cathode Ray Oscillograph." The lecture concluded with an excellent demonstration.

Questions covering a wide range of topics associated with cathode ray oscillography were ably answered by Mr. Davie, who was later thanked by Mr. P. A. Thorogood, G4KD, on behalf of all present.

The President-elect (Mr. W. A. Scarr, M.A., G2WS) was in the chair.

New Books

GUIDE TO BROADCASTING STATIONS. Fifth edition. Published by Iliffe & Sons Ltd. Size 5⅜ in. × 4¼ in. 88 pages. Price 1s. 6d.

Almost without exception Europe's four hundred long- and medium-wave broadcasting stations will be changing their wavelengths next March when the Copenhagen Frequency Allocation Plan comes into operation. In order that this new edition of "Guide to Broadcasting Stations" should not become out of date within a few months, it has been enlarged and includes, in addition to the present operating details of Europe's stations, those which will come into force on March 15th, 1950.

Operating details of nearly 1,300 short-wave stations of the world, which have been checked against the frequency measurements made at the B.B.C. receiving station at Tatsfield, are also given in tabular form both geographically and in order of frequency.

In addition to the above information on broadcasting stations, this booklet includes details of Europe's television and E.H.F. broadcasting stations, and special service stations—such as meteorological and standard frequency transmitters; world time constants; revised list of international call signs; and wave-length frequency conversion table.

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Send stamp for current Components List. Probably the most comprehensive in the trade.

RECEIVER TYPE 25. The receiver portion of the T/R 1196. Covers 4·3–6·7 Mc/s., and makes an ideal basis for an all-wave receiver, as per " Practical Wireless," August issue. Complete with valves types EF36(2), EF39(2), EK32 and EBC33. Supplied complete with necessary conversion data for home use. Only **22/6**. Chassis only, **8/6**.

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HIC ET UBIQUE

British Amateur Television Club

The first issue of a new 8-page roneoed club journal *CQ*—TV produced for the B.A.T.C. contains several technical articles, including a description of a wide-band modulation system for amateur TV work, a review of television at Radiolympia, and notes on members' activities. The Editor is Mr. M. Barlow, G3CVO, Cheyne Cottage, Dukeswood Drive, Gerrards Cross, Bucks.

Ilford Group

It was recently decided to hold Town Meetings in Ilford fortnightly on Thursdays, the meetings being so arranged that they fall in the weeks when the Chingford Town Group do not hold their fortnightly meetings.

The next meeting will be at G2BRH, 579 High Road, at 8 p.m. on Thursday, November 17. Everybody is welcome. East London meetings will continue to be held monthly on Sundays. For details see " Forthcoming Events."

Ipswich Group

The latest issue of *The Ham Ration*—quarterly newsletter of the Ipswich Group—contains, in addition to its customary quota of local notes and news, the first of a series of articles on television construction, a handy tip on the use of worn-out fluorescent lighting tubes as R.F. indicators and a timely reminder, in verse, on Safety First. Contributions for the next issue should be sent to G2AJU, Sutton, Ipswich.

Malta Amateur Radio Society

Lord Mountbatten of Burma, who is an accomplished radio operator and who has often shown a keen interest in amateur radio, recently consented to become Patron of the Malta Amateur Radio Society. Officials for the year 1950 include: *President*, Mr. F. Hague, ZB1AH; *Hon. Secretary*, Capt. R. W. Bosworth, ZB1FK; *Hon. Treasurer*, Mr. E. Montenaro Gauci, ZB1H; *QSL Manager*, Mr. R. Galea, ZB1E.

Norman Turner D/F Event

A number of local Societies were represented at the D/F Contest arranged at short notice by the Radio Section of the Ernest Turner Social Club for September 25. The 1·8 Mc/s. transmitter, operated by G8VZ, was concealed in a punt, moored beneath overhanging bushes on the west bank of the Thames, near Cookham. After the first transmission of 3 minutes, during which all participants were at Beaconsfield, and one further fixed transmission of the same period, the transmitter was operated erratically for a few moments every 10 to 15 minutes.

Mr. J. Walley of the Slade Radio Society located the transmitter in 84 minutes, to be followed 18 minutes later by Mr. K. Finch of the Ernest Turner Social Club. Other successful competitors were Mr. W. Tanser (G3BJQ), Mr. H. J. Sherry (G6JK) and Mr. S. T. Smith (G3BSI). The remaining 10 parties failed to locate the transmitter within the stipulated time of 2½ hours. Prizes donated by Mr. Norman Turner (G4NT) were later presented to the leading entrants.

Oxford and District Radio Society

Plans for the forthcoming year, which it is anticipated will show increased activity, were discussed at the recent A.G.M. when the following officers were elected: President, A. M.-M. Payne, B.A., M.D., M.R.C.P.; Chairman, F. A. Jefferies. G8PX; Hon. Secretary and Treasurer, J. Hickling, 47 Banbury Road. Meetings are held on alternate Wednesdays (7.30 p.m.) at The Magdalen Arms, Iffley Road, Oxford.

Slough Group

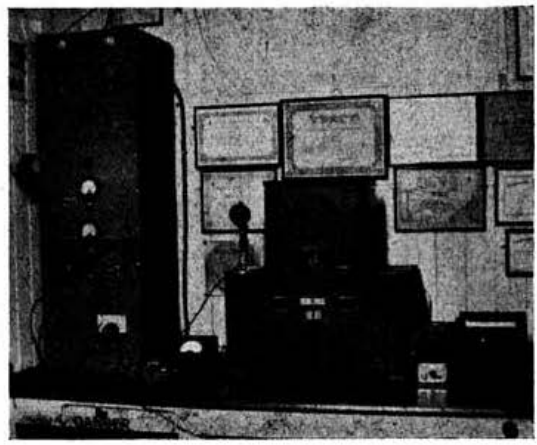
Members who wish to take advantage of the provision of official QSL cards by the Slough Borough Council should communicate with the Group Secretary, Mr. R. Young, G3BTP, 16 Elmhurst Road, Langley, Bucks, indicating the number of cards required.

South Manchester Radio Club

Recently affiliated to the R.S.G.B., the S.M.R.C. has a membership of almost 50, of whom 15 already hold amateur licences. The fortnightly meetings, which are held at the Church School Rooms, Northenden, include Morse and technical classes, lectures, general discussions and work on the Club station G3FVA. Full information can be obtained from the Hon. Secretary, Mr. M. I. Wilkes, G3FSW, 57 Longley Lane, Northenden, Manchester.

Stourbridge & District Amateur Radio Society

Twenty-eight members recently visited the B.B.C. transmitting station at Daventry. Regular meetings of the Society are held on the first Tuesday and the third Friday in each month at the King Edward's School, Stourbridge.



AROUND THE EMPIRE

Alan Frame, ZL4GA, obtained his present call in 1937 although for five years before then he was often heard under the call ZL4BQ, beginning in 1932 at the age of 14 years. Since that date there can be few British DX operators who have not enjoyed at least one good ragchew with this well-known Dunedin station, apart from innumerable contacts during the many Contests in which he has played a prominent role. New Zealand amateurs are limited to a maximum input of 100 watts; the V.F.O.—6AG7 buffer—6L6 multiplier—803 P.A. transmitter seen here is run at under 80 watts with 750 volts on the last stage. Suppressor-grid modulation is available with the use of a small 3-stage speech amplifier. The station receiver is an RCA-AR77 with an ARC-5 low I.F. Q5-er. An LM13 is used to measure frequencies. The ever-reliable full-wave Zepp accounts for the excellent 14 Mc/s. signals, while results on the low-frequency bands include forty 3·5 Mc/s. and eighty 7 Mc/s. contacts with the British Isles.

Sussex Receiving Contest

A 7 Mc/s. receiving contest, open to residents within the county of Sussex, has been organised by the Worthing and District Amateur Radio Club, for November 19-20. Details can be obtained from the Assistant Secretary, Mr. Upperton, 7 Greenways Crescent, Shoreham. Other activities of the club, described in the current issue of " Ragchew," include weekly Morse classes and a programme of lectures covering the winter months.

Side Slip

In the account of the Glasgow O.R.M. published last month Mr. J. N. Piper, GM3COE, was recorded as the winner of the voucher donated by *Clydesdale Radio*. The winner was actually Mr. Fulton, GM3CSO. The R.R. apologises to both members for the " side slip."

Mystery

Mr. A. F. Thompson, G2BXJ, 45 Blake Road, Great Yarmouth, would be grateful if any amateur who received a visit from Mr. Norman L. Janin, W7FAX of Portland, Oregon, U.S.A., on October 5th last, would communicate with him at the above address.