

SHORT WAVE NEWS

Vol. 1.
No. 7.
JULY, 1946.

In this Issue:

ON THE HAM BANDS.

BROADCASTING NEWS.

V.H.F. NEWS.

MY FAVOURITE RX.

PHOTO-TELEGRAMS.

STATION LIST.

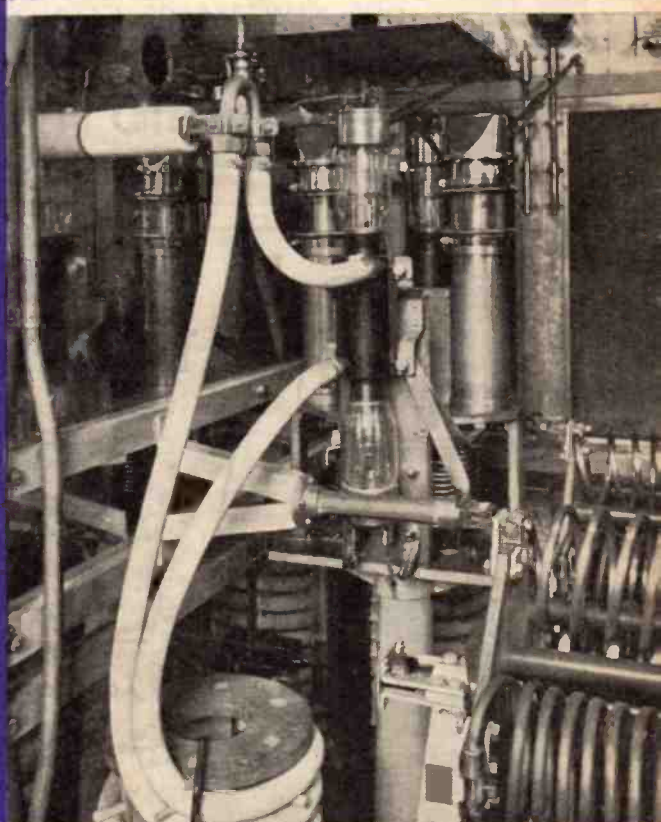
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AND

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SUPERHET

THE G.P.O. RUGBY STATION

FREQUENCY/WAVELENGTH
CHART



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AN AMALGAMATED
SHORT WAVE PRESS
PUBLICATION.

1/3

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SHORT WAVE NEWS

Vol. I. No. 7.

Annual Subscription, 16/-.

July, 1946

Editor : ARTHUR C. GEE, G2UK.

Asst. Editor : W. NORMAN STEVENS

Advertisement & Business Manager : C. W. C. OVERLAND, G2ATV.

Progress.

WITH the last issue, "Short Wave News" was six months old. A glance through the first six numbers will reveal that a steady improvement has been maintained. Since it is impossible at present to make the magazine more voluminous, owing to the still-imposed paper controls, our immediate improvements must obviously be in the form of quality rather than quantity.

In a periodical of this type it is very true that the Editors rely to a large extent upon the co-operation of their readers. The more news that is contributed, the higher the standard of the completed articles. Therefore, to improve our features, we must have more news. Considering the tender age of our magazine we count ourselves fortunate in having had such splendid co-operation from our readers, and we take this opportunity of thanking all of you who have taken such an interest in sending in your items of news. But remember—we can never have too much news!

How You Can Help.

Our regular contributors "Monitor" and "CQ" always welcome items of news interest, however trivial, and useful short wave reception logs. Transmitting readers are invited to submit a short "write-up" on their station, together with one or more clear photographs, for inclusion in "Around the Shacks." Those with a bent for construction can add their support, too, in our feature "My Favourite Receiver." In the latter two features, by the way, we present the printing blocks to the contributors, who can then use them to illustrate their SWL or QSL cards.

EDITORIAL

And, of course, there is the question of correspondence. Although our mail now reaches considerable proportions, we can never receive too many letters that express views on the magazine. Let us have your candid views and criticisms, tell us exactly what you would like to see, and what current features you think are best. Don't be afraid to speak your mind—we like it better that way!

Will all contributors please note that in future ALL correspondence should be addressed to the magazine, with the name of the departments (such as BC News, 60 Mcs., etc.) marked on the top left-hand corner of the envelope.

The Embryo Radio Amateur.

Many of us who were actively interested in amateur radio before the war, do not realise that six years have slipped by since we last were able to devote much time to our hobby. Still less do we realise that many who now wish to join our ranks were little more than school-children when war began. These enthusiasts have had little opportunity to acquire the conventions and customs which are so familiar to us. This has been brought home to us by the number of correspondents who enquire about such things as the etiquette of QSL'ing, the "Q" code, and so forth. We hasten to assure our younger readers that they will have priority attention in our pages for such information, as we regard them as the backbone of the amateur radio fraternity of the future. Let us know some more of your difficulties, O.M.'s.

W.N.S.

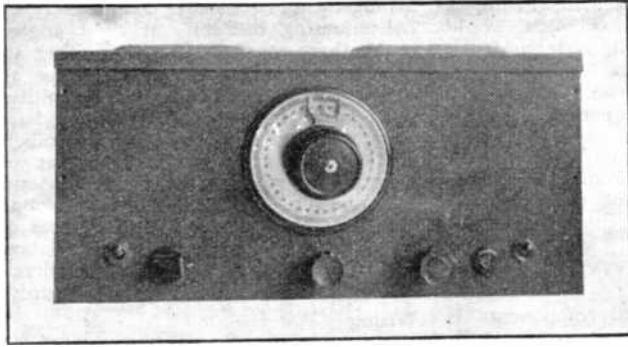
NOTICES

THE EDITORS invite original contributions on short wave radio subjects. All material used will be paid for. Articles should be clearly written, preferably typewritten, and photographs should be clear and sharp. Diagrams need not be large or perfectly drawn, as our draughtsman will redraw in most cases, but relevant information should be included. All MSS must be accompanied by a stamped addressed envelope for reply or return. Each item must bear the sender's name and address.

CLUB SECRETARIES are invited to submit details of activities for insertion in our monthly club notes, which must arrive at this office by the 15th of each month.

COMPONENT REVIEW. Manufacturers, publishers, etc., are invited to submit samples or information of new products for review in this section.

ALL CORRESPONDENCE should be addressed to "Short Wave News," 57 Maida Vale, Paddington, London, W.9. Telephone CUN. 6579.



A Basic S.W. Superhet

A constructional description of a set for DX short-wave listening, and, if required, for subsequent conversion to a communications type.

By Bence Yap

I WELL recall that in pre-War days there was a certain reluctance on the part of amateurs, in tackling super-het circuits for short-wave work, and since my return to civilian life I have been astonished to find to what extent this still exists. No one is more ready than I to fully concur with the adherents of the straight circuit that it certainly does confer all the advantages claimed for it, and presents an excellent start in our hobby for those with little experience in constructional work or for those with light purses.

After the fascination of getting DX with simple receivers has lost some of its novelty, the listener looks round for something bigger, but when he comes to the super-het he seems to rear in alarm. I feel radio journals are largely to blame for this state of affairs by over-emphasising the difficulties. That these difficulties are real, no one will deny, but they are not so formidable as many constructors begin to think. I have no doubt that readers who have taken the plunge in super-het construction will warmly support me in this, especially as there are now several makes of super-het coils with details for tracking, etc., readily available.

On my return from the Services I had to start from scratch and the receiver based on this circuit was built as a foundation for a more complicated final job. Space was left for a BFO, the addition of an r.f. stage,

and a possible noise limiter and other refinements as the need and opportunity arose. For me, at the time, it was an ideal plan, giving me both a worth-while receiver in quick time with an opportunity to get the "essence" of the circuit working to its maximum efficiency before the refinements were added. No doubt there are many readers ready for the plunge from straight set construction to the deeper waters of the super-het who may wish to start something on these lines.

Those whose knowledge of the working of the super-het is at all rusty (or incomplete) are advised to read up a little theory first, and for the reader who has never given the matter much serious thought I would recommend "Radio Circuits" by W. E. Miller (3/6). This book deals with the circuit stage by stage in a delightfully simple and easily readable manner.

Little difficulty should be experienced if the constructor sticks to the capacities and operating conditions given by the manufacturers of the coils he decides to use, otherwise he may not be able to get the set tracking correctly throughout the full tuning range.

A study of the circuit reveals it to conform to sound standard practice, and for those who wish to construct it in a "final" form, a suggested layout is also given. The more serious constructor, however, is recommended to give careful consideration

to any additions he may wish to make at a later date. For instance, the fitting of an R.F. stage on a future occasion, would require space left for coil, a separate or another gang section to the condenser and the valve. The valve would, of course, come before the frequency changer (6K8G) and space should be left there to accommodate it. A little time spent in long-term planning, may save much bother later in having to reconstruct in order to introduce some highly desirable feature.

Components

No particular make of components is specified—good quality parts of any well-known make will be found quite satisfactory. Under present conditions particular items cannot be generally obtained and any *equivalent* will serve. Indeed, I should imagine it to be impossible for any single reader to duplicate all the parts in the original set!

The coils used are of the *Denco Maxi Q* plug-in type and were chosen to obviate losses in wave-band switching. They are fitted with octal bases and as the oscillator padder connections are brought out to different pins on each range, the correct padding condenser is automatically selected as the coil is changed. With the recommended values of padding capacitors no difficulty should be experienced in securing correct tracking, although actually this is simpler in short-wave receiver work than in broadcast receiver design. These coils are available for either 465 kcs. or 1.6 mcs. intermediate frequencies. If the Wearite "P" type coils are chosen, parallel trimmers will be necessary on windings L2 and L3—with the Maxi-Q coils trimming is effected by adjustment of the core. *Messrs. Wright & Weaire* are also making a permeability tuned coil-pack complete with switching, one model covering two short-wave and the medium-wave band. The oscillator coil must be connected the right way round so that the windings are in phase, otherwise the set cannot work properly, but this can be easily determined by experiment if the information is not given by the coil manufacturers.

In the original model 465 kcs. I.F.'s were used. These were of the air-core type, but economy of space can well be effected by the use of the iron-core pattern.

The tuning capacitor is of the ganged type (.00015 μ F). Separate capacitors can be used if preferred and by doing so any problems of tracking could be obviated, although tuning becomes a more tedious business.

It would, of course, have been an ideal arrangement to ensure complete isolation by mounting the coils at right angles to each other, one below and the other above the chassis, but this idea has to be abandoned on the grounds of inaccessibility for wave band changing, unless the reader prefers to use chassis type mounting coils with switching. Even then, careful layout would be necessary to avoid long leads. Actually a simple screen between them was found to be quite satisfactory, although I was quite prepared for something more elaborate. The screen should be placed the diameter of the coils away from each of them.

Wiring

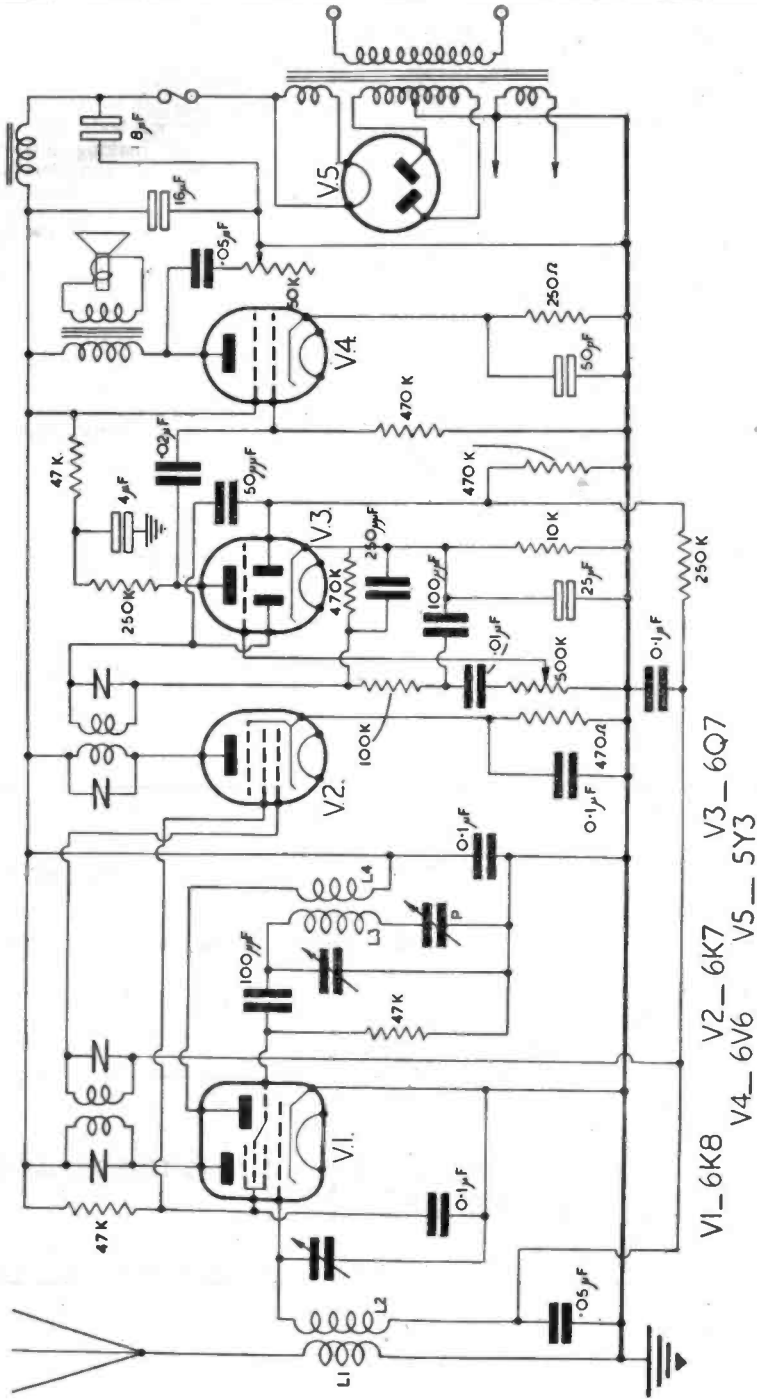
The wiring of the anode and grid circuits of the 6K8G (triode-hexode frequency changer) calls for a little thought on the part of the constructor. It must be arranged to ensure the isolation of the two frequencies. All the wiring should be carried out with rigid copper wire by the shortest possible routes. The single earthing point wiring plan should be followed to avoid varying r.f. chassis potentials which would cause instability if direct chassis earths were made at odd points throughout the set.

The A.V.C. system is a conventional arrangement, although smaller value components could be tried for reduced time-constant to counter rapid fading often met with in short wave reception. A switch is fitted in the original model to short the A.V.C. line to earth when it is not required.

Little further need be said about the I.F. stages as long as the frequency is the one for which the coils were designed, except perhaps that it is preferable to use types with colour-coded leads. If the windings are "out of phase" there is some liability of their oscillating when aligned. If they are not colour coded or marked, the correct method of connection can be found by experiment, but it will ordinarily be found that the outside lead of each winding is led to the grid and anode respectively. The iron-core types are normally trimmed by adjustment of the core slugs, but if those used are trimmed by capacitors the under-side plates should be connected to the high potential ends to avoid the frequency changing by additional capacity while being adjusted.

Tone Control.

The tone control will be found most useful for reducing background noise. As it is adjusted, much of the unwanted mush will disappear, but the high note response is attenuated which tends to make speech become somewhat muffled. A nice balance



Theoretical Circuit

between the two evils can be found by having it variable. Increase in the size of the capacitor in the 6V6G anode circuit will give a greater "top-cut" and its capacity should be chosen to meet individual tastes—.01 uF. will probably suit the average listener.

Cabinet

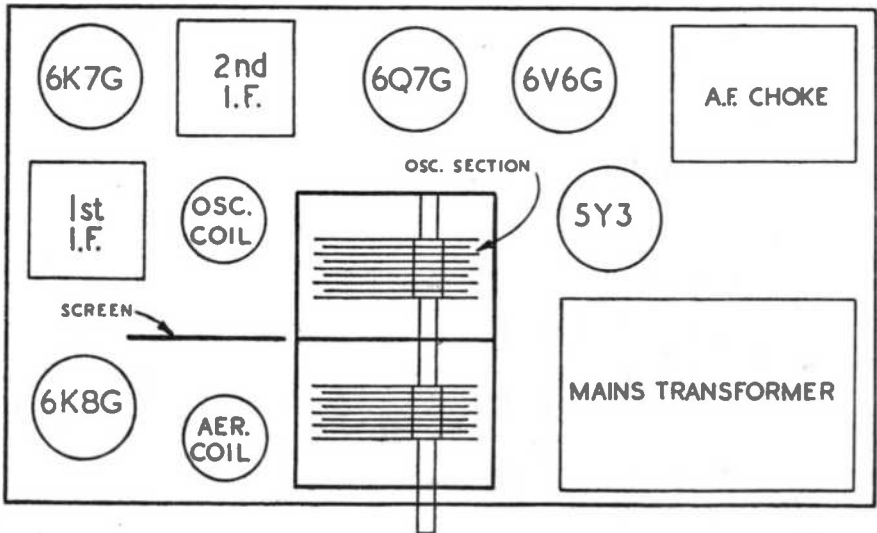
It has been assumed that the reader will house his set, like the original, in a metal cabinet so that it is only necessary to contend with interference introduced via the aerial. Local static will be dealt with by the normal means, but it often occurs that a station is transmitting on or near the intermediate frequency giving rise to a beat note with the I.F. signal. This fault can be overcome by the use of an I.F. rejector (or filter) in the aerial circuit. It can well be made from winding taken from an old I.F. transformer of the same intermediate frequency, complete with trimmer, mounted in a screened position and wired between the aerial terminal and the coil. When the I.F. transformers have been aligned, the signal used for their alignment should be injected at the aerial terminal and the filter trimmer adjusted to the point of minimum response. If at any later date the I.F.'s are re-aligned the filter will also require adjustment.

Alignment

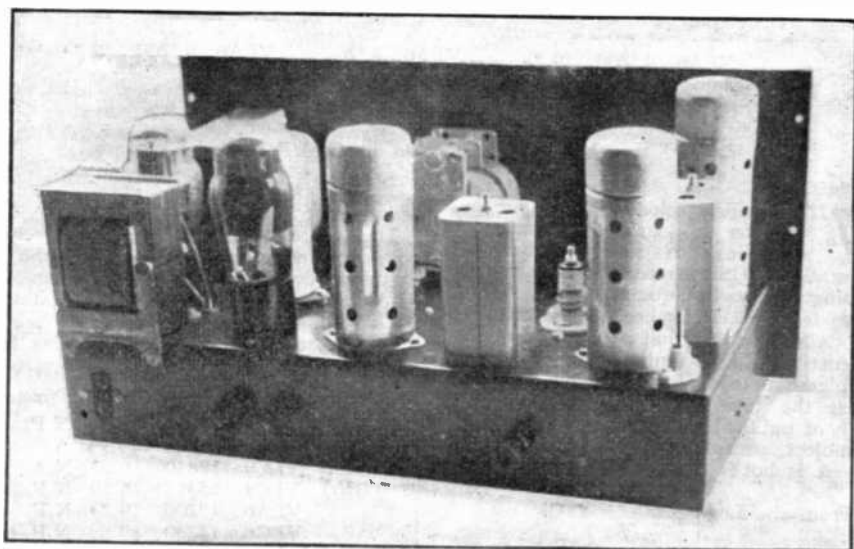
The circuits need to be brought into alignment before signals can be properly received. It is possible for this to be done by trial and error methods depending on received signals for making adjustments, but this would require considerable patience. Most constructors, however, will have some access to an oscillator, either through their local club or a friend, or alternatively your local dealer may be willing to help in this respect. An I.F. Liner (*Bulgin*) could, in the absence of an oscillator, be used for the I.F.'s and the tracking adjusted on a number of strong signals throughout the tuning range.

The frequency changer circuit (6K8G) is the only part requiring special low-loss components. This, of course, includes the valve holder, coil holders and tuning capacitor. From that part of the circuit, signals are dealt with first at the intermediate and then the audio frequencies, where no special precautions are needed.

As this receiver in its basic form is by no means complicated, no difficulties should be experienced in construction providing good components and a sound layout are used, but the following points should be given special care. The wiring, particularly that of grid and anode leads, should be direct and well spaced and the use of



Suggested Layout.



Rear View of the Basic Receiver.

screened wiring avoided as far as possible to avoid self-capacitance. The fly lead to the grid of valve 6K7G, if long, should be screened, as also should the lead to the grid of the 6Q7G. If the metal casing of the volume and tone controls are not joined to chassis via the fixing device, a wire should be soldered to them and taken to earth. The On/Off switch, if desired, can be ganged with the tone control, but under no circumstances should it be ganged with the volume control. The volume control circuit must not only be well away from both mains and R.F. wiring, but the leads must be short and direct as possible. This can best be assured by mounting them on brackets near the valves concerned using extension rods for their control.

Sensitivity and Selectivity

This type of circuit, without proposed additions, is the basis of most of the better modern broadcast receivers and while it gives markedly improved results over the straight type of circuit, it still has proneness to certain disadvantages which are particularly marked in critical short-wave work. For instance, while it is much more selective than the straight, because of its greater sensitivity, the improved selectivity may not be sufficient for the very exacting conditions now prevailing in the crowded short wave bands. It is too, of necessity, prone to second channel interference, that

is, the reception of signals transmitted on a frequency of a difference of twice the intermediate frequency from that to which the receiver is tuned.

An R.F. stage before the frequency the original model, partly because of limited additional tuned circuit will be capable of rejecting the interfering signals. Indeed, since the photographs were taken, I have found opportunity to add such a stage and a description of it will appear in a subsequent issue.

Tuning

Electrical bandspread was not used on the original model partly because of limitations in the chassis dimensions, but chiefly because it was intended to use an ultra slow motion drive on the final version. Actually the set was designed for all round use as it was to be mainly employed for DX short-wave broadcast listening. Electrical bandspread could well be incorporated if ganged capacitors are used and the necessary spreader could be a "cut-down" of a small-sized ganged capacitor. It should, of course, be mounted as near as possible to the main tuning capacitor, with which it would be wired in parallel. Normally the tuning will be found quite satisfactory for most uses if the capacitor sections do not exceed .00015 uF and fitted with a drive reduction of say 40 to 1.

Around the Broadcast Bands.

Monthly survey by "Monitor"

All times are given in G.M.T.

WILL readers please note that, in addition to logs and reports, we welcome such data as QRA's of new stations, QSL's received, and in fact anything likely to interest other readers of this feature. Reference to this month's Editorial will show that all future correspondence should be sent via the magazine, and please note that the closing date for logs is the 15th of the month preceding month of publication. That's about all on the subject, except—let us have your news while it is hot!

● From the Log-book

15095 kcs. (19.86m.): HCJB, Quito. Heard at very good strength at 2230. Also operating on the 12460 and 9960 kcs. channels (24.04 and 30.10 metres). The latter two frequencies prone to severe CW QRM. The programme broadcast at this hour is "Evening Vespers" and is in English.

15270 kcs. (19.64): KCBR, Delano, California. Heard at R7 at 2200 with news in English at dictation speed.

● Station QRA's

Here is this month's selection for the "wallpaper" collectors:—

XEQQ:—Estacion XEQQ, Radio Pan-americana S.A., Apartado 940, Mexico, D.F. Mexico.

"Radio Omdurman":—Broadcasting Officer, Public Relations Office, P.O. Box 282, Khartoum, Sudan.

"Radio Wien":—Osterr Radioverkehrs, A.G., Argentinierstrasse, 30a, Vienna 4

ZFY:—The British Guiana United Broadcasting Co., Ltd., P.O. Box 272, Georgetown, British Guiana.

"Radio Andorra":—Roch D'Ells Escolls, Andorra la Vieja, Andorra.

PZC, PZH5, etc.:—Gouvernements Radio Dienst, Paramaribo, Surinam, D.W.I.

XEWW:—Apartado 2516, Ayuntamiento 54, Mexico, D.F. Mexico.

KU5Q:—Public Information Radio, Guam, Marianas.

"Radio Sofia":—Radio Sofia, Information Service, Sofia, Bulgaria.

HP5K:—Apartado 33, Colon, Panama Republic.

● "Australia Calling"

The following schedules have recently been received by your scribe from the Department of Information, Melbourne. The VLA stations use 100 kW., VLC stations 50 kW., and VLG stations 10 kW. The following schedules were effective as from April 15th:—

G.M.T.	Call	Freq.	W/L	Directed to
2115-2300	VLA6	15200	19.74	N.P.
2300-2330	VLA6	15200	19.74	A.
2340-0400	VLC9	17840	16.82	N.A.
0200-0400	VLC4	15315	19.59	N.P.
	VLA6	15200	19.74	N.P.
	VLG6	15230	19.69	N.P.
0315-0725*	VLA6	15200	19.74	N.P.
0500-0545	VLG4	15315	19.59	W.N.A.
	VLG3	11710	25.62	W.N.A.
0600-0640	VLC4	15315	19.59	T.
	VLG3	11710	25.62	T.
0730-0814	VLA6	15200	19.74	A.
0730-0755	VLG3	11710	25.62	A.
0815-0853	VLG10	11760	25.51	N.C.
0800-0853	VLC8	7280	41.21	B.I.
0835-1215	VLA6	15200	19.74	N.P.
0858-1300	VLC6	9615	31.20	A./N.P.
	VLG3	11710	25.62	A./N.P.
1300-1400	VLA	7280	41.21	A./N.P.
	VLG3	11710	25.62	A./N.P.
1300-1350	VLC5	9540	31.45	E.N.A.
1400-1429	VLA	7280	41.21	S.E.A./P.
1400-1450	VLC6	9615	31.20	S.E.A./P.
1415-1500	VLG	9580	31.32	S.E.A./P.
1500-1600	VLC8	7280	41.21	B.I.
	VLA3	9680	30.99	B.I.
1500-1545	VLG	9580	31.32	B.I.
1600-1700	VLG4	11840	25.34	W.N.A.
	VLC6	9615	31.20	W.N.A.

* Saturdays only

The key for the last column is as follows: A.—Asia; A./N.P.—Asia and the North Pacific area; B.I.—British Isles; E.N.A.—Eastern area of North America; N.A.—North America; N.C.—New Caledonia; N.P.—North Pacific area; S.E.A./P.—South East Asia and the Pacific; T.—Tahiti (Society Islands); W.N.A.—Western area of North America.

Reports on reception are always welcomed and the address for all VLA, VLC, VLG, VLH and VLQ stations is:—"Radio Australia," Department of Information, 375 Collins Street, Melbourne, C.I.

COUNTRY PANEL

No. 3: Nicaragua.

- YNBH: Managua. "Radio Pan-americana," 6547 kcs.
 YNDG: Leon. "La Voz de Leon," 7660 kcs., 200 watts.
 YNET: Masaya. "Radio Masaya" and "Emisora del Pueblo," 100 watts (recently moved from 7103 kcs. to unknown frequency).
 YNFT: Granada. "La Voz de la Sultana," 7502 kcs., 100 watts.
 YNJAT: Leon. "La Voz del Aire," 5758 kcs., 500 watts.
 YNLAT: Granada. "La Voz del Mombacho," 7615 kcs., 200 watts.
 YNOW: Managua. "La Voz de la America Central," 6850 kcs., 600 watts.
 YNPS: Managua. "La Voz de Nicaragua," 6758 kcs., 800 watts.
 YNQ: Managua. "La Voz de la Victoria," 6950 kcs.
 YNWW: Granada. "Radio Sport," 6877 kcs.
 YNXW: Managua. "Radio America," 6273 kcs., 100 watts.

heavy fading for long periods. Your scribe would be very interested to know how other readers are receiving these transmissions. We would also be interested to hear if any U.S. ultra high frequency stations are being received.

● **Oddments**

Readers may have noticed that the English transmissions from PRL8, the famous "Radio Nacional," have ceased. This, however, is only a temporary measure, and regular English transmissions will be resumed from this popular station when the "Radio Nacional" service has been re-organised.

"Radio Omdurman" has recently decided to alter their aerial systems. They are now using a folded dipole in place of the original rhombic and reports are solicited on any noticeable changes in signal strengths. Their QRA is in this month's list.

Fair signals have been noted from Parede, Portugal, over CS2WI, announcing as "Radio Clube Portuguese" on 12400 kcs.

Schwarzenburg heard opening Latin American Service at 2330 over HE15, 11715 kcs. The station makes use of an attractive series of chimes as an identification signal and then opens with a march, presumably the Swiss Anthem.

Finland has put in an appearance through OIX4, 15190 kcs. (at 1330), and OIX2, 9495 kcs. (at 2200).

Eddy Startz with the "Happy Station," PCJ, has been reported on approximately 49.8 metres. Programme starts at 1340 on Wednesdays and Sundays.

QSL's of an entirely new design are now being used to confirm reception reports. The card has a pale blue background on which is superimposed, in yellow, an outline map of Australia from which "sprouts" an aerial mast. The authorities are now catching up on reports received during the past few years and are verifying all back reports. Your scribe recently received 10 QSL's in a batch!

● **Aussies to look for**

The A.B.C. National programme can be heard over VLR 9540 kcs.; VLH4, 11875 kcs. (25.25m.); and VLQ, 7240 kcs. (41.44m.). Heard around 2215. VLG7, 15160 kcs., carries this service from 2045 to 2200. Heard once with B.B.C. relay at 2055, QSA4 R7 with CW QRM.

The A.B.C. News can be heard over VLH5, 15230 kcs. (19.69m.) at 0015. Is usually about R5. VLG3, 11710 kcs., heard with news at 0415 and 0515 at R8/9. Experimental transmission to British Isles has been logged from VLA4, 11770 kcs. (25.49m.) at 0700-0750. Signals were R9. Transmission was also taken by VLG (R5).

● **U.H.F.**

The B.B.C. Television sound channel is being received at my QTH in 1930 on 41.5 Mcs. with varying signals (R6-2) with

CORRIGENDUM

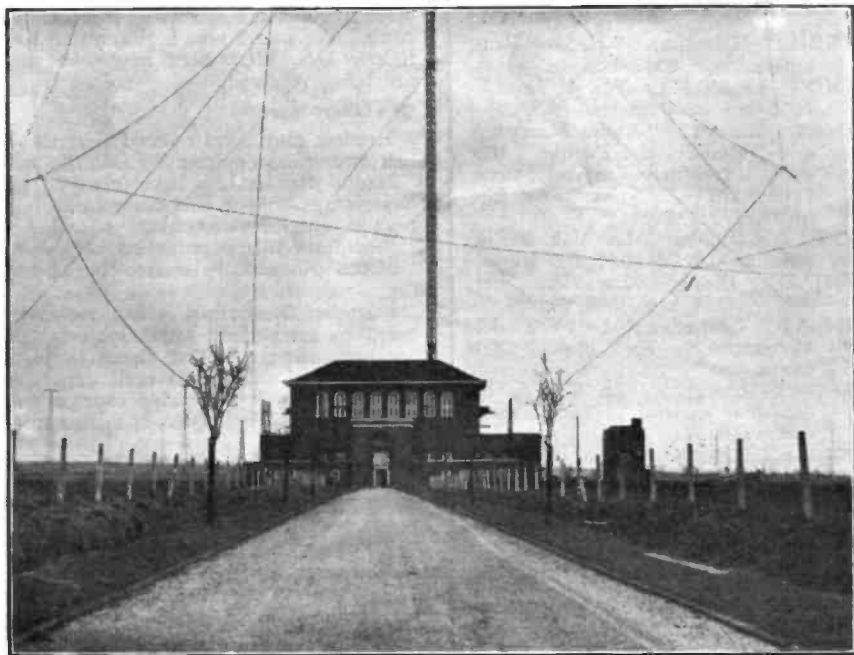
June issue: Page 137, "EA50 triode" should read "EA50 diode." Page 145, second paragraph of The Adjustment of Crystal Oscillators, "The reading in milli-amperes . . ." should be "The reading in volts . . ."

Attention all G9's!

We note from the *RSGB Bulletin* that calls in the G9 series are now being issued to stations of commercial concerns. We feel this will cause much embarrassment in certain quarters!!

New Calls.

The *Bulletin* also reports that first batch of application forms for post-war amateur licences was despatched on June 11th. New calls, when issued, will be in the series G3, followed by three letters.



The G.P.O.'s Rugby Radio Station

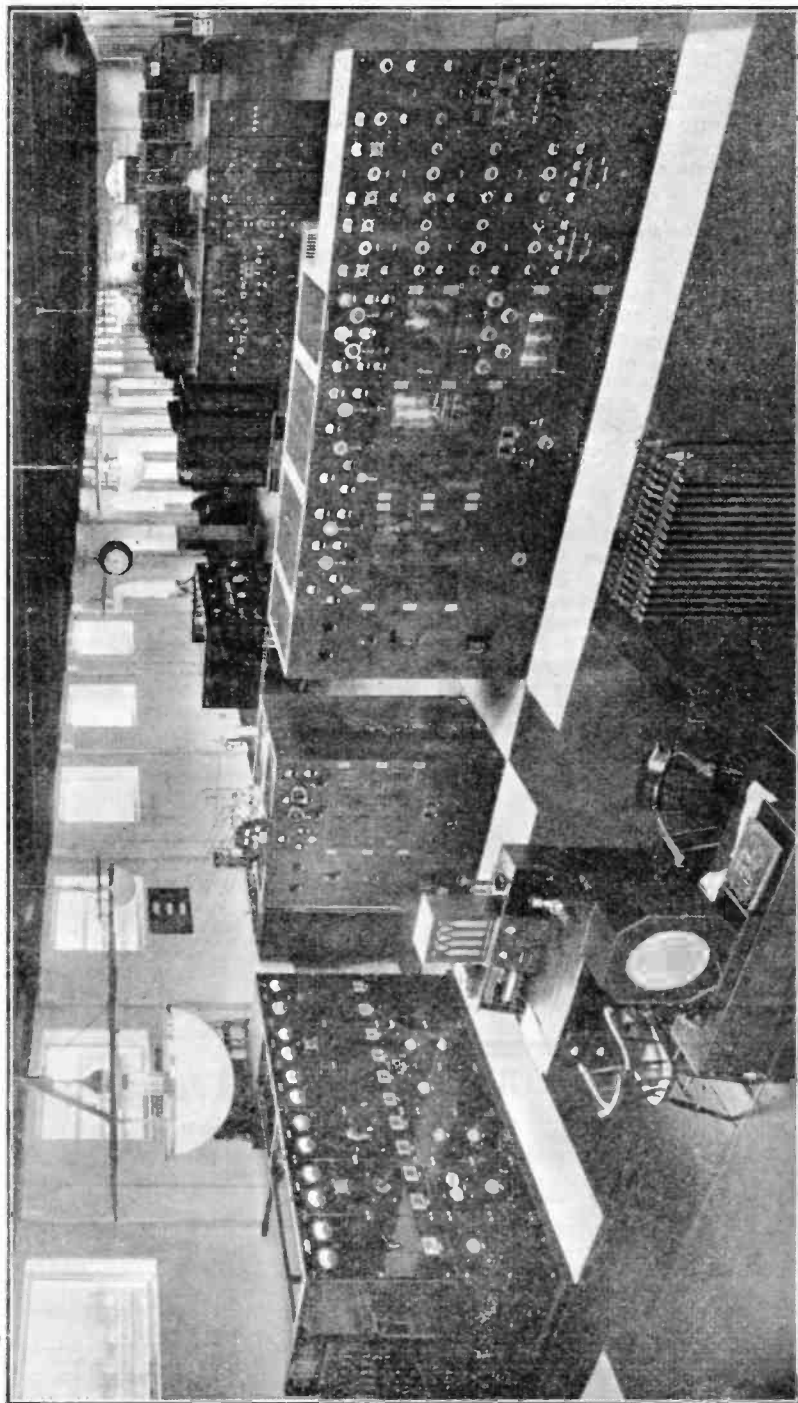
Station Description No. 3

A SITE for a radio station to provide world-wide coverage was chosen at Rugby as long ago as the early 1920's and a 350 kilowatt transmitter operating on 16 kcs. was put into operation in 1926. The rapid progress and development of short wave radio communication has resulted in a great expansion of equipment at this station and now, by means of the G.P.O. International Switchboard in London, the ordinary public telephone subscriber can be connected to the radio station and thence by short wave radio to almost any part of the world, the return circuit being via the receiving station at Baldock.

Direct point-to-point short wave telephone circuits are provided to Australia, Canada, South Africa, India, Egypt, Kenya, U.S.A., Bermuda, South America,

Portugal and Moscow. Telegraphic News Bulletins are broadcast daily to all parts of the world and to British ships at sea, and telegrams can be transmitted to ships in every part of the world. In addition to these services, time signals are transmitted from the Royal Observatory, Greenwich at 1000 and 1800 hours G.M.T. daily.

The radio station site covers an area of some 900 acres and is situated about 4 miles S.E. of Rugby. The station buildings consist of two groups, the Main Building and the Telephony Building. The former houses the three long wave transmitters, whilst the latter is devoted entirely to short wave equipment. Power for the whole station is normally obtained from the Leicestershire and Warwick Electric Power Co., Ltd., but a diesel generator is provided for emergencies.



General View of the Sender Room, Telephony Building.

There are thirteen short wave senders, two of them being single side band sets. They are all controlled by quartz oscillators installed in racks at the end of the transmitter room. Any oscillator can be coupled to any sender, by means of coaxial cable. The crystals are oven temperature controlled at 50 degrees C plus/minus 1 degree. The required harmonic is selected from the oscillator and fed to three R.F. amplifiers each using two valves in push-pull. The valves in the third stage are water cooled. The normal final amplifier has a power input of 60 kW and uses four 15 kW triode water-cooled valves in parallel push-pull. Some of the senders however, have two tetrode 60 kW demountable valves in push-pull. These latter valves are under continuous evacuation by two oil condensation pumps. This type of valve can be taken to pieces and filament or electrodes replaced when necessary. This demounting and reassembly takes about two hours. Bitumen is used for making the more permanent seals and special grease for the demountable seal. The seals are water cooled as are the anodes of these valves. The frequency range of these senders is from 4.0 to 21 Mcs., wave change being effected by changing the coil and a change of frequency can be made in a few minutes. Each sender has its own power supply. The H.T. of 10,000v. for the final amplifiers is obtained from rectifiers of either the cold cathode mercury pool, hot cathode mercury vapour or the hard thermionic valve types. The intermediate H.T. of 2,000v. and the bias and filament supplies are obtained from motor generators.

There are over 100 short wave aerials as well as the long wave aerial system. Out

of interest we may mention that the latter is supported on twelve steel masts, 820 feet in height, spaced $\frac{1}{4}$ mile apart. The aerial itself takes the form of an irregular octagon one end of which is open. The masts are triangular in section, being braced so as to make them thoroughly rigid. The base of each mast forms a tripod, the lower portion of which forms a ball and socket joint, permitting free movement of the mast on its base. The masts are insulated by porcelain and Swedish granite insulators. Each mast is supported by 15 wire stays and will withstand a wind of 140 m.p.h. An electric lift capable of carrying three persons is provided on each mast to facilitate maintenance work and inspection.

The short wave aerials are supported from steel towers 120 to 180 feet high. Various types are employed taking the form of beamed arrays and cage dipoles. The arrays are so arranged that the directivity of the beam produced is along the great circle path to the receiving station, and they are designed to give a narrow or wide beam depending on whether point-to-point or zonal coverage is required. The cage dipoles provide directional or omnidirectional aerials depending on the service area to be covered. In the case of some of the vertical dipoles where great height is required to sling them, they are hung from the long wave mast guys. The short wave aerials are fed by means of overhead transmission lines, which can be connected to any of the transmitters by a system of plugs and sockets.

Our cover photograph and those herewith, for which we are indebted to the G.P.O., show various views of the station equipment.

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- *Valveholder assemblies, comprising 5 Loktal 9-pin ceramic and 4 Amphenol I.O. valveholders, mounted on panel, 2/3 per assembly (postage 7d.)
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- *Beam power Loktal 3D6/1299A valves, 17/8 each.
- *Abbott TR4 Transreceivers, 2 only, complete with vibrator packs and spare transmitting valves, what offers ?
- .1mfd. 8000v. D.C. wkg. tubular wire and condensers, 20/- each.

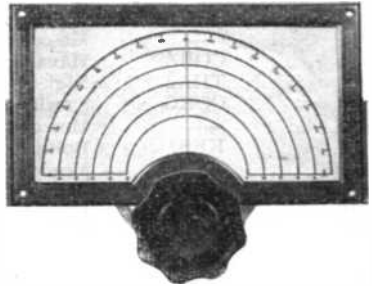
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73 es hpe CUL.



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BROADCASTING STATION LIST.

Part 5: 9320 - 7280 kcs.

THIS list has been compiled by the Signal Survey Section of the British Short-Wave League, and contains only stations that are operating on regular or irregular broadcasting schedules. Stations not in use, channels not in use at the time of going to press, and stations under construction are not included.

Frequency	Call	Location	Slogan	Power (watts)	
9320	...	—	Pavlovo, Bulgaria	" Radio Sofia "	1000
9315	...	LRS	Buenos Aires,		
			Argentine	Radio Splendid	5000
9295	...	WVLC	Manila, Phillipines	Voice of Freedom	5000
9290	...	HI2G	Cuidad Trujillo,		
			Dom. Rep.	Radio la Opinion	250
9280	...	KU5Q	Guam, Marianas	U.S. Navy Radio	2500
9273	...	COCX	Havana, Cuba	Casa Lavin	1000
9253	...	—	Bucharest, Rumania	Radio Dacia Romana	2000
9235	...	COBQ	Havana, Cuba		1000
9220	...	—	Omdurman, Sudan	Sudan Broadcasting Service	250
9210	...	OQ2RC	Leopoldville,		
			Bel. Congo	Radio Congolia	250
9185	...	HEF4	Berne, Switzerland	Radio Suisse	25000
9165	...	CR6RB	Benguella, Angola	Radio Club de Benguela	50
9135	...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
9125	...	—	Balikpapan,		
			Dutch Borneo	Radio Balikpapan	
9105	...	PJC1	Willemstad, Curacao	Radio Princess Juliana	3000
9100	...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
9080	...	CNR3	Rabat, Fr. Morocco	Radio Maroc	2000
9045	...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
9026	...	COBZ	Havana, Cuba	Radio Salas	1000
8960	...	THA2	Algiers, Algeria	Radio Algerie	10000
		COKG	Santiago, Cuba	Cadena Oriental de Radio	2400
8940	...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
8930	...	KES2	Bolinas, Calif.		
8910	...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
8840	...	FGA	Dakar, Senegal	Radio Dakar	300
8825	...	COCQ	Havana, Cuba	Cadena Oriental de Radio	5000
8820	...	RV64	Kharborovsk,		
			U.S.S.R.		
8800	...	—	Alma Ata, U.S.S.R.		
8760	...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
8700	...	COCO	Havana, Cuba	Radio America	2000
8664	...	COJK	Camaguey, Cuba		1000
8565	...	—	Munich, Germany	AFN	10000
8505	...	FGA	Dakar, Senegal	Radio Dakar	500
8500	...	—	Brazzaville, F.E.A.	Radio Club	600
8220	...	—	Scutari, Albania	Radio Shkroder	
8185	...	PSK	Rio de Janeiro,		
			Brazil		12000
8159	...	—	Bissau, Port. Guinée	Radio Bissau	50
8150	...	—	Funchal, Madeira	Radio Funchal	
8110	...	EPF	Teheran, Iran	Radio Teheran	14000
		XRSA	Sichang, China	Sichang Broadcasting Station	2000
8050	...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
8020	...	ODE	Beirut, Svria	Radio Levant	3000
8000	...	FIA	Douala, Camercons	Radio Cameroun	800

SHORT WAVE NEWS

<i>Frequency</i>	<i>Call-sign</i>	<i>Location</i>	<i>Slogan</i>	<i>Power (watts)</i>
7950 ...	—	Alicante, Spain	Radio Falange	1200
7940 ...	—	Santiago, Chile	Radio de Sociedad Anonima	
7937 ...	PSL	Rio de Janeiro, Brazil		12000
7875 ...	HC1CG	Quito, Ecuador	Radio Ecuador Amazonica	200
7863 ...	SUX	Cairo, Egypt	Radio Cairo	10000
7852 ...	ZAA	Tirana, Albania	Radio Tirana	3000
7805 ...	KNBA	Dixon, Calif.		50000
7790 ...	—	Stalinabad, U.S.S.R.		
7780 ...	JGF	Osaka, Japan		5000
7660 ...	YNDG	Leon, Nicaragua	La Voz de Leon	200
7650 ...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
7645 ...	KU5Q	Guam, Marianas	U.S. Navy Radio	2500
	EOU	Tokio, Japan		5000
7615 ...	YNLAT	Granada, Nicaragua	La Voz del Mombacho	200
7590 ...	—	San Remo, Italy	Radio San Remo	
	—	Ashkabad, U.S.S.R.		
7560 ...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
7558 ...	EAJ43	Santa Cruz, Canary Isles	Radio Club de Tenerife	1000
7552 ...	JLG4	Tokio, Japan		
7545 ...	RKI	Moscow, U.S.S.R.	Radio Centre Moscow	
7540 ...	FG8AH	Pointe-a-Pietre, Guadeloupe	Radio Guadeloupe	200
7530 ...	—	Macao, Port. China	Macao Radio Club	
7520 ...	XRSA	Sichang, China	Sichang Broadcasting Station	2000
7510 ...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
	JVP	Tokio, Japan		10000
7502 ...	YNFT	Granada, Nicaragua	La Voz de la Sultana	100
7500 ...	XNCR	Yenan, China		
7489 ...	—	Tiflis, U.S.S.R.		
7480 ...	—	Jaffa, Palestine	El Shara al Adna	
7461 ...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
7460 ...	LZB	Sofia, Bulgaria	Radio Sofia	
7448 ...	—	Bukit Tinggi, Sumatra		
7430 ...	—	Leningrad, U.S.S.R.		
7410 ...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
7405 ...	—	Daventry, England		
7390 ...	—	Berne, Switzerland	Radio Suisse	25000
7380 ...	HEK3	Berne, Switzerland	Radio Suisse	25000
7360 ...	HET3	Berne, Switzerland	Radio Suisse	25000
	RWG	Moscow, U.S.S.R.	Radio Centre Moscow	
7350 ...	HC2DC	Guayaquil, Ecuador	Radiodifusora Cenit	130
7330 ...	—	Moscow, U.S.S.R.	Radio Centre Moscow	
7320 ...	GRJ	Daventry, England		50000/100000
7315 ...	YSO	San Salvador, El Salvador	La Voz de la Democracia	1000
7312 ...	—	Salisbury, S. Rhodesia		
7300 ...	—	Brussels, Belgium	Radio National Belge	5000
	—	Moscow, U.S.S.R.	Radio Centre Moscow	
	VIG	Port Moresby, Papua		
7295 ...	ZOY	Accra, Gold Coast		5000
	—	Athens, Greece		
7290 ...	VUD2	Delhi, India	All India Radio	10000
	VUD3	Delhi, India	All India Radio	5000
	VUD11	Delhi, India	All India Radio	20000
	—	Labuan, North Borneo	Radio Labuan	
7285 ...	JLG	Tokio Japan		20000
7280 ...	GWN	Daventry, England		50000/100000
	VLC8	Shepparton, Australia	Radio Australia	50000

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Raymart Short Wave Ceramic Tuning Condensers—with brass vanes and extension spindle for ganging. Standard—15mmfd. 3/3; 40mmfd. 3/6; 100mmfd. 4/3; 160mmfd. 5/3; 250mmfd. 6/3. Double spaced 20mmfd. 3/9. Midget—15mmfd. 3/3; 60mmfd. 3/9. Double spaced Midget—5mmfd. 3/3; 15mmfd. 3/6.

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Meters—A full range of Meters by Measuring Instruments (Pullin) Ltd., including 1 mA. Foundation Unit for Multi-range Test Meter.—£4 9s.

Wire. Enamelled Copper Wire—per ¼-lb. Coils. 12 and 14 s.w.g.—1/8; 16 and 18 s.w.g.—1/9; 20 s.w.g.—1/10; 22 s.w.g.—2/-; 14 s.w.g. x 75ft.—3/6; 14 s.w.g. x 100ft.—4/6; 14 s.w.g. x 140ft.—6/3.

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Club News of the Month.

BRITISH SHORT WAVE LEAGUE

Birmingham Chapter :

The Birmingham and District Short Wave Society is now meeting on the first Monday of each month at the "Hope and Anchor" Hotel, Edmund Street. The date for the August meeting, however, is fixed for the 12th, the second Monday of the month. A 'phone DX competition (all bands) will be held on July 6th-7th, with July 10th as an alternative date for members unable to listen on the original dates.

Secretary : G. Hodgkiss, BSWL 1938, 30 Townyn Road, Moseley, Birmingham, 13.

Kendal Chapter :

Good progress is reported from this newly-formed Chapter, many new members having been enrolled during the past month. Local readers are invited to contact the Secretary : G. R. Whiteside, 9 Aynam Road, Kendal. ('phone Kendal 85)

London Chapter :

Meetings are now being held every Tuesday, 7.30-9.30 p.m., at Senior Street School, Paddington, W.9. An open invitation is extended to London readers to attend these gatherings. Further details may be had from : N. Stevens, BSWL 1039, 53 Madeley Road, Ealing, London, W.5.

General :

The League's QSL Bureau is now handling OUTGOING as well as incoming cards.

The annual subscription for this service is only 1/6 which we feel is most reasonable.

Amongst the latest new appointments are G. H. Littlestone, BSWL 2142, as Publicity Manager, and J. Beaunoir, BSWL 2208, as Representative for Natal and Zululand.

GRAFTON RADIO SOCIETY

Two interesting lectures have been given by G5GQ on the progress of transmitting and receiving since 1918, and by G8DF on Procedure and Principles of radio transmitting. SP1HH, late of the Polish Forces, exhibited a miniature transmitter and receiver for operation on 300 Mcs.

The society's TX is now under construction, and G8DF is supervising the building of a superhet for the club's use.

Secretary : W. H. C. Jennings, A.M.I.R.E., 82 Craven Park Road, London, N.15.

SLADE RADIO SOCIETY

At the last meeting, Mr. Jones of Messrs. Wilkins and Wright gave a talk and demonstration of the "coil" pickup. The lecturer played a number of records to support his claims and the quality of the reproduction was such as to make the statements appear very modest. The overall response was very good, and it was felt that Mr. Jones had really achieved something worth doing.

The membership of the society is continuing in strength and application will be made for a portable licence for D.F. work.

Secretary : L. A. Griffiths, 47 Welwyndale Road, Sutton Coldfield, Birmingham.

SOUTH SHIELDS

AMATEUR RADIO CLUB

The above club has resumed activities again and a most interesting programme has been mapped out for the forthcoming meeting nights. So far demonstrations and lectures have been given by Messrs. J. Teasdale, G8VV, and F. Boad, G8IF.

The meetings are held in the St. Paul's School rooms every Friday evening commencing at 7 p.m. The first hour is devoted to morse practice and instruction.

All who are interested in the meetings are assured of a warm welcome.

Secretary : W. Bennell, 12 South Frederick Street, South Shields.

WHITEFIELD AND DISTRICT RADIO SOCIETY

This society is now holding regular weekly meetings every Monday evening at 7.30 at the Stand Grammar School, Higher Lane, Whitefield. Amateur transmitting facilities are to be provided in the near future by the newly appointed Technical Advisor, Mr. G. H. Vickers (G8GV), and regular morse classes are held from 7.30-8.0. At the recent General Meeting on May 20th, the following officers were elected :—

Chairman : R. Lawton; Hon. Secretary : E. Fearn; Hon. Treasurer : R. Purcell; Technical Advisor : G. H. Vickers, G8GV.

All radio amateurs, experimenters, and, in fact, anyone interested in any aspect of amateur radio will be warmly welcomed.

Secretary : E. Fearn, 4 Partington Street, Newton Heath, Manchester, 10.

On the Ham Bands.

Conducted by "CQ"

The New Bands

BY the time you read this article, the 14 and 7 Mcs. bands, though in a rationed condition, will be open to G stations. All the hams in my district are sinking their hard-earned pennies in myriads of crystals, chassis, valves, etc. From conversations heard on the air, it appears that the bands will be full of 150-watters. May I address a few words to these QRO operators? They are simply—remember your less fortunate colleagues (the 25-watt brigade) and please don't run your full power on purely local contacts. Just think what we used to do on only 10 watts!

Top Band

It is worth noting that this band has proved to be the most interesting one during the past month, with plenty of DX being worked with the lowest of power. QRN has, however, been very troublesome, especially during the Whitsun V-holiday period. During these few days occurred the worst spell of QRN that I have ever heard, and friends tell me that it was the most intensive they have experienced for twenty years. There was one continuous roar, with occasional peaks of really heavy noise. The roar was undoubtedly due to "brush discharge" from the electrified clouds. Another unusual phenomena was the minute charges given up by the static present in the raindrops as they hit the aerial. Frying oil describes it nicely!

Regarding the standard of operating on the band, I have found it to be generally good, especially noticeable being the operating of the ex-AA fraternity. Telephony operation, I fear, does not seem to

come up to the same standard as CW, although some really fine transmissions have been heard. One nasty habit that gets under my skin is that of a CW "operator" who comes on the air and plays with the key for what seems an eternity, usually right on top of some unfortunate station. If this sort of thing is really necessary then why don't these ethereal twitters move up to 1.9-2 Mcs., where there is plenty of room for their diverting pastime.

7 Mcs.

Not much news from this band, although some DX is still coming through most evenings. How about some news of DX heard from some of you midnight-oil burners?

14 Mcs.

The band is still very lively, with hordes of Latins coming through. Several very interesting stations have recently been heard, perhaps the most exciting being FO8FN in Buna Buna, Society Islands. This station is operated by an American ham and can be heard most mornings, either on 'phone or CW, around 0730. He has a regular schedule with TI2RC. Another interesting station is AC3SS, heard by many listeners, which is situated at Gangtok, Sikkim, in the Himalayas. Although this station is signing with a Tibetan call, it is actually in India! Country collectors please note!

D. L. McLean sends in a good log, the best features being TI4JG, the usual run of Latins, and ZCIAR. The latter station is in Transjordan and is another to add to the list of stations operated by British service personnel. Heard at 2130.



A couple of rare cards, recently received by G6DH.

A. Hamilton, BSWL 24 (London, N.W.6.) has heard some interesting signals. These include PZ1A (2200), CP1UU, TI4AC, TI5EP, XE1CA, CR9AG (559 at 2130), YS3AG, etc.

From Brentford (Middlesex) comes the log of J. Clarke who reports hearing VR5BY (449 at 2130), OQ5AQ, OQ5BR, XE1GG, VS1AH, HC2OS (2230), on CW and VS1BC, CP5EA (2300), YN1LB, HK5EE on 'phone.

A number of readers have queried ZK1AA. Well, we don't quite know . . ! He is in the Call Book, but we will recollect that before the war this call used to pop up quite frequently usually at the wrong hour and at R9! Since most reports speak of R9 signals we feel that this call should not be taken too seriously!

28 Mcs.

Although generally "continental" conditions prevailed throughout the month, the band has had its moments. One of these has been the appearance of VK2NO on numerous mornings around 0800-1000. Geoff. Johnson, G2BBJY sends in his usual detailed reports, and we resume his notes where we left off last month. May 19t was very poor, the only DX heard being VQ6MI (348) and ZS1BM (349). At about 1500 the band suddenly became alive with short skip stations, most of them from France, Germany and Switzerland. In addition ZE2JD (337) was logged. Between May 20th and June 15th, conditions were very spasmodic with occasional short skip and DX. Some of the more interesting signals heard were ZB2A (Q4 R6), PY1DH (338), LU3AS (449), PY6AG (449), VQ2BI (459), VQ2WP (449), Y12XG (459), PY1QB (579), and PY2AG (Q4 R4). Many queer ones were logged including the amazing call of IP1MF! Another was ES1CM who sounds very doubtful.

June 16th was a splendid day for short skip, F8BS and OZ4RB being worked, and literally dozens of stations logged.

D. Heightman, G6DH continues his excellent DX record by working Y12XG, Y12CA, ZS6CZ, OQ5BL, ZS6ID, VQ2FR, PK4DA, VK2GU, W4FT, SU1KE, SU1MW, SU1CX, SU1RC, and 18 Europeans. In the lengthy "calls heard" section of the log we note XZ2DN, VS1BA, XZ2AB, W3GZT/J, VQ4MNS, VQ4ERR, ZE1JU, KA1AE, VP3CF, VP6PC, ZD4AC, KP4AV, ZS's 1AX, 1T, 2CB, 4AF, 6DS, 6ID, and many LU, PY, etc. Whew !!

L. Howes reports CE1AO, VO1P, VO2KJ, VQ3TOM, ZE1JJ, CO2BX and PJ3X.

D. L. McLean was lucky with the W's, reporting very many calls, in addition to hearing various Europeans, ZB2A, XAZL and W1JTK/SV.

Voice Control

A single channel two-way 'phone system has recently been tested by G2OR and G2YH. In this system the actual modulation controls the carrier, so that the carrier is only present when the operator is speaking. Originally an American idea, it is pleasing to listen to this keen pair testing the system, which has so many obvious advantages on our bands that are so overcrowded. Incidentally, 2YH is using an eight-foot vertical on top band and does exceedingly well.

Markers for 14 Mcs. 20-

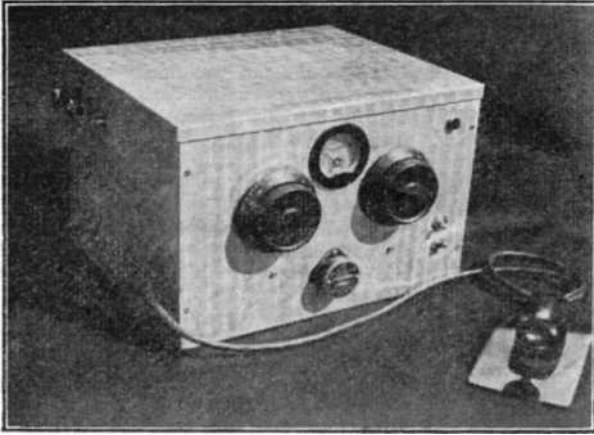
For those about to calibrate their receivers for the 14 Mcs. band, the following list of commercial W/T stations will be useful:—

- | | |
|-------------------|-------------------|
| NPG - 13800 kcs. | GBA2 - 13990 kcs. |
| HRX7 - 13900 kcs. | ZNP - 14270 kcs. |
| WQS - 13915 kcs. | RMP - 14400 kcs. |
| VIS2 - 13945 kcs. | LQR3 - 14435 kcs. |
| RCE - 13960 kcs. | NPM - 14500 kcs. |
| GYZ4 - 13975 kcs. | LSM2 - 14500 kcs. |
| LCO - 13985 kcs. | XDA - 14525 kcs. |

Reports Wanted

The following stations invite reception reports of a constructive nature on their signals. Frequencies are given where known. We will be pleased to publish details of any station requiring reports, and will make this a regular feature.

- G2ATV: 1819 kcs. and 2000 kcs.: CW: Via "Short Wave News."
 G2UK: 1883 kcs.: CW: Via "Short Wave News."
 G2CCB: 28 Mcs., 60 Mcs. and 1.8 Mcs.: CW: Reports for 1.8 Mcs. to be any distance over 200 miles: 15 National Avenue, Hull.
 G3IS: 58.76 Mcs.: CW: 59, Eastlands Road, Rugby.
 G3XV: 1883 kcs.: CW: "Sunny Cottage," Donnington Wood, Wellington, Salop.
 G2DAN: 1903 kcs. and 1915 kcs.: CW: "Dalbrae," Beacon Hill, Rolleston, near Burton-on-Trent.



A Stand-by Top-Band TX

By G2UK

WHEN the news was released that the "top band" was open for amateur transmission, this little transmitter was hastily built up from spare parts around the shack. It was meant to be a temporary job only, but has been giving such good results, that it will certainly become a permanent unit of the shack equipment.

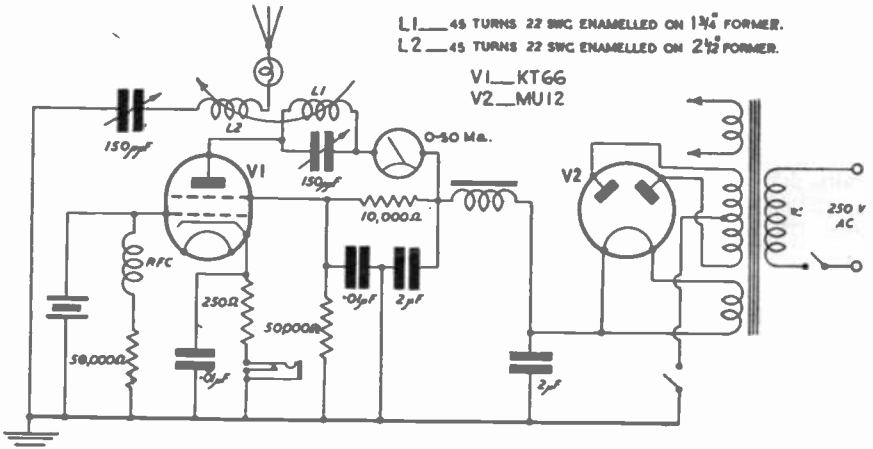
The circuit diagram is self-explanatory. The valve is a KT66. The two tuning capacitors are old receiving types; C1 has to be insulated from the cabinet, which contains both the transmitter and its power supply. The latter is provided by a 350-0-350 volt, 100 mA. transformer, with two four-volt filament windings. The coils L1 and L2 are wound on two lengths of ebonite tubing. L1 is fixed to the side of the cabinet on stand-off insulators, whilst

L2 is mounted so that its position with regard to L1 can be varied, thus providing a variable coupling between the tank coil and the aerial coupling coil.

The only point needing comment is the aerial system. A 66 ft. end-on aerial was the only one available, so this was coupled to the tank coil by a coupling coil of 45 turns of enamelled 22 S.W.G. copper wire on a 2½-inch former. This inductance is tuned by a .00015 mfd. tuning capacitor connected between it and earth, thus providing a Marconi aerial system.

The transmitter is tuned by rotating C1 until a dip is indicated on the meter. A 6 volt flash lamp bulb is connected between the aerial and the coupling coil and C2 tuned until it glows at a maximum. The coupling between L1 and L2 should

(Cont. on page 188)



V.H.F. NEWS

Temperature Inversions.

THOSE who follow 60 Mcs. news closely, will have noticed that the term "temperature inversion" is appearing more and more frequently as the suggested cause of much of the "greater than optical range" contacts which have been made recently.

The V.H.F. radio waves are refracted and reflected when they encounter a layer of air with a different "dielectric constant" than that in which they are travelling. The dielectric constant of air depends on its temperature, its water vapour content and so on, so if a wave from a V.H.F. transmitter meets a mass of air at a different temperature or containing more or less water vapour than the air in which it originated, it may be bent sufficiently to return to earth, so that contacts over considerable distances become possible.

The troposphere is that part of the atmosphere in which the temperature normally falls with increase in height. It extends from the ground to about 9 miles up. Above it is the stratosphere, where there is practically no temperature change with increasing height. It is in the troposphere that many of the changes responsible for our weather occur. Here masses of air, thousands of tons in weight, covering areas extending for hundreds of miles, are moved and tumbled about by the atmospheric circulation. These masses of air retain their characteristics (temperature, water vapour content, etc.) for some time, so that as they move about, they come up against other masses of air of differing characteristics. When one mass of air comes up against another, a more or less well-defined boundary exists between the two—for a time at any rate, until the masses have become intimately mixed together. These boundaries are termed *fronts* by meteorologists.

From what has been said, it will be obvious that these fronts also separate air of one dielectric constant from air of another, so that if our VHF waves meet a front, they may be either refracted or reflected.

One of the most frequent causes of these fronts is the condition known as a *temperature inversion*. In clear, still conditions, with every 1000 feet rise in altitude, the temperature of the atmosphere falls on the average 3.6 degrees F. Should a mass

of warm air meet a mass of colder air, the warm air being the lighter, will override the cold air. If a recording thermometer is sent up on a balloon or aircraft, the normal drop in temperature will first be recorded until the top of the cold air mass is reached and then, as the thermometer enters the warm air, it will show a rapid rise. The boundary between the two layers is a front and the phenomenon is spoken of as a *temperature inversion*.

Temperature inversions are most frequent over continents during the winter time and over oceans and oceanic islands in the summer and they are particularly common along sea coasts due to the action of on-shore and off-shore breezes. Over land areas a daily temperature inversion occurs each morning and evening. Heat is lost from the ground during the night and the air over it cools, leaving the air above relatively warm. During the day the ground warms up again, heating up the air in contact with it. This effect is most noticeable during clear cloudless periods. The temperature inversion is most pronounced in the late evening—and it is interesting to note that much of the recent 60 Mcs. "DX" of the "several hundred mile" variety has been made about this time. There are a number of ways in which a temperature inversion can occur. One often occurs over a layer of fog. A meteorological expedition in the ship *Scotia* recorded a temperature of 21.5 degrees C. at 3450 feet with a sea surface temperature of 4 degrees C. during a fog off the coast of Newfoundland and pre-war 56 Mcs. workers reported that conditions were often good during foggy weather. A completely overcast sky may give a temperature inversion above it as the layer of air above becomes heated by the sun's rays. It is interesting to note that temperature inversions were first investigated by radio waves. A wave length of 120 metres was used and the time taken for their return used to calculate the height of the inversion—in much the same way as was done in ionospheric research.

As would be expected, waves propagated in the troposphere are characterised by rapid fading and by conditions changing from hour to hour. The distances covered are of the order of 50 to 400 miles and the

rapidly-changing angles which the fronts make with the horizon, suggest that one really ought to have a beam aerial variable in the vertical plane as well as in the horizontal. The beam should be a sharp one for work of this type and a sensitive receiver is required.

The Month's News

G5BD and G5LL of Mablethorpe, Lincs., hit the headlines this month. On June 3rd at 1815, G5BD heard F3JB in phone contact with G6CW. He called him and established contact, thus making his first 60 Mcs. contact of more than local distance. F3JB was also heard by G6DH. On June 4th, G5LL worked I1FA and F3JB at 1715, making his first "DX" contacts on 60 Mcs. On Sunday, June 6th, more DX was worked by 5LL when he contacted I1AY at 1400. When 5BD worked F3JB, short skip existed on 28 Mcs., several OZ stations being audible. One interesting point is that these continental contacts are the first "DX" the Lincolnshire lads have made. Apart from hearing G6VX, they have heard no "DX" G signals. Both 5LL and 5BD are using similar RX's, except that 5LL uses Red E valves whilst 5BD uses acorns. Both stations are using 66 ft. long wire aerials. 5BD remarks that from observations he has made, it would seem that a beam is needed to work G's whereas a long wire is best for the continental DX. This bears out the general opinion that a beam is best for tropospheric work, whereas the long wire, being more or less omnidirectional, is better for "sporadic E" working.

G5BY, G5MQ and G6CW have continued long wire aerials. 5BD remarks that working "outside G" contacts. G5BY, S. Devon, worked I1FA (telephony, 5BY's sigs. Q5, R7; I1FA's Q5, R9); I1AY ('phone, Q5, R9/Q5, R7); F3JB ('phone, Q5, R9/Q5, R9); and I1FA ('phone, Q5, R9/Q5, R9) between 1600 and 1730 on May 19th. On the 20th, at 1730 he worked F3JB again on 'phone (Q5, R9/Q5, R9). F3JB is in Bandol, S. France. Note the high R strengths reported. Between 21st May and the 14th June, no "outside G" contacts were made, but 24 G contacts were had. These all occurred between 2000 and 2200, and the average of these contacts works out at 559/449. QSB was reported on one-third of the contacts. The wind was from the S. or S.W. during most of the period and of low velocity—3.15 m.p.h. The barometer remained steady at 29.37 inches to 30.30 inches. Sky varied from rain to sunny intervals.

G5MQ, Woolton, Liverpool, worked I1IRA, Novano, Italy ('phone, Q5, R9/Q5, 186

R7) at 1640 and F3JB (579/ICW R8) at 1710 on May 19th. Between 1st May and 4th June, 55 "inter G" QSO's were made. QSB was reported on many of these and the average strength of the total works out at 569/559. These contacts were made between 0645 and 0700 and between 1945 and 2245—the peak periods for tropospheric propagation.

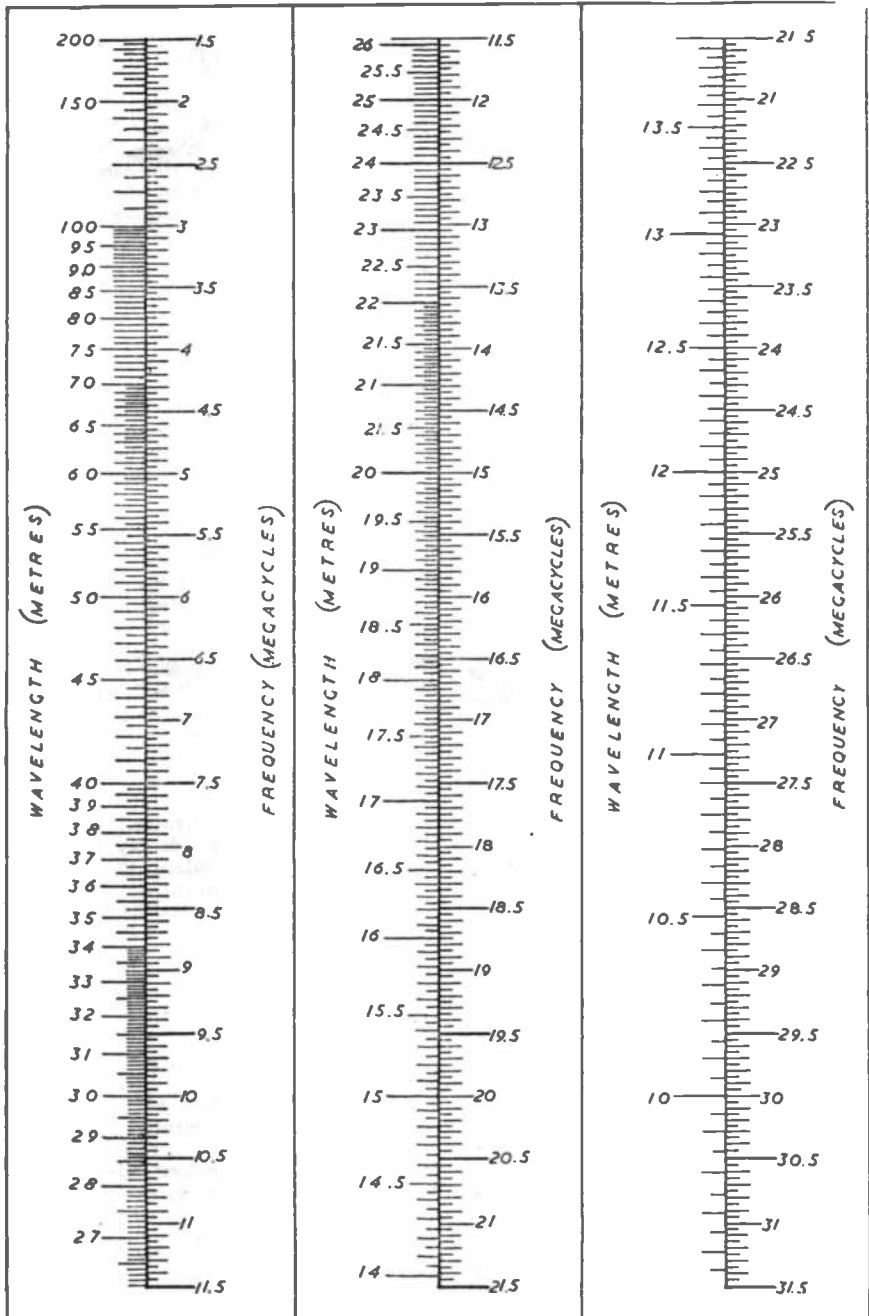
G6CW, Bramcote Lane, Wollaton, Notts., worked F3JB at 1900 on June 3rd (Q5, R9). He worked F3JB again at 1815 on June 4th. On June 16th, he worked I1BR, near Naples, at 1400 (QR, R9). Note again the time which these "outside G" contacts were made. Between May 18th and June 16th, 30 "inter G" contacts were made, at times varying between 2140 and 2300. It is really fascinating analysing these logs. You can run your finger down the G.M.T. column and sort out the "inter G" and the "outside G" contacts without seeing the call column of the log—just by noticing the time at which the contacts were made! G6CW reports "local" (i.e., short skip) conditions on 28 Mcs. at the time of the F3JB and the I1BR contacts. QSB is reported on many of the "inter G" contacts and the average signal strength for the period of these QSO's works out at 459.

BSWL 24 reports the reception of:—G2AAN, BMZ, CY, FWA, LC, MC, MR, NH, QY, UA and XC. G3CQ, CU, FD, FU, KP, NR, OO, PW and WS. G4CG, CI and IG. G5AS, BY, CD, DT, FK, KH, MA, OO, RP, TP, TX, VB and WP. G6AU, CW, FO, KB, LK, OH, RA, VA, VX, UH, YP and YU. G8BD, CK, DV, GX, IG, RS and SK. A pretty good log! We're wondering whether some of the tenmetre boys might not do well to peruse it!! BSWL 24 reports hearing G5TX and G6LK saying they had heard OKIAA on "five."

G3IS, Rugby, has worked a number of G's between June 6th and 13th. He includes barometric pressures for the period and these were pretty steady between 29.50 inches and 30.15 inches.

Activity at G8RS, Reading, has been at a low ebb during the month, but, he too, notes the QSB on the QSO's he has had. Summing up the month's activities, we may say that activity is at a pretty high level, that many QSO's in excess of optical range were worked and that these were characterised by all being worked in the early morning or late evening, that they were of comparatively low signal strength (compared with the sporadic E contacts) and that QSB was a marked feature of

(Cont. on page 188)



FREQUENCY/WAVELENGTH

CONVERSION

CHART

SHORT WAVE NEWS COPYRIGHT

SHORT ENDS

Slogan

One of our regular readers suggested we adopt the slogan "No News is Bad News"! No comments!

Coming Shortly!

Another correspondent has raised the question of listeners' reports to short wave stations, and the question of QSL's. Now that amateur transmitting is firmly established once again we feel this subject is of considerable importance. Accordingly our Assistant Editor will deal with this question in a short series of articles, commencing with the next issue. Norman Stevens is also Honorary Editor of the British Short Wave League's "Review" and has been a prominent official of that organisation for a number of years. He is, therefore, well able to give good advice on this controversial topic.

Something New

Apropos of the preceding paragraph, we are pleased to announce advance details of an item of interest to all SWL's, the "Short Wave News" Station Reporting Pad. Each pad will contain 50 sheets, quarto size, ready ruled and printed to allow the preparation of a fully detailed reception report. Full instructions on the correct use of the report sheets will be provided. Further details including an illustration of a sample page, will appear in our next issue.

Puzzle Corner

The other day we heard a G on top band 'phone who said he was using two 807's in push-pull. Said he was running 'em at "just under ten watts"! Puzzle is how many No. 8 batteries are used to supply the H.T. !!

(TOP BAND TX—Cont. from page 184)

not be too tight or the note may be chirpy.

In spite of the poor aerial, over a hundred different top band stations have been contacted during recent weeks, many of them over the 100 mile range. The best DX to date is GM4GK—over 250 miles from the writer's station. These contacts have been made with a Type P.5 Q.C.C. crystal, which gives about 5 watts input R.F. A further series of tests is being planned using one of Q.C.C.'s Type Q.5 crystals which will give a full ten watts of R.F. with the valve specified.

Obituary.

Mr. John L. Baird

THE death of Baird of television fame has recently been reported. He was born in 1888 at Helensburgh, Scotland; and was the son of the minister of the church there. He won a scholarship in electrical engineering at the Royal Technical College, Glasgow, and continued his education at Glasgow University. The possibility of "seeing by wireless" had intrigued him since his boyhood days and when, at the age of 18 years, poor health compelled him to give up business in London, he went to live in Hastings and there set up his first laboratory. His first primitive apparatus made from old bicycle parts, bull's eye lenses and cut-up tins, enabled him to reproduce the form of objects. On October 2nd, 1925, he successfully transmitted a recognisable image from his attic laboratory to a receiver in an adjoining room. In 1926 he demonstrated the transmission of clear pictures of the human face before the Royal Institution. Publicity came to his discovery in 1929, when the German Post Office broadcast television used his system, and in this country a few months later when the B.B.C. also used it.

As many readers will remember, the first Baird television receivers used a neon tube as a source of illumination. In 1931, the first big step forward took place with the development of the modulated arc which gave much brighter pictures. Eventually Baird adopted the cathode ray tube which has now become standard in most television receiving equipment.

Baird has been described as an inventor who did not get "the lucky breaks." This no doubt refers to the fact that at first the B.B.C. used both his and the Marconi-E.M.I. systems. The Television Advisory Committee decided that only the latter system should be continued, so that Baird's method lost the backing it might have had. This did not daunt him from continuing his work and in 1939 he demonstrated colour television. A feature of his system was that the pictures were shown on a screen, and even his colour television gave a picture some two feet square. A running commentary of a "big screen" Baird television demonstration organised by his Company, of the Victory Parade, was telephoned to him on Victory Day as he was too ill to attend in person.

One of his best friends and backers was Mr. Jack Buchanan, the actor-manager, who has been a close friend since their schoolboy days.

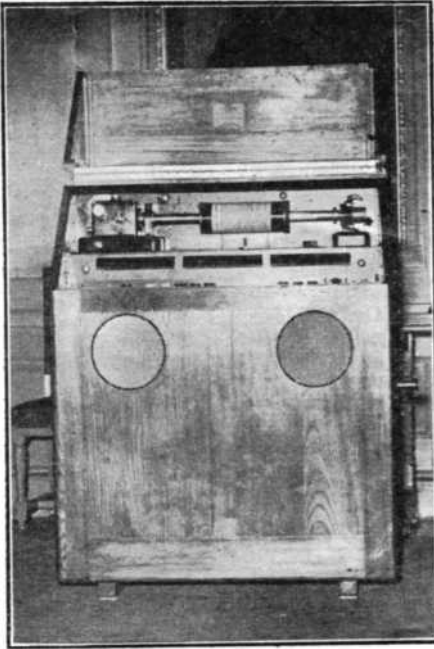


PHOTO- TELEGRAMS

Cable and Wireless Ltd.'s
New Service

THE first photographs to be transmitted by wireless were exchanged between Britain and the U.S.A. in 1926. Since then great progress has been made in this field of telecommunication and we illustrate above part of the latest equipment developed by Cable and Wireless Ltd. for their phototelegram service which has enabled great reductions in charges to be made. During the latest stages of the war, Cable and Wireless Ltd. handled up to 2000 official radio pictures a month, and the recent price reductions will enable the general public, business men and the Press to enjoy the benefits of this service on a similar scale.

Thirteen circuits are in use between various parts of the Empire and foreign countries. Direct circuits exist between London and Montreal, Capetown, Melbourne, Bombay, Colombo, New York, Buenos Aires, Moscow, Stockholm, Berne, Cairo and Vienna.

In May, 1941, the whole of the phototelegraphic apparatus in London was destroyed by enemy action. Equipment was gathered together from various sources including the Post Office and the "Daily Mail" and in three months the service was back on the air. Several very interesting extra services were operated at times during the war. For instance, mobile equipment

was carried on the "Blue Train"—the mobile wireless unit which followed the armies from Rome until the surrender. Phototelegraphic apparatus was also included amongst the equipment which was fitted on the deck of a converted landing craft in Colombo and followed the British Fleet into Singapore Harbour. This ship-station is now being operated from the Company's recovered offices in Singapore City.

A good deal of progress in actual technique has been made during the war. Transmission is now three times speedier, the time taken to transmit a picture 10 by 6 inches varying from 6 to 10 minutes. The photograph for transmission is fixed round a rotating cylinder. As the cylinder revolves, a ray of light travels across it from end to end, thus covering the whole of the picture. The reflections from this light ray vary in intensity with the variations in light and shade of the original. This varying light beam is made to modulate the transmitter via a photoelectric cell. At the receiving end, the radio impulses are converted back into a fluctuating light ray, which is directed on to a sensitized photographic film fitted on to a cylinder revolving in step with the one at the transmitter. This cylinder, of course, revolves in the dark and when the light ray has travelled all over the film, it is removed and developed as in normal photography, when any number of prints can be made from it.

(V.H.F. NEWS—Cont. from page 184)

many of the QSO's. These characteristics label the signals as being those propagated through the troposphere. Information regarding temperature inversions is not to hand, but the occurrence of these contacts in the morning and evenings correlates with the normal diurnal temperature inversion. A very interesting feature is that most of the activity seems to have been in the west and south coastal zones. The prevailing wind throughout the period has been S. to SW., and rain has been a feature of most of the period under review. The last period during which a N. or NE. wind blew was during May, and G6DH reports that conditions are very good at his station on the East Coast during N. and NE. winds. Recently, conditions have been very poor for him. Do the winds bring the moisture in from the sea, thus setting up conditions suitable for refraction to take place?

During the period under review, a number of Continental stations have been worked. These have been worked on chance occasions only and signal strengths have been high. They have been associated with short skip conditions on 28 Mcs. and are no doubt themselves due to ionospheric propagation.

Television Signals.

Two instances of freak television reception have been reported. On June 10th, the Victory Day programme was received at Minehead—170 miles, and on June 17th, good reception was obtained 199 miles away at Torquay.

From Our Mailbag.

Dear Sirs,

I would like to thank you for starting your series of ABAC's, and think that an article on the ideal report from a station's point of view would be greatly appreciated by beginners like myself.

Yours truly,

G. Rawnsley, BSWL 1851 (Huddersfield)

(We have had many letters of a similar nature. See this month's "Short Ends"—Ed.)

Dear Sir,

The enclosed note on "Amateur Enthusiasts in Greece" is forwarded for publication in "Short Wave News" should space occur.

The mag. is the thing now needed! Hope the paper supply will soon allow a real good and lengthy monthly.

Best wishes,

Stanley Gow, ex-XABR

Kingsbury, N.W.9.)

(The notes referred to will appear in our next number. Regarding the paper supply, we are keeping our fingers crossed! —Ed.)

Dear Sirs,

Thanks for a really good short wave monthly. . . . I hope you print an index at the end of the year as I intend binding all my copies.

J. Taylor, BSWL 2126 (Grantham).

(We are making enquiries and are hopeful that we will be able to offer spring binders at the end of the year. We shall certainly print an index—Ed.)

THE RADIO AMATEURS' EXAMINATION

At the request of the City and Guilds of London Institute, we have refrained from publishing the first paper set for the Radio Amateurs' Examination until official sanction was received. Authorisation to publish the paper has just been received and we reproduce the complete paper below:—

1. A 100-ohm resistor and a 300-ohm resistor are joined in parallel and connected to a battery of e.m.f. 7.5 volts and negligible internal resistance—

(a) What is the total current taken from the battery?

(b) What power is dissipated in the 100-ohm resistor? (10 marks.)

2. What do you understand by the term "resonance"? If an inductance of 100uH is connected in parallel with a capacitance of 100uuF, what is the resonant frequency of the circuit? (10 marks.)

3. Draw a diagram of a self-oscillating valve circuit and explain simply its method of functioning. (10 marks.)

4. Why are quartz crystals frequently used in radio transmitters? Describe, with diagram, a typical crystal-controlled oscillator. (10 marks.)

5. Explain why "standing waves" are undesirable in a feeder system connecting a transmitter to an aerial. How would you detect their presence and minimise them? (10 marks.)

6. Describe an "artificial aerial." How can an "artificial aerial" be used to measure the power output of a transmitter? (10 marks.)

7. In what ways may a low-power transmitter interfere with radio and television reception? What precautions should be taken to minimise such interference? (20 marks.)

8. What are the conditions laid down by the Postmaster-General for the frequency measurement and control of amateur transmissions? (20 marks.)



The S.T.C. 5C/100-A Beam Tetrode.

Component Review.

STANDARD TELEPHONES AND CABLES LIMITED

with a Thoriated Tungsten filament and has an American giant 7-pin base. It is both electrically and mechanically an equivalent of the RCA 813 valve, brief details being as follows:—

Filament voltage 10 volts at 12.5 amps.

Maximum anode dissipation 100 watts.

Maximum direct anode voltage 2,000 volts, anode current 200 mA.

5B/250-A.

This valve is an exact equivalent of the popular 807, and is ideal for 25 watt operation. It is a Beam Tetrode and can be operated on frequencies of up to 60 Mcs. at full ratings. The valve is fitted with an American 5-pin ceramic base, the anode being brought out to a top cap. The valve is moderately priced, but by reason of the fact that it can be used in receiving equipment, is subject to Purchase Tax.

4356-A.

This is an R.F. Triode for operation at frequencies of up to 100 Mcs. at full ratings, and is an equivalent of the American 356-A. It is fitted with a Thoriated Tungsten filament rated at 5 volts 5 amps., and has exceptionally low inter-electrode capacities. The maximum anode dissipation is 50 watts and a power output of 88 watts in a Class C.P.A. circuit subjected to anode modulation.

22V/310-A.

This valve is a full wave Mercury Vapour Rectifier, equivalent in all respects to the American type 83. The peak inverse voltage is 1400 v., and the valve will provide a continuous D.C. output of 250 mA.

SINCE publishing details of some of the transmitting valves manufactured by the above firm, we have received particulars of further "Standard" valves which we feel will have an immediate appeal to the amateur. All of these valves are equivalent to well-known American types, and we understand that they are becoming increasingly popular now that the U.S.A. valves have disappeared from the British market. Apart from the valves described in our March issue, and those mentioned below, this firm developed, during the War, a special range of Grounded Grid Triodes for V.H.F. operation at frequencies of up to 750 Mcs., and although these are not perhaps of immediate interest to the average amateur, we mention the fact since these valves open up a new field to those interested in the higher frequency ranges.

5C/100-A.

This is an R.F. Beam Power Tetrode for operation at full ratings up to 30 Mcs., and at reduced ratings to 60 Mcs. It is fitted

Small Advertisements.

Readers' small advertisements will be accepted at 3d. per word, minimum charge 3/-. Trade advertisements will be accepted at 6d. per word, minimum charge 6/-. If a Box Number is required, an additional charge of 1/6 will be made. Terms: Cash with order. All copy must be in hand by the 10th of the month for insertion in the following month's issue.

QSL CARDS, Short Wave Listeners' and Full Call. Samples Free. Send S.A.E. to G6MN, Workop, Notts.

WANTED URGENTLY. Old copies of radio magazines. New prices given.—J. R. Bruce, Nairnpark, Nairn.

HALLICRAFTER SX24 (540-43500 kcs.) crystal filter, S meter. Perfect. Best offer around £40.—Hawkins, "Evening News," Leeds.

FOR SALE. 6J7G, 6Q7G, 6L7G, 6J5, 955, OQ15/600, Pen 25, HL2, VP23. Q.C.C. Fibre enclosed crystal holders 3/ea. Bases 1/-. Eddystone VHF coils, 3 & 5 turn 1/6 ea. Bases 6d. A number of variable capacitors, receiving type, and A.F. transformers. State requirements to—Box 1006.

VIBRAPACK—12 volt input, 300 volt 100 mA. output. Suitable for QRP Tx. Offers of cash or exchange to—G6LH, Stickney Rectory, Boston, Lincs.

WANTED URGENTLY. New or used Record Changer, complete with motor and pick-up. Also second-hand rack model HRO receiver.—Thomas, Polstrong, Camborne, Cornwall.

FOR SALE—B.T.S. 3 valve Trophy A.C. S.W. Receiver. What offers?—A. Jenkins, 61 Burton Road, Kingston-on-Thames.

RADIO INSURANCE. A special policy prepared by an amateur for amateurs. Radio equipment can be covered against ALL RISKS excluding accidental damage. The cost is only 10/- per £100. Public Liability indemnity up to £1,000 is included without additional premium. For full details write:—P. L. Gibbard, 5 Bird-in-Hand Court, 76 Cheapside, London, E.C.3.

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