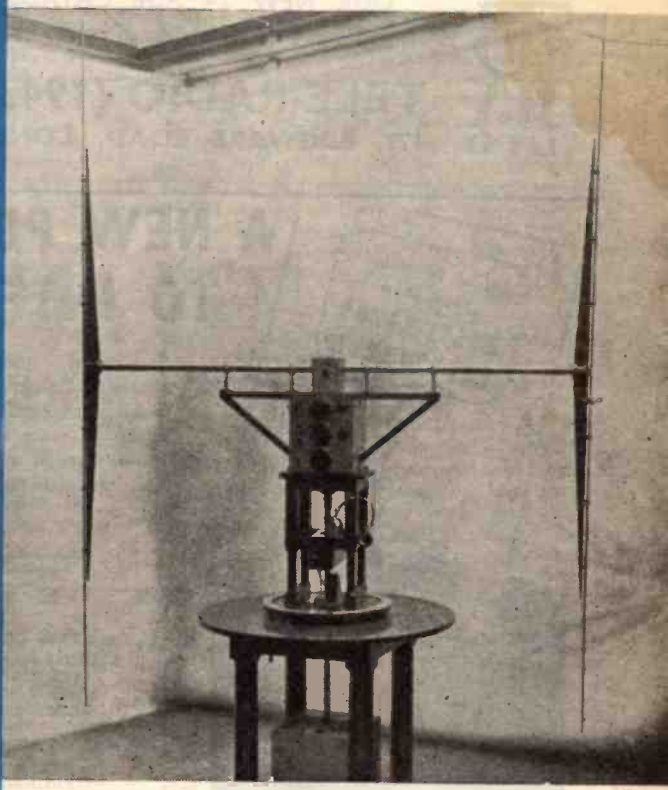
SHORT WAVE NEWS

Vol. I.
No. 8.
AUGUST, 1946.

In this Issue:



THE N.P.L. ADCOCK DIRECTION FINDER.

AN AMALGAMATED SHORT WAVE PRESS PUBLICATION.

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SHORT WAVE NEWS

Vol. I. No. 8. Annual Subscription, 16/-. August, 1946

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

EDITORIAL.

The American Loan

The thought upper-most in the minds of most radio amateurs on hearing that the American Loan had gone through must have been, "shall we now get a supply of American radio equipment and components similar to that of pre-war days?"

As far as we can gather, the answer appears to be, "No." Certainly not for many months at any rate. The loan is to be used for essential commodities and amateur radio gear can hardly be put in that category. The news that the loan will enable more paper to be purchased is cheering. Perhaps we shall not have to wait so long now, before we can give you a better S.W.N.

The Tower of Babel.

After a week on 14 Mcs., we gave up the struggle and went back to a modest "six watts on Top Band"! Before doing so, we did listen on 7 Mcs., but came to the conclusion that it just was not worth changing the coils in the Tx. We certainly anticipated a bit of QRM, but the 40 of pre-war days was nothing compared with present QRM conditions. We felt a bit browned off about it really. Not one of our half-dozen pre-war crystals would double into the new frequency allocations. So we sank our War Gratuity in a few new ones! One seemed to be in the clear, until a half kilowatt European 'phone thought the same about the spot and rubbed his crystal down to reach it. When we heard him remark that he had a sore throat because he hadn't stopped talking for eight hours, we decided to throw that xtal out of the window too! No, don't come gathering round like monkeys after nuts. We haven't any more left! So we started to toy with the idea of a VFO, but after chasing several stations up and down the band and learning that this new form of "fun" was due to an ECO, we began to wonder whether chasing butterflies wouldn't be better for us! It seems easy enough to make a VFO give a T9 note, but the "drift bug" appears to have bitten badly. If you drift even a little bit these days, the other chap will never find you when you go over to him. So watch your VFO in this respect. And when you're browned off with 14 or 7 Mcs., remember 1.8. There is room up there now where you can have one hundred per cent. QSO's with chaps who like rag chewing on the key, without being bothered by 'phone QRM and without losing half the QSO through QSB.

A.A. .Licences

We have heard the opinion expressed in several quarters that it is a pity the "A.A." type of transmitting licence has been dropped. Having seen the Radio Amateur's Examination paper set at the recent examination, we are inclined to agree. The standard of this paper was certainly higher than many of the "pre-exam era" amateurs would care to tackle, though actually it was an extremely fair paper, asking for just the sort of knowledge which the radio enthusiast who is taking on the responsibility of operating a radio station should possess. It is obvious that to be successful, the candidate of the future will have to do quite a bit of serious reading, which is certainly a good thing and will not be begrudged by the real radio amateur. However, it is an accepted fact that a few hours practical work is worth many hours reading. If a candidate for this examination hooked up each of the circuits described in our recent "Crystal Oscillator" article and if he were to do the same with the circuits to be published in similar articles on "Frequency Doubling" and "Power Amplifiers," and experimented with them, he would very soon know just about all he needed on these subjects. Presumably to do this under the present licencing regulations would be regarded as illegally operating a radio transmitter! However, there is one way out of this difficulty. Most Radio Clubs have more than one member who has a transmitting licence and many Clubs have their own licence. Under the supervision of such an experienced member, a course of lectures followed by practical work could be arranged, which would be greatly appreciated by those of their members who are going in for their "tickets." We recommend that Clubs consider this suggestion when drafting their Winter Programmes.

A.C.G.

My Favourite Short Wave Receiver.

No. 6: E. Mitchell, BSWL 1711

THE receiver illustrated below was built up on a 12in. x 9in. baseboard, in chassis form, with a sub-chassis space of 3in. for the purpose of housing the HT and GB batteries. Most of the components were gathered from a fellow enthusiast's junk box, but even so the receiver functions extremely well!

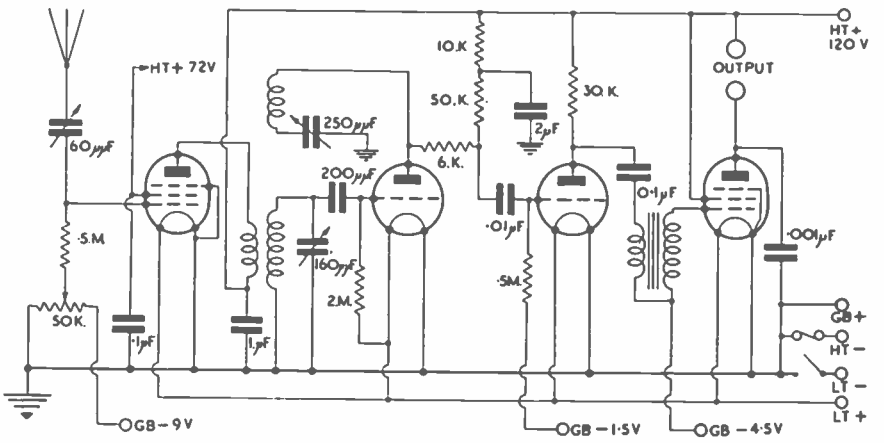
The circuit consists of an untuned R.F. stage, with R.F. gain control, followed by a triode detector and two A.F. stages. Very stout tinned copper wire is used throughout, and all small components are suspended in the wiring. The tuning coils are Premier 6-pin type.

Various valves were tried by BSWL 1711, who found that the following gave the best results:—R.F.—220VPT; Det.—210HF; 1st A.F.—210HF; Output—220HPT.

Odd points of interest include:—The A.F. transformer is of the "parafeed" type with a ratio of 3:1; The coils are mounted on ceramic stand-off insulators; Good slow motion is used for the tuning control.

An earth system was tried, but was found to have no effect on the performance of the receiver. The aerial used is a telescopic one, believed to have been originally used on a "jeep." This is erected on the roof, the lead-in being 30ft. long. The R.F. stage is really effective in cutting out frequency drift due to a swaying aerial.

Stability, selectivity, and general reception on this set is claimed to be of a high standard. Many Latin Americans have been logged consistently on the 25 and 31 metre bands, and the W's come in well on all bands, including the 16m. range. Loudspeaker reception is very good, with plenty of "punch." Mr. Mitchell says "This is a good DX set for anyone needing something more than the O-v-1."



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.

THE S. W. N. ABSORPTION WAVEMETER

Introduction

Even in these days, when crystal control is almost universally used, a wavemeter is an essential part of any efficient amateur station. The greater interest now being taken in the higher frequencies, has led to transmitters employing tritet oscillators and several doubler stages, and a wavemeter is absolutely imperative for identifying the various harmonics which such combinations can produce.

Most people use a simple absorption-type wavemeter for this purpose, consisting of a coil tuned by a capacitor over the desired range, the coil having a loosely coupled link of a few turns connected in series with a flash-lamp bulb, as shown in Fig. 1. When placed near the tank coil of an oscillating circuit, this tuned circuit absorbs a small amount of the R.F. energy which in turn is picked up by the link coil, thus lighting the bulb.

A much more sensitive instrument can be built, using a rectifier and a D.C. milli-ammeter to actually measure the amount of current induced in the resonant circuit, but few people have built such an instrument as the trouble and expense involved are hardly justified for an instrument of such limited uses. Modifications can, however, be made to the circuit enabling it to be used as a Field Strength Indicator, and as a 'Phone Monitor, so that a very useful multi-purpose instrument can be built up—well justifying the cost of the components. Such an instrument is described below.

As a Field Strength Indicator

Used as a field strength Indicator, the instrument is particularly useful in checking the radiation pattern of beam aerials, in adjusting aerials, and in making transmitter-aerial matching adjustments. The particular movement we employed—a new *M.I.P.* production which is more fully described in this month's *Component*

Review—has a large clear scale and pointer which enables the instrument to be read from quite a distance, a useful feature when using it for aerial adjustments. Very few 'phone stations would care to operate without being able to monitor their signals, so it was thought worth while incorporating this feature in the design as well.

The circuit diagram of the instrument is shown in Fig. 2. The wavemeter portion works on the same principle as the simple circuit shown in Fig. 1 except that instead of a flash lamp bulb indicating resonance, the R.F. energy induced in the winding L2 is rectified by the diode, an EA50, and the resulting direct current measured by the meter. To enable the instrument to be used as a field strength indicator, the movement employed must be fairly sensitive. A 1 mA. movement was found to be satisfactory for this purpose, but when used as an absorption wavemeter a considerably greater current than 1 mA. may be produced. To avoid possible damage to the movement, therefore, it is necessary to provide a shunt resistance and this should be preferably in circuit until such time as a current smaller than 1 mA. is indicated. To make certain of this the switch employed, S2, is a *Bulgin* product which is "biassed" so that it is normally in the "ON" position. It is convenient to make the shunt of such a value that the full scale reading of the meter is brought to 10 mA. In the majority of cases a 10 Ohm carbon resistor will be found accurate enough for a movement with a resistance of 100 Ohm, but where greater precision is required, a *Spot-On* resistor having a value of 11.1 Ohms can be used.

When used for field strength indications it will be necessary to use a short external aerial. In order to preserve the dial readings, the loading should be small and either an aperiodic winding or a series capacitor employed. In the latter case, a terminal can be mounted on the cabinet and the capacitor permanently incorporated. With the former method, a 6-pin coil can be used, or, if the aerial is of thick wire, this can be bent round to form a 2/3 turn coupling.

As a 'Phone Monitor

By putting a 'phone jack in the cathode lead as shown, the instrument can be used to monitor a modulated carrier—either M.C.W. or 'phone. No beat note is available, of course, for C.W. monitoring, but the presence of a chirpy note or bad key clicks can be detected. For 'phone work, the instrument is most useful for checking quality, whilst some indication is also given of the depth of modulation. Over-modulation is indicated by the meter flicking sharply when speech is applied.

Converting to Mains

The heater supply of the EA50 diode is shown in the circuit diagram as being obtained from a battery, and in our model we used a grid-bias battery for this purpose. Where the instrument is to be used within the confines of the shack only, it can be converted to mains operation by replacing the battery with a bell-transformer.

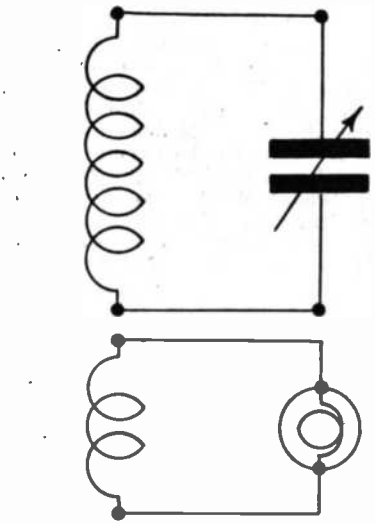


Fig. 1.

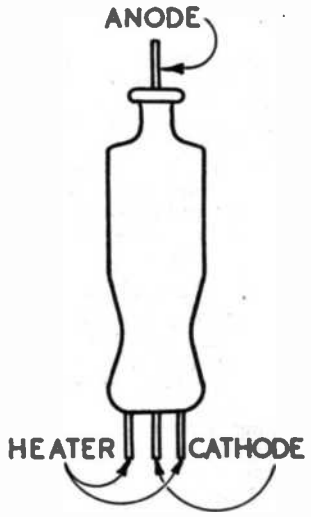


Fig. 4.

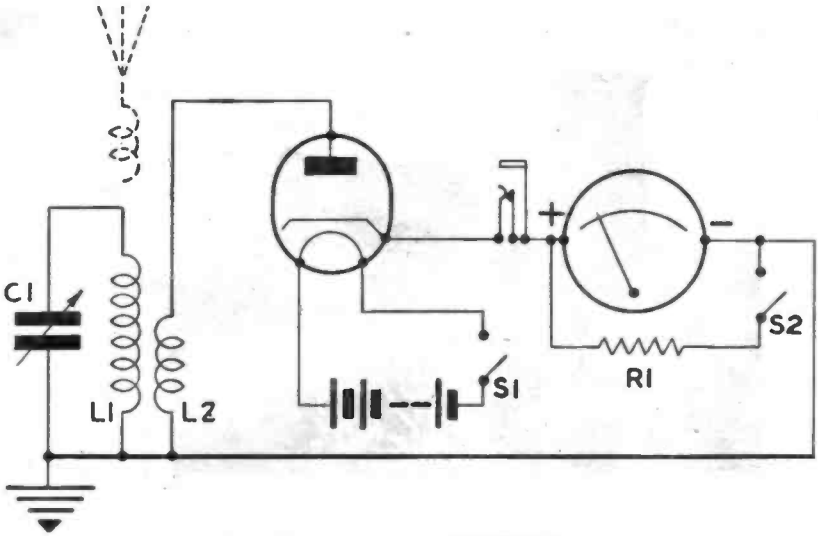


Fig. 2.—Theoretical Circuit.

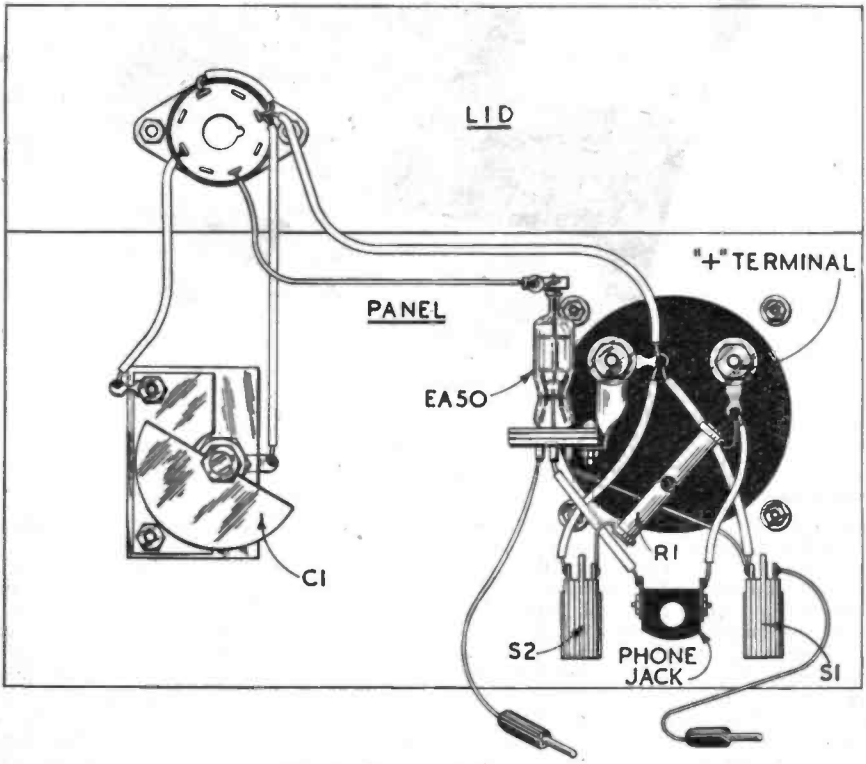


Fig. 3.—Layout of Components.

Rear view of the Wavemeter.

Construction

The general construction is plainly shown by the illustration. The case measures 8½in. long x 5in. high x 5in. deep, and was made up by 2ATV specially for this job from some spare pieces of tinplate and finished by enamelling, this being stippled when almost dry to give a pseudo crackle finish. Readers who do not care for metal-work, or who have limited facilities, can obtain suitable (though not identical) cabinets from several of our advertisers.

In the cabinet shown, the back and half of the top is made in one piece, hinged at the bottom, this arrangement allowing ample room for access to the coils. The latter are stored inside the case when not in use, conveniently placing them ready to hand and at the same time protecting them from the damage they would almost certainly sustain if kept loose around the shack. The housing for the coils consists simply of a series of holders mounted on a small sub-chassis. The cabinet, by the way, has only the one bend (the hinged portion), the remaining sides being separate pieces held together by soft solder. A

large soldering iron is recommended for this job!

All components are mounted on the front panel with the exception of the coil holder. The diode holder is mounted by a strip of metal anchored at one end to the negative terminal of the meter as shown in the lay-out drawing. Pin connections for the diode are shown in Fig. 4.

COMPONENTS WE USED

R1—See text	
C1—160 uuF variable	Premier Radio
L1, L2—4-pin plug-in coils	Premier Radio
Valve—EA50	Mullard
Valveholder and top-connector	Belling & Lee
Coil holders—International Octal	Premier Radio
'Phone jack	Igranic
S1—Type S259	Bulgin
S2—Type S272	Bulgin
Meter—2½in. Square Flange 0-1 mA.	M.I.P.

From Our Mailbag.

The Editors do not necessarily endorse the opinions expressed by their correspondents.

Dear Sirs,

As an old operative of the Royal Corps of Signals, 1914-1918 War . . . I feel I have lost touch these war years with Radio and I have never failed to make my weekly search for radio periodicals.

You will realise my pleasure on finding your "News" to hand, thanks. I hope to get going as a ham as soon as I can get something built. Call me a beginner, an "old" beginner. I trust you will give some attention to us new "old" ones. Here's hoping. Now there IS something to look forward to.

Yours sincerely.
L. King (Featherstone, Yorks).

(In spite of the present difficulties, we are doing our best to give "something for everyone," from the beginner to the "old timer". —Ed.)

Sir

While congratulating the R.S.G.B. on the power and frequency concessions obtained, it has surprised me that the society which claims to represent the amateur and prospective amateur, should, when acting in an advisory capacity to the G.P.O. help to formulate regulations which whilst favouring the pre-war licence holder, makes the entry of post-war prospective applicants more difficult. For years we have been told and believed that amateur radio had no distinctions. In my opinion the regulations as they stand will be effective in keeping as many off the air as possible, including many of the most desirable type. The opinions of readers who are prospective licence holders should be of interest.

Yours faithfully,
A. W. Mann (Middlesborough).

Introducing—

Firstly, Mr. Rex Gillett, pictured above, who has been appointed the official Australian Correspondent of *Short Wave News*. Mr. Gillett is the DX Editor of South Australia's "Radio Call," a bulky publication with a weekly circulation figure of around 30,000. He is also South Australian Representative of the B.S.W.L., Australian Representative of the Anglo-American Radio and Television Society, and is connected with many other societies, including the Australian DX Radio Club. Mr. Gillett is a DX-er of no mean ability and will contribute occasional notes on DX and general topics from "down under."

Secondly, we introduce Mr. "Grove" Calkins, who is now the *Short Wave News* Correspondent for the U.S.A. Mr. Calkins is the W1 District Representative for the B.S.W.L., and is the B.B.C. Observer for Massachusets, having subscribed data to the B.B.C. continually since 1935. He also holds a degree from the Trinity College of Music in London, and says "I already feel like a Britisher at heart"!

V.H.F. NEWS

Sporadic E. Propagation

LAST month we dealt briefly with tropospheric propagation, i.e., that type of propagation responsible for the transmission of 60 Mcs. waves over optical range, but not of such range as to be classed as "DX." The recent "DX," i.e., inter-continental contacts, which have been reported during the past few months, are due to "sporadic E" propagation, so a few words on this subject this month.

The E layer of the Ionosphere, is the lowest of the three main layers, being at a height of approximately 100 kilometers, with the FI layer at 200 km., and the F2 layer at 200-300 km. (1). In order to get our perspective right, let's remember that the troposphere ends at a height of 15 km., so these layers are pretty high up in the stratosphere.

Normally 60 Mcs. signals are not refracted or reflected by the E layer, passing straight through it, but occasionally patches of abnormally high ionisation occur in the layers, which will refract 60 Mcs. waves. This "sporadic E" propagation as it is called, usually occurs in summer and is noted chiefly in the late afternoon and evening (2). The cause of these "patches" of high ionisation is not definitely known. Quite a definite periodicity is said to occur and there is some evidence to suggest that the sun's radiations are responsible, as the appearance of sporadic E is often related to other ionospheric disturbances (3). Ionospheric storms are associated with the outpouring of corpuscles from sunspots (4). These were thought to affect the upper layers of the Ionosphere only, but it now seems that they may affect the E layer, or if not the E layer itself, these patches of high ionisation (5). The possibility that thunderstorms may produce them has been suggested (6).

These "patches" are regarded by some authorities as being more in the nature of a "cloud" or three dimensional mass, than a layer. These clouds drift about in the E layer (7). Propagation is therefore very erratic, as the path is constantly changing. Communication is by single refractions only, as the chance of another cloud being in the right place for a second "skip" is very remote. Skip is usually from 500-1500 miles and the received signals are of high intensity. (See V.H.F. News, last month and again below.) The signals disappear as suddenly as they appear and conditions may remain open from a few minutes only or for an hour or so. It is very difficult to foretell the arrival of "DX" conditions and the direction in which a path may open up depends on the position of the ionised cloud. Low angle radiation is only needed if the cloud is 500 miles or more away, and a beam aerial is unsuitable for this type of propagation as it becomes solely a matter of chance if the cloud is "hit." Some indication of the presence of these clouds can be got by listening for commercial harmonics and for "short skip" on 28 mcs.

References

(1) RSBG Bulletin. "Propagation of Radio Waves." Briggs. Jan., 45.
(2) "Radio Waves and the Ionosphere." Benington. p 78.
(3) QST. "Five-Meter Wave Paths." Wilson. Aug., 41.
(4) Short Wave News. "Sunspots and Short Wave Disturbances." April, 46.
(5) Nature. "Ionospheric Storm Effects in the E layer." Benington. 13 April, 46. p 477.
(6) RSGB Bulletin. "Propagation of Radio Waves." Briggs. May, 45.
(7) QST. "Five-Meter Wave Paths." Wilson. August, 41.

The Month's News

We will start off this month by extracting from the logs, the "outside G" contacts. Two periods stand out as having given good sporadic E propagation—June 15th-16th, and June 24th-25th. On June 15th, G5LL QSO'd I1AY, and G5BY QSO'd I1FA and I1DA. 5BY's QSOs were made at 1323 hrs. GMT and 1335 hrs. GMT respectively and the signal strengths both ways in the latter QSO were R9.

No further "outside G" contacts were reported by any station until June 24th, when 5BY worked F3JB, I1SS, I1AV, I1AY and FA8B, between 1948 hrs and 2025 hrs. GMT, signal strengths varying from R6 to R9. The latter QSO is the first post-war FA-G contact. FA8B was QSO'd again at 2057 hrs. on the 25th. G5BD and G5LL QSO'd F3JB, I1AY and I1DA on the

24th, F3MD being heard but not worked. G3IS also worked F3JB at 1758 hrs., R8. G8RS worked F3JB at 1916 hrs., R9 both ways. He heard I1AY, I1DZ and I1SS, but contact was not established. Short skip on 28 Mcs. or "dead" conditions were reported by all stations on these days.

Inter-G contacts have continued to be plentiful. 5BY has had 55 QSOs between June 15th to July 12th, the average of signal strength reports being R6/R5. 6DH has had 14 QSOs between June 10th and July 1st, average signal strength of reports being R5/R5. 6DH reports QSB on all his contacts, and 5BY reports QSB on about a quarter of his inter-G contacts. G8RS and G3IS's logs show a similar trend, i.e., low signal strengths on these tropospheric propagated signals with well marked QSB, whilst sporadic E propagation shows a high signal strength.

All the inter-G contacts reported have been made with beam aerials. 6DH now has a three element beam in operation and since putting it up he has had little difficulty in making inter-G QSOs. 5LL and 5BD have so far only QSO'd G6VX, apart from their continental contacts. They have not yet got their beams in operation and it will be most interesting to see what happens when they do get them working. Regarding beams, 3IS makes some interesting comments. He says he is finding that stations are becoming more and more difficult to log, owing to the increased use of Array Aerials, which, concentrating the beam in one direction only, result in many signals going unheard. But as he says, a beam does increase signal strength, both incoming and outgoing—and you cannot have it both ways. It does seem, however, that an omnidirectional aerial should be available as well as a beam.

6DH suggests that, where possible, prolonged observations on one or more regular stations is of far more value than reporting isolated instances of "DX." He also suggests that some form of "S" meter be fitted to the receiver, and he suggests the television signals as being suitable ones to observe. He himself keeps a continual record of the harmonic of GRM at Ongar, 50 miles S.W. of him.

With regard to the weather during the period under review, this seems to have been pretty variable. Of 6DH's contacts (on the East coast), 7 were made in the early morning or late evening with clear skys and no wind, two with a cool breeze from the sea, one in pouring rain with a completely overcast sky and two with a westerly wind and overcast sky. Looking over 5BY's WX report, one's attention is caught by the number of times "clear" and "thick mist" or "fog" appears. There is no doubt that quite interesting data should accumulate from logs submitted with good weather reports included. The wind at 5BY's QRA (Devon) has been in all quarters, though the tendency has been for a prevailing wind from the S.W.

We will conclude with G6DH's own comments on these subjects.

(1) Certain prophets are forecasting suitable conditions during summer months for contact between Britain and U.S.A. on 5 metres. This is *extremely* unlikely. A simple study of 10 metre conditions during past years should make this obvious. Summer conditions are limited to short skip which hardly ever exceeds single-hop distances of between 500 and 1200 miles-800 to 1000 miles most frequently. The most and only likely time for U.S.A. contacts would be at sunspot maximum by F2 layer bending in October—November and February. Low angle beams and highly sensitive receivers should make this possible during the coming winter or following year—but only spasmodically.

(2) Observations on GMR harmonic on 57.6 Mc. showed the band to be open for tropospheric contacts in the mornings, especially before 0800 GMT. A schedule was arranged with G2MV daily at 0600 GMT, with further checks at ½ hourly intervals up to 0800 and on some days hourly checks up to 1200 (by G2MV reporting on automatically sent tests from G6DH). Some interesting information is being collected but results are not yet analysed.

(3) For the past month, weather has been entered in the log in considerable detail—obviously necessary if any useful conclusions are to be arrived at. Details on humidity, ground and upper air temperatures have not yet been obtained.

(4) During the period June 15 - July 17, best tropospheric conditions were on July 8 and 9, when conditions were good from an early a.m. till late night with a drop during midday hours. Worst conditions were on June 19 and July 15, 16 and 17, coinciding with the break up of the fine anticyclonic weather on July 14 (with the appearance of "cold front" conditions).

(5) There is still a very obvious lack of European activity when intense "E" conditions prevail. Good short skip conditions on 28 Mc. are a *certain* indication of higher frequencies being open. Automatic "test" calls are always made from G6DH under such conditions, but it is discouraging to call test for hours on end with nobody operating at the other end!

Around the Broadcast Bands.

Monthly survey by "Monitor"
All times are given in G.M.T.

STILL more reports, notes, station schedules and "QSL's received" are needed for this column. Your scribe was rather disappointed in last month's mailbag. Let's have a better effort this month O.M's. DX conditions have not been too good over the last four weeks, but some improvement was noted at the end of the month when things were better after 2200. Very little was heard during day-light hours.

For the benefit of new readers, news and reports should reach "S.W.N." offices by the 15th of the month, latest.

● **From the Log-book.**

11970 kcs. (26.06m.) FZI, Brazzaville, F.E.A. Putting in an R9 signal nightly with news in English at 2045. Same transmission also over 9440 kcs. (31.79m.) also R9.

15200 kcs. (19.74m.) VLA6, Melbourne, R9 plus at 2115 with Forces programme directed to North Pacific area. Takes ABC programme at 2120 to 2200 then continues with records until 2300.

15150 kcs. (19.79m.) VLG7 heard at 2100 with news followed by Physical exercises and programme for listeners in Northern Australia at 21.20. News at 2145 and closed down at 2200. Signals were R6 Q4.

9590 kcs. (31.28m.) PCJ Eindhoven heard calling "Radio Macassa" at 2230 and appeared to be working duplex with this station later. Signals were R8.

13320 kcs. (22.52m.) "Radio Omdurman," Khartoum, Sudan. Heard at 1750 with Arabic programme. Signals R7 and suffers from bad CW QRM. Schedule is as follows:

In Arabic. All days of the week except Thursday from 1630 to 1800 and from 1900 to 1930.

Thursday from 1630 to 1730 and from 1900 to 1930.

Fridays from 0800 to 0930. Sundays from 0800 to 0900.

In English. Thursdays from 1730 to 1800.

Transmissions are radiated over 31.09 metres (9650 kcs.) and 22.52m. Verifies with letter veri.

5975 kcs. (50.20m.) Unidentified station announcing in French (Lady) as "Ici Radio—" at 0753. Signals were R6 with deep QSB. Has any reader logged this one?

(Could be "Radio Guadeloupe" on 5986 kcs. —Ed.)

● **Australasia**

The "Aussie" heard last May by our reader D. L. McLean (Yeovil) appears to be VLG7 on 15150 kcs. (19.79m.) and heard by your Scribe at 2045 with B.B.C. relay. Signals were R7 with some CW QRM. Programme was for listeners in Northern Australia.

T. Wilson (Kirkconnel) reports VLA6 15200 kcs. (19.74m.) at 2120 to 2215 at R8 with recordings for Forces in Pacific and Far East areas.

C. W. B. Stimpson (Grimsby) and D. Branham (R.A.F. Mepal) also report VLA6 on schedule. The latter reader also reports VLC9 17840 kcs. (16.82m.) Shepparton, with beam to South America at 2145. V. Hendy (Stourbridge) reports VLA6 at 1915 and states that they transmit from 2200 on Saturdays only. Signals were R8.

VLG7 heard by your Scribe with news in English at 2215 R6. Closed at 2230. Sundays only. Same programme also radiated over VLH4 11880 kcs. (25.25m.)

Transmissions to the British Isles are now as follows:

VLA4 11770 kcs. (25.49m.), heard R8 and VLC11 15210 kcs. (19.72m.), heard R4. Schedule is 0700 to 0753 daily.

The transmission over VLC8 in the 41 metre band appears to be suspended.

● **Asia**

China. Pearce reports XORA (ex-XGRS) Shanghai on 11705 kcs. (25.63m.) Schedule 0900-1530. Also XGOY Chungking at 1000-1130 on 11913 Kcs. (25.20m.), and from 1135-1630 on 9635 kcs.

● **Africa**

Belgian Congo. OTC5 17770 kcs. (16.88m.) heard with news in English 1630-1645. Terrific signal.

"Radio Dakar," FWA, heard on 6917 kcs. around 2100. Signals were weak, with QRM (Lyon). Schedule 1845-2100.

● **North and Central America**

A. W. Gilbert (Fordingbridge) sends in schedules of the N.B.C. United Network, etc. We regret we cannot find space this time, but will publish details next month.

VONH, Saint Johin's Newfoundland on 5750 kcs. (52.17m.) R5 at 0100. Power 300 Watts.

BROADCAST STATION COUNTRY PANEL

No. 4: Guatemala.

TGLA: Retalhuleu. "La Voz del Pacifico." 6295 kcs.

TGNA: Guatemala City. "La Voz de Libertad." 6255 kcs.

TGOA: Guatemala City. "La Voz de las Americas." 6494 kcs.

TGQA: Quezaltenango. "La Voz de Quezaltenango." 6401 kcs. 300 watts.

TGWA*: Guatemala City. "La Voz de Guatemala." 9760 kcs. and 15170 kcs. 10000 watts.

TGWB: Guatemala City. "La Voz Guatemala." 6540 kcs.

TG2: Guatemala City. "Radio Morse." 6620 kcs. 300 watts.

TG3†: Guatemala City. "Radio Morse." 2320 kcs. 300 watts.

TGX1: Guatemala City. 7012 kcs. 100 watts.

* *Also has channels on* 11760, 17800, 21680, 26070 *and* 26520 *Kcs.*

† *Not in operation at present.*

CJCX Sydney Nova Scotia heard on 6010 kcs. (49.92m.) at 0100. Signals weak with bad QRM.

A. Bower has heard COHI, Santa Clara, Cuba, 6450kcs. (46.51m.) closing at 0600. R5 Q3. TGWA "La voz de Guatemala" relaying TGW on 9760 kcs. (30.72m.) R8 at 2300 and after. Closes at 0400. Relays N.B.C. programmes chiefly from New York (Lyon).

CKNC and CKLX Sackville, Canada still put in fine signals especially around 2100 on 17820 kcs. (16.84m.) and 15090 kcs. (19.88). CKNC being the strongest. C.B.C. are now sending out monthly programme schedules on CKNC and CKLX transmissions. These are sent out from London (Eng.) for listeners in British Is. and Europe.

HH3W Port-au-Prince, Haiti 10135 kcs. (29.60m.) heard by your scribe R8 Q4 at 2340 with Latin American programme from N.B.C., New York. Does not verify.

● **South America**

A. Bower (Hull) reports "Radio Victoria," on 6010 kcs. (49.92m.) at 0530 and closing at 0600. Q3, R5. This is OAX4Q Lima Peru. OAX1A, Chiclayo is now on 7120 kcs. (42.10m.) (URDXC).

YV1RO "Radio Trujillo" Venezuela operates on 3310 kcs. (90.80m.) Power 750 watts. Announcements in Spanish only. Announces as "Radio Trujillo," Emisora de onda Corta YV1RO, 3310 kcs. en Trujillo, Venezuela, America del Sur, afiliala a la National Broadcasting Company. Schedule 1100-0330. QSL consists of 2 page folder showing views of station. Reports should be in Spanish! QRA: Radio Trujillo, Estado Trujillo, Republica do Venezuela, America del Sur. (Victory Radio Club, U.S.A.)

Argentina. LRY "Radio Belgrano" Buenos Aires, 6090 kcs. (49.20m.) R9 Q4 at 2300 heard by your scribe with news in Spanish and call "LR3 y LRY."

Curacao. PJC Willemstad on 7250 kcs. (41.38m.) Good signal when opening at 0000. Announces as "Princess Juliana Sender," clock chimes similar to those of Radio Nederland (Lyon).

● **QRA's**

COCD: P.O. Box 2294, Havana, Cuba.

Sweden: A. B. Radiojanst, Stockholm 7.

CSWD: "Radio Renascenca" Rua Capelos, Lisbon, Portugal.

LRS: Calle Ayacucho 1556, Buenos Aires, Argentina.

ZLT7: P.O. Box 3045, Wellington, New Zealand.

HC2AN: Radiodifusora "Cenit" P.O. Box 171, Guayaquil, Ecuador.

YNQ: "La Voz de la Victoria," Managua, Nic.

XORA: 7 Chung Cheng Road (Western), Shanghai, China.

●**QSL's Received**

D. L. McLean from VLA together with schedule and two booklets entitled "Know Australia" and "This is Radio Australia."

C. S. S. Lyon from CHTA, CHOL, CKLO, CJCX, VONH, HP5K, ZFY, PZH5, VLQ, CXA19.

Sidney Pearce from KNBA, KNBI, KWIX, KCBR, KWID, CKCX, CKLO, VLG7, XEBT (new card), CE1180, ZPA3, PCJ, YNQ, HJDE. (Nice going, O.M. !)

● **Acknowledgements**

D. L. McLean BSWL 804 (Yeovil); C. S. S. Lyon (Liverpool); D. Branham (R.A.F., Mepal); T. Wilson BSWL 2410 (Kirkconnel); C. W. B. Stimpson (Grimsby); V. Hendy (Stourbridge); M. Forrest (Salisbury); UR DX Club (U.S.A.); Murdoch B. Riley (Wellington, N.Z.); A. H. B. Bower (Hull); Victory Radio Club (U.S.A.).; A. W. Gilbert (Fordingbridge); Sidney Pearce BSWL 336 (Berkhamstead); and L. J. Scragg (Hayes).

Resonant Lines.

THE modern tendency of referring to coils, condensers, variable resistances, etc., as inductors, capacitors and variable resistors, might be all very well in the printed word, but I don't find it is generally accepted yet by old timers in normal conversation. Ingrained habits die hard and for my part I feel, after all these years, that it sounds rather pedantic to speak of a reaction coil as a reactance inductor, but I suppose in time I shall fall into line with the "moderns." Radio nomenclature is so full of anomalies. They seem to have started off on the wrong foot right from the start when they called it "wireless." The term "valve" too, looks like sticking for ever, despite America's firm insistence on the more accurate "vacuum tube." Even the recently added terms are often quite as bad. For instance, we all speak of "cold" cathode rectifiers, knowing full well the valve, sorry, I mean the vacuum tube, no, sorry once again, I mean the inert gas tube, is not cold, but hot!

H. & C.

I suppose quite a number of fans were puzzled when they first ran into the "cold" rectifier such as the OZ4, either in the Services or in car radios. I remember I was. I had heard of the theory of it but as cold valves had been the inventor's dream for so many years I failed to pay it much heed, thinking of it more as an interesting laboratory experiment, rather than as a practical proposition. As usually happens on such occasions the first one I saw was in the Services when I was miles away from anyone else who might know anything about them. Actually the O part of the designation gave a pretty broad hint. For those not so familiar with the naming of types in the American valve range, it should be noted that the first figure in all the modern types represents the heater or filament voltage. The term "cold" merely implies that they require no external heater supply, the cathode being heated by ions within the tube during operation.

Ventilation Problems

A point often dismissed too lightly in designing receivers is high temperature where it is the source of that bugbear, frequency drift, particularly in R.F. stages or the oscillator circuits of super-hets. While the importance of valve ventilation is generally appreciated, the heat generated in resistors is all too often under-estimated. The problem of heat dissipation has long been recognised in transmitter design and precautions are taken right from the first step in laying out. In receivers the underchassis heat can be so easily overlooked until it makes its effect apparent after the set has been fitted in its case and switched on for a while. The annoying part of this drift is the slow, continuous rise of the internal temperature which makes the tuning change gradual. This makes its quick recognition often more difficult, particularly in a set prone to this trouble only in the summer months when the ambient temperature of the room is considerably higher. In sharply tuned ganged R.F. stages the variation may not be easily detectable by mere re-tuning, and efficiency may be lost without the constructor realising it. Quite apart from the risk of tuning drift, adequate ventilation is important in all parts of the circuit and the life or satisfactory service of components may be materially shortened by high temperatures.

Time Marches On

The removal of the Royal Observatory from Greenwich to Hurstmonceux Castle in Sussex, to get clear of the smoke and glare of London's lights, is a change that has been discussed for a great many years. I lived for several years within a mile of the old site and felt some unjustifiable pride in the reflected glory of having the rest of the world set their clocks by my time. Greenwich will still carry the honour of marking the zero longitudinal degree for the world, with Hurstmonceux readings corrected to the zero meridian at Greenwich. The time has always had a fascination for me and as a small schoolboy I collected my first black-eye in a fight with another lad which followed my denying that he could cycle to school from his neighbouring village in minus 30 seconds. He claimed to do the journey quicker than the sun, and as neither of us was able to prove our point to the other's satisfaction mathematically, like schoolboys (and Nations) we resorted to force.

Shocking Girl

The Dumb Blonde decided to smarten up the Shack and got weaving with the duster. Somehow her fingers came in contact with the H.T. As she sorted herself out from the mangled remains of a half-finished chassis in the corner, she remarked "I never dreamed I was a girl of such low resistance!"

Centre Tap

BROADCASTING STATION LIST.

Part 6: 7280 - 6750 kcs.

THIS list has been compiled by the Short Wave News Monitoring Department, 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)*
7280 ...	VLA	Shepparton, Australia	Radio Australia	100000
7270 ...	——	Moscow, U.S.S.R.	Radio Centre Moscow	
7265 ...	VQ2CM	Luanshya, Rhodesia		
	——	Cueta, Spanish Morocco	Radio Ceuta	200
7260 ...	GSU	Daventry, England		50000/100000
7257.5 ...	JVW	Tokio, Japan		10000
7255 ...	——	Hanoi, Indo-China	The Voice of Viet Nam.	
	VUM2	Madras, India	All India Radio	10000
7250 ...	PJC1	Willhemstad, Curacao	Radio Princess Juliana	3000
	KGEX	San Francisco, Calif.		100000
	WNRX	New York, U.S.A.		50000
	WRUA	Boston, Mass., U.S.A.		
7240 ...	VLQ	Brisbane, Australia		10000
	TPB28	Paris, France	Radiodiffusion Francais	25000
	VUB2	Bombay, India	All India Radio	10000
	VUD8	Delhi, India	All India Radio	7500
	LLR	Oslo, Norway		
7239 ...	HC1CQ	Quito, Ecuador	Radio Union Agencias Unidas	130
7230 ...	GSW	Daventry England		50000/100000
	KWIX	San Francisco, U.S.A.		50000
7220 ...	KOFA	Salzburg, Austria		1000
	——	Singapore, Malaya		25000
	JCKW	Jerusalem, Palestine		7500
7215 ...	VLQ2	Brisbane, Australia		10000
	RW96	Moscow, U.S.S.R.	Radio Centre Moscow	
7210 ...	FGA	Dakar, Senegal	Radio Dakar	
	HEI3	Berne, Switzerland	Radio Suisse	25000
	VUD10	Delhi, India	All India Radio	20000
	VUC2	Calcutta, India	All India Radio	10000
	GWL	Daventry, England		50000/100000
7205 ...	HI9N	Puerto Plata, Dominicam Rep.		
7202 ...	YSY	San Salvador, El Salvador	Por la Libertad del Mundo	250
7200 ...	RW96	Moscow, U.S.S.R.	Radio Centre Moscow	
7185 ...	GRK	Daventry, England		50000/100000
7180 ...	——	Vienna, Austria	Radio Wien	800
7177 ...	——	Moscow, U.S.S.R.	Radio Centre Moscow	
7170 ...	FIQA	Tananarive, Madagascar	Radio Tananarive	500
7165 ...	——	Moscow, U.S.S.R.	Radio Centre Moscow	
7160 ...	HC1BF	Quito, Ecuador	Radio Commercial	500
7150 ...	XGOY	Chungking, China	The Voice of China	10000
	GRT	Daventry, England		50000/100000
7140 ...	HC4FA	Portoviejo, Ecuador	La Voz de Manabi	100
7130 ...	HC2AX	Vinces, Ecuador		
7126 ...	——	Hargeisa, Br. Somaliland	Radio Somali	1000
7120 ...	GRM	Daventry, England		50000/100000

Frequency	*Call-sign*	*Location*	*Slogan*	*Power (watts)*
7105 ...	——	Bissau, Port. Guiana	Radio Bissau	50
7100 ...	EAJ7	Cuenca, Spain		
	——	Madrid, Spain	Radio SEU	
7095 ...	EA9AI	Tetuan, Sp. Morocco		
7085 ...	YI5KG	Baghdad, Iraq		
7065 ...	GRS	Daventry, England		50000/100000
7063 ...	——	St. Johns, Antigua	Radio Antigua	
7060 ...	CP11	La Paz, Bolivia	Radio Amautha	600
7055 ...	HC2CM	Guayaquil, Ecuador	Radiodifusora Imam	250
	CR6RF	Benguela, Angola	Radio Club de Benguela	
	OQ2AB	Elizabethville, Bel. Congo	Radio Elizabethville	100
7050 ...	ZOY	Accra, Gold Coast		5000
	XNCR	Yenan, China		
7045 ...	FET15	Cordoba, Spain	Radio Cordoba	
7040 ...	HHCB	Port-au-Prince, Haiti		
	YSI	San Salvador, El Salvador	Radio Intercontinental	100
7037.5 ...	EAJ3	Valencia, Spain	Radio Mediterraneo	3000
7032 ...	HI8Z	Santiago de los Caballeros, Dominican Republic	Cadena Nacional de Radio	200
7026 ...	——	Malaga, Spain	Radio Nacional de Espana	10000
7018 ...	——	Pont Delgada, Azores	Emissora Regional Azores	1000
7012 ...	TGX1	Guatemala City, Guatemala		100
7010 ...	XPSA	Kweiyang, China	Kweichow Broadcasting Station	10000
7005 ...	FET1	Valladolid, Spain	Radio Nacional	
	EA9AA	Melilla, Sp. Morocco	Radio Melilla	200
7000 ...	HC1VT	Ammato, Ecuador	La Voz de Tunguragua	250
6980 ...	FO8AA	Papeeti, Tahiti	Radio Club de Tahiti	200
	——	Moscow, U.S.S.R.	Radio Centre Moscow	
6950 ...	YNQ	Managua, Nicaragua	La Voz de Victoria	
6940 ...	RV90	Frunza, U.S.S.R.		
	——	Moscow, U.S.S.R.	Radio Centre Moscow	
	——	Padang, Java	Radio Republic Indonesia	
6920 ...	——	Moscow, U.S.S.R.	Radio Centre Moscow	
	YNWW	Granada, Nicaragua	Radio Sport	
6917 ...	FGA	Dakar, Senegal	Radio Dakar	300
6900 ...	——	Bratislava, Czechoslavakia		
6870 ...	——	Yakutsk, U.S.S.R.		
6850 ...	YNOW	Managua, Nicaragua	La Voz de la America Central	600
6820 ...	——	Tashkent, U.S.S.R.		
	SUP2	Cairo, Egypt	Radio Cairo	10000
6790 ...	——	Jaffa, Palestine	Sharq al Adna	
6788 ...	ZNB	Mafeking, Bechuanaland		
6786 ...	HI2A	Santiago de los Caballeros, Dominican Republic	La Voz de la Reeleccion	250
6782 ...	HNF	Baghdad, Iraq		
6770 ...	CP49	La Paz, Bolivia	Radio Municipal	500
	——	Singapore, Malaya		25000
	——	Moscow, U.S.S.R.	Radio Centre Moscow	
6760 ...	ZNR	Aden, Arabia		
6758 ...	YNPS	Managua, Nicaragua	La Voz de Nicaragua	800
6750 ...	JVT	Tokio, Japan		25000

SHORT WAVE LISTENING.

No. 1 of a series—By the Assistant Editor.

THE reporting of short wave reception is one of the most popular aspects of our hobby, and yet, strangely enough, there are many who do not give their reports the attention they should receive. Amongst newcomers especially there will be found a tendency towards inadequate reporting, which is understandable, but "old timers" are also culprits. The reasons for these incomplete reports can usually be traced to one or more of the following reasons: (a) Lack of experience, (b) Shortage of spare time, (c) Absence of any criterion for reporting, (d) Lack of imagination and thought, and in extreme cases (e) Plain selfishness.

Reasons (a) and (d) appear to be the more predominent but are not of a serious nature.. This series will, we trust, oust (c), whilst (e) is fortunately only applicable to isolated cases and can be forgotten for practical purposes. The erroneous attitude that some listeners have towards reporting can be rapidly corrected by observing certain fundamental principles. It should be borne in mind that, in most instances, listeners' reports are unsolicited so that the responsibility is entirely the listeners'. Therefore, it is obvious that to be of any value whatsoever, the report must contain information which goes much further than a few vague details. It must also be understood that the object of sending reports is to provide station authorities with data of such a nature as to assist them in studying their radiation. Most well established broadcasting stations are fully aware as to the potentialities of their signals, as also are a large percentage of amateur transmitters, so that a report of the "Your sigs. QSA5R9 at 2100 on Sept. 21st, Pse QSL" type is to say the least hopeless and will no doubt be subjected to the indignity of being billeted in the waste-paper basket! The report that is submitted solely with the intention of securing a verification is so very obvious in nature that very few stations will deem to reply, even if return postage is enclosed. The QSL card should be regarded by the conscientious listener as a token of appreciation from a station for services rendered, and reports should be compiled accordingly. With this attitude established, the reporter will stand a much better chance of receiving replies.

Some stations will answer almost any report, especially those who take the opportunity to send their listeners propaganda literature. It is understandable that many newcomers, obviously sending reports to the more powerful stations, receiving courteous replies, assume that the same type of report will bring forth the desired effect from any other station. If their reports are scarcely adequate, then the newcomers start off on the wrong foot, and stay that way! However, the listening fraternity can be, and has been, of a definite use to transmitting stations, but on the other hand individual listeners can often be a pain in the neck! So we ask of you, our readers, to study this chapter and find out if your reports could be improved.

Discrimination:

To be a successful reporter, the listener must first learn the knack of discrimination. The rather elastic term "DX," when applied to a particular station, is dependent on various factors for its use, such as power used, distance from reception station, and frequency of transmission. For example, amateur stations in Italy or France using 25 watts on say, 7 Mcs., could hardly be classified as "DX," yet the self same stations, if operating on 5 metres, would be a definite DX "catch." A powerful U.S. station, using beam aerials, operating in the 19 metres band could not, by any stretch of the imagination, be termed a catch, yet a QRP ham station of identical locality operating in the adjacent 14 Mcs. band would be quite worthy of mention. So you will see that a certain amount of common sense is called for when embarking on reporting. There appears to be no hard-and-fast rules regarding sending of QSL cards. Some stations answer every report; some only those enclosing return postage; some none at all; others are spasmodic, i.e., will reply to all reports for a while and then will cease replying for no apparent reason! The process is usually repeated at a later date and this is typical of certain Latin American stations. Then again some stations reply by return post, whilst others are "veri-slow." When writing to an amateur station it should be remembered that he may have limited time in which to reply to letters, and also that he may not be in a position to stand the expense of reply-

ing to listeners' reports. Even if return postage is provided, it must be realised that the cards themselves can be an expensive items to most hams.

The plague of useless and unwanted reports generally falls on the more powerful ham stations in semi-DX localities or those in "rare" countries, rare inasmuch as they are usually the sole active radio station in their particular country, usually some small island, and so find themselves within range of the "Country Club" fans! Further complications for the reporter may arise owing to his financial status, as reporting can be quite an expensive hobby and the inclusion of return postage with each report may mean a serious curtailment in activities. Taking into account the points raised, it will be clear that before a report is sent out, the pros and cons should be considered and a definite policy decided upon. There is, of course, the brighter side! Many broadcasting stations not only send a QSL but "propaganda" literature such as travel guides, and pamphlets dealing with local attractions. A few stations send regular programmes and schedules, and before the war two stations have been known to present lucky listeners with sets of their current mint postage stamps! The writer once received a ½-pound packet of coffee from one enterprising Latin American station! From time to time some stations, notably those of the U.S.A., advertise that reports on particular programmes will be rewarded by such items as autographed photographs of prominent artistes, special booklets and so forth.

Return Postage:

Where return postage is to be enclosed with a report, two alternative methods can be adopted, (a) Reply Coupons, or (b) postage stamps. Reply Coupons are obtainable at most Post Offices and are of two types, the International Reply Coupon (price 6d.) and the Imperial Reply Coupon (price 3d.) The former are valid for foreign countries, whilst the latter, as the name suggests, should be sent to countries within the British Empire. Both types of coupon may be exchanged at their respective destinations for appropriate postage stamps for reply purposes. It should be noted that certain Latin American post offices refuse to accept these coupons, but luckily these instances are rare and are confined to a few of the smaller republics in Central America.

The second method is more economical, but has certain disadvantages such as the fact that the necessary stamp for a particular country may be difficult to obtain. However, most reliable stamp dealers will be able to supply mint stamps of most countries.

One final note before leaving this subject. Do not assume that by enclosing return postage that a reply is guaranteed! It will certainly help, but we believe a great number of operators have an alternative hobby—that of collecting mint postage stamps!

Programme Details:

The first item to be included in any report must obviously be some form of check, in order to make verification possible. In the case of a broadcasting station, sufficient details of the programme should be included so that a definite check can be made against the station log. We know of many cases where the submission of such scanty detail, or complete lack of it, and insufficient data, has resulted in the loss of a QSL. We do not, however, advocate that the prospective reporter compiles a report approaching in size a biography of the station's activities! All that is necessary is an intelligent extract from the programme, the decisive factor being the type of programme radiated. Often, a half-hour extract of the transmission should be recorded, but sometimes less would suffice, or alternatively a more lengthy statement would be required. For instance, if the programme was of a musical nature then a few of the tune titles would provide most of the requisite check. If, on the other hand, a news bulletin in some strange language, or music of primitive style, comprised the programme, then it is hardly fair to expect this to provide a conclusive check. Common sense must be used to determine whether the details given can prove beyond doubt that the station in question has been heard, and that the details have not just been copied from some written programme schedule.

The procedure varies somewhat with regard to hams, but the fundamental principle is indentical, i.e., to provide a conclusive check. In this case details should be given of other stations worked and/or called, and of any special tests conducted. The "personal touch" in reports to hams will not only help to establish definite proof but may elicit a reply where it would not otherwise have been forthcoming. As an example, an operator may be heard with a violent cold in the head! When writing ask how his cold is! Some "technical hitch" may occur during a transmission. Mention this when writing. Small items such as these may help in establishin proof of reception, but we ask you not to overdo the effects!! [To be cont.

Around the Shacks.

No. 5: G3IP.

THIS month we introduce Mr. A. W. Brookson, of 15 Checker Street, King's Lynn, Norfolk, who was granted the call G3IP in 1938. His experiences in radio go much further back than that, however, as he trained as a radio operator at Cranwell in 1917, serving overseas till 1919—most of the time using a Marconi ½ kW. portable spark TX and crystal receiver.

The transmitter line-up at present is the same as in the photograph, with KT32 (CO), and KT33C (PA), running on 200 V. D.C. The speech amplifier consists of a 6SJ7, L63, and two KT33C's in push-pull. The microphone is a G.P.O. type 10 Carbon inset.

On the receiving side a 1-v-1 takes care of things. The aerial is a 70 foot end fed, 26 feet high, and running from a chimney stack to a mast. Direction is NE/SW. This aerial functioned extremely well on 28 Mcs., and many W's were worked during the recent period of intense activity on this band.

The main interest at this station at present is the 1.8 Mcs. band and much good work has been put in. For work on the top band, the aerial is lengthened to 132 feet, which necessitates the end coming to within 10 feet of the ground. Coupling to the PA is via a coil which fits over the PA coil and is series tuned for 1.8 Mcs., being tuned for maximum brilliance in a .5 Amp. bulb in aerial lead. Results on the band have been constantly good, both on 'phone and CW. The best DX to date consists of LA5XY, OK1FF and GC8NO on CX and D4AF on 'phone.

Measuring equipment includes a field strength meter, used in the shack for tuning and 'phone monitor, a frequency meter with 100 kcs. and 500 kcs. crystals for spot frequencies, and so forth.

CONGRATULATIONS

to the R.S.G.B. Bulletin on having completed 21 years of service to the Radio Amateur with last month's number. Like the rest of us, the present "Bull" is suffering from "malnutrition" but we hope to see it soon restored to its former strength of pre-war days.

WORLD NEWS

AMATEUR ENTHUSIASTS IN GREECE

By Stanley Gow, ex-XABR

IT is hoped that these notes may "clear the air" for the benefit of many readers who have heard or worked any XA stations in Greece. Our leader ham, SV1EC (ex-G, ex-SU, ex-VU!!), produced the necessary gear for amateur enthusiasts to get on the air. The main thing of course was the allocation of a call-sign from Army HQ. Once that came through it was only a matter of time, patience, "burning the midnight oil," testing, and so on, before the rig looked like it might get out! One's bedroom often looked like Bateman's reach-the-moon rig! But it usually worked.

My first contact was with LA8C on 'phone, and after that it was easy. Intense experimenting with aerials followed this first QSO. Then gradually more XA stations came on the air, until we had quite an activity. Readers can QSL direct to any XA station in Greece via C.S.O., Land Forces, Greece, if not in possession of a full QRA. Listed below are the current stations now operating, and their respective addresses:—

SV1EC: QSL to 9 Hill Street, London, W.1.
XACD: 18 L. of C. Signals, Land Forces, Greece.
XABL: 13th Division Signals, Land Forces.
XAAP: American Division, Hasani Airfield, Athens.
XABW: 1st Field Regt. Signals, Land Forces.
XABR: now operated by:—Capt. Idris Thomas, Wireless Section, 13th Division Signals, Land Forces.

I would like to take this oportunity of thanking all those G's who provided me with such fine QSO's during my stay in Greece, and I hope to meet them all again soon when I am on the air again with a G call.

(Editorial Note:—We have word that the Hellenic Radio Amateur League has resumed activities under the Presidency of S. E. Stephanou (SV1GR). All QSL's for members of the League, that is all SV1 stations, can be sent to the H.R.A.L. QSL Bureau, 14 Alkmanos Street, Athens.)

From the U.S.A.

The plan for United Nations to establish its own independent broadcasting system, to be known as the "Voice of United Nations," is gaining support. Immediate favourable reaction came from Secretary-General Trygvie Lie of the organisation after the proposal was made by David Sarnoff, head of the R.C.A. at a recent conference.

It is said that station WRUL, which has been, since the war, operating under the government, expects to return to its own control in the very near future. It may, for the time being, radiate such programmes from the U.N. Network that are commercial, the remainder of the air-time being taken up with cultural broadcasts.

(*S.W.N. Correspondent.*)

Australia

The Australian DX Radio Club has made arrangements with "Radio Australia" to broadcast regular DX programmes to the British Isles and North America. These commenced on Saturday, July 27th, and will henceforth be radiated every Saturday. The complete set-up is as follows:—VLA3, 9690 kcs. (30.99m.), beamed to the British Isles, from 1545-1557. VLC9, 17840 kcs. (16.82m.), beamed to North America, from 0110-0130. Programmes will consist of latest "Radio Australia" news, DX talks, music and club activities. The script for these programmes are prepared by the A-DX-RC. Reports on reception are cordially invited.

(*Australian DX Radio Club.*)

Czechoslovakia.

After seven long years, the Czechoslovakian Short Wave League has resumed activities and licenses are being issued. The League is now running three short wave periodicals, "Kratke Vlny," "Short Wave," and "QTC," under the Editorship of Otakar Halas. The League welcomes correspondence with other active short wave clubs, and are willing to exchange their club publications for other periodicals. Correspondence should be addressed to:—O. Halas, OK2RR, Bratislava 9, Post Box 34, Czechoslovakia.

Club News of the Month.

BIRMINGHAM & DISTRICT SHORT WAVE SOCIETY (BSWL Chapter)

The club is still making fine progress, and meets on the first Monday of each month. The August meeting is to be on the 12th, owing to the Holiday. At a recent meeting, R. Carter, conducted a Radio Quiz.

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

HOUNSLOW & DISTRICT RADIO SOCIETY

Since the inaugural meeting on May 22nd, the number of club members has risen to 31, with an average attendance of 22. Talks have been given on straight and superheterodyne receivers, with discussions and demonstration following. The meeting of June 26th dealt with the super-regenerative receiver. Future programme includes talks on The Theory of the Super-het, Transmission, Television, etc. A morse class and club library are being considered.

Secretary: A. Pottle, 11 Abinger Gardens, Isleworth, Middlesex.

LIVERPOOL & DISTRICT SHORT WAVE CLUB (BSWL Chapter)

Recent talks have been "Oscillators," by G6KS, and "Basic Radio," by Mr. Hutchinson. The latter is being given in weekly parts. A highlight was the demonstration of the Canadian Army "58 set." Morse classes and auction sales are now regular features, and a library is flourishing. A Quiz was held recently with the local R.S.G.B. gathering, the result being a draw. A return "match" is being fixed.

Secretary: T. W. Carney, G4QC, 9 Gladeville Road, Aigburth, Liverpool, 17.

LONDON CHAPTER OF THE B.S.W.L.

A complete re-organisation has recently taken place. The London Chapter proper has suspended activities until September, when meetings will be resumed on Tuesday evenings. In the meantime, meetings will be held at the new N.W. London Chapter, which is situated at Dudden Hill, N.W.10. Readers able to reach this district on Tuesday evenings are cordially invited to apply for further details.

The Grafton Radio Society has recently been granted affiliation to the B.S.W.L., and will henceforth be the North London Chapter.

Secretary: (N.W.) N. Stevens, BSWL 1039, 53 Madeley Road, Ealing, W.5.

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

READING & DISTRICT RADIO CLUB

At the monthly meeting of May 25th, G8RS gave an interesting talk on 60 Mcs. transmitters, followed by a general description in "layman's language" of Radar.

On July 27th a talk on converters, small receivers and noise silencers was given.

Entry forms are now ready for the Lewis Cup, which is for the best piece of home constructed radio apparatus made by a member from the "junk box." Judging will take place on September 28th, all entry forms having to be in the hands of the Secretary by August 31st.

Secretary: S. Nash, 9 Holybrook Road, Reading.

RUGBY CHAPTER OF THE B.S.W.L.

The first preliminary meeting has been held, and it is hoped that Rugby readers will co-operate with the present "nucleus" in order to build up a flourishing club. At present the meetings are being held at the Secretary's QRA, to whom enquiries should be directed.

Secretary: N. W. White, G3IS, 59 Eastlands Road, Rugby.

WEST MIDDLESEX RADIO CLUB

A meeting has been convened for Wednesday, August 14th, and will be held at the Labour Hall, Uxbridge Road, Southall, at 7 p.m. The formation of groups to cover a wide range of activities is proposed, and all interested, including former members of clubs in this area, are invited to attend. Business at this inaugural meeting will include the election of officers, and the discussion of other matters concerning the organisation of the club.

Secretary: H. E. James, G5JM, 215 Broadway, Southall, Mddx.

TO CLUB SECRETARIES

We have decided, in view of the purely local interest that club news holds, to adopt a new method of presentation. In future, club news will comprise a form of directory, that is we will give the following details only:—Name of Club; meeting place, times and dates; Secretaries name and address; Details of special meetings.

It is hoped that Club Secretaries will forward, from time to time, details of any alterations in such details.

On the Ham Bands.

Conducted by "C.Q."

ON the reverse side of the QSL card illustrated above, is the information that the Op. (Capt. John Serafin) worked dozens of G's on 28 Mcs. Also we read that the receiver was a Super Pro with preselector, and that the station "*ran a few kilowatts.*" The italics are mine!

14 Mcs.

Without a doubt, the release of this band for most of the world was the highlight of the month. Apart from the DX, short skip has provided much interest during the late mornings, and on one occasion GI's and GM's were coming in R9, but with severe QSB. An interesting set of conditions has been observed on several ocasions with N/S 100-300 mile contacts, and E/W 1000-2000 mile contacts. At the moment East Coast W's and Latins, are coming in between 1900-0400; West Coast W's between about 1700-1800 and early mornings; ZL/VK's, etc., between 0400-0700.

DX!

T. Burton, BSWL 709, of Birmingham, submits a really fine log of DX, some of the best being: CE6AO (14200 kcs.), HH5PA (14210), K6IQN (Hawaii, 14245), OA1A (14060), PZ1A (14020 and 14340), TI4JG (14110), VP2GB (Grenada, 14370), ZP5AA (14080), all on 'phone. On CW, Tom reports, AC4YN (Llasa, Tibet, 14150), CR9AG (14140), KP4AU (14140), K7JDS (14110), VE8AW (Yukon, 14130), VK7CW (Tasmania, 14060), VS4JH (Jesselton, North Borneo, 14120), VS9AN (Maldive Isles, 14130), W6PUZ/KG6 (Tinian Isles, 14250), XU1RP (14130), ZD8A (14350), ZE1JI (14120), and several VK's, ZL's, etc. The RX at BSWL 709 is an 0-v-1, with a 66 ft. "T" aerial. Tom has now heard 152 countries, and holds many DX certificates. A new country not hitherto reported is St. Thomas Isles, via W1IAV/KV4.

S. Garner (Burnham) has heard TG9RC, ZL4BB, 11 VK's XU1RP, VU2WP, W2OOA/J8, W2KFB/J2, etc., on CW, and VK2AL, TI2RC, OX1AA, etc., on 'phone. OX1AA is operated by W2NDV, at an airport in Greenland, using a power of 400 watts.

E. A. Kimber (Stockton-on-Tees) reports VO6F, KP4PG, KV4AU, and many Latins and XA's.

From the U.S.A. we have an excellent log from Roger Legge (New York), who has heard:— CP5EA (14270), ZP1XA (14070), ZP5AC (14030), ZP8AC (14020), TG9JC, TG9JS, TG9LP, YN1RA. QSL's have been received from YI3R, VO1A, VO1D, VO2KJ, HK1AV, PY4EA, PY4GB, PY7AN and TI4JG.

Lionel Le Breton has heard some worthwhile DX in PZ1FM, ET3Y, OQ5LL, ZD8A, EL4A, VS7JX, XU1RT, VU2WP, HK6AF, VP4TR and several VK's, W7's, etc., on CW, and VS1BF on 'phone.

John Hawkins (Leeds) has also put in some good work, having heard CP1AX, KP4BG, PY9AF, PZ1A, VO6G, VP4TF, ZP1L, ZP7AA, ZP8AC on 'phone, and KZ5AD on CW.

28 Mcs.

Despite generally poor conditions, much in the way of interesting DX has been heard during the past month. Geoff. Johnson, G2BJY, reports mostly short skip stations, with smatterings of DX. During the early part of the month, VU7BR, ZS6DW and ZB1F were the best. Later on, YI2CA, VQ4ERR, ZS1C, etc., entered the log book. The last interesting station heard was W6QVF/K4, operated by Firman Lopez. 2BJY remarks that a considerable exodus took place when 14 and 7 Mcs. re-opened, but quite a lot of short

skip working has continued.

A. Hamilton (London, N.W.6.) reports his best DX of the month as VQ3EDD, VQ2LC, ZE1JU and LU8AK on CW, and VP6YB, KP4AZ and OQ5BJ on 'phone.

Lionel Le Breton (Dorchester) heard ZS6HS, ZS2X on CW, and SU1KE on 'phone.

The " pick-of-the-bunch " from L. Howes this month is KZ5AA, KP4AJ, PY1DN and YI2XG on CW, and PY5AQ, ZS1AZ, ZS2AZ and TG9RC on 'phone.

A new one to me is OD2AC, who says he is in Syria. Any offers ?

Other Bands.

Regarding 7 Mcs—just read this month's Editorial ! I have no further comments ! It is still, possible, however, to catch that elusive DX, from around 2230 onwards, and we would be pleased to have readers logs for DX on this band. Lionel Le Breton reports PY1UJ on both 'phone and CW.

3.5 Mcs. is quite a crowded band these days, with plenty of DX if you care to crawl out of bed at the crack of dawn! W's galore, and VE's VO's and so forth. I did notice that the W's appeared to reach peak strength just as the sun appeared above the horizon. A log we feel we must publish comes from J. Hall of Thornton Heath, who lists the following 3.5 Mcs. CW calls: VO8AR, KP4AE, KA1CM (! !), VE1EA, HO, IA, JV, LZ, NY, PQ, QI, QT, 2HW, MP, 3HP and 153 W's ! ! Also W9TLB/3. Who can beat this log ? Heard between 0300-0500.

J. Clarke (Brentwood) has heard, in addition to the usual W's, KP4AU (at 0100), CO7CX and VE2KW on 'phone.

Top-band is still alive and kicking despite the many prophets who declared that the band would fizzle out as soon as the DX bands returned. Activity is not so great as in previous months, but there is less QRM, which is a blessing.

Facts and Gossip.

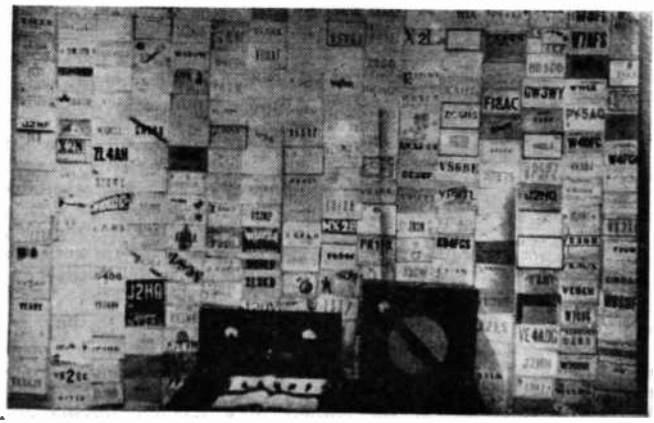
Peter G. Keller, XADZ (Italy) writes to say that the station YI2XG queried in the June issue is definitely OK. He is an R.A.F. Officer stationed at Habbaniya, Iraq, and the QRA is F/Lt. Coombes, S.H.Q. Officers Mess, R.A.F. Station, Habbaniya. The power is only 20/25 watts.

L. A. Singer says that CT2AR (14 Mcs.) is using 300 watts, and the station is operated by LU7FD. QSL's should be sent to S. Dorricott, Departmento-Traccionas FCC, Estacion Rosario, Argentine.

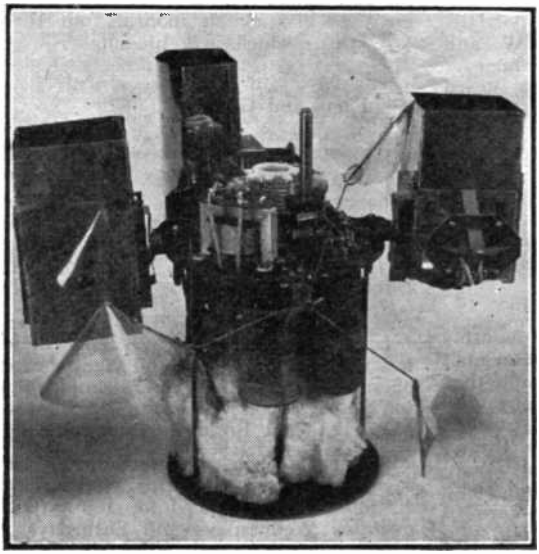
S/Ldr H. Pain, writing from Gibraltar, says he is one of the Ops at ZB2A. The station is now licenced for 100 watts and operates Wednesdays and Saturdays from 1200 onwards, and all day Sundays. Operating mainly on 28 Mcs., ZB2A only needs VK for W.A.C.

Abbey Anderson, ex-GM3TD, is now in Bermuda, and hopes to be on the air soon with a VP9 call. He mentions that VP9F is on 14 Mcs. 'phone, and VP9D is now on 14 and 28 Mcs. CW. Abbey heard some good DX out there and mentions KB6RWZ, XE3AD, OA4R, HK1AG and KF6SWJ on 14 Mcs. 'phone.

John Hawkins supplies the QRA's of: VP9F, Richard Fox, St. Davids Island, Bermuda; VO6G, Postmaster, Goose Bay, Labrador; PZ1A, Box 697, Paramaribo.



The den of Arthur Hamilton, BSWL 24, a regular contributor, from a 'photo taken during the latter part of the war. We would be pleased to publish YOUR 'photo, and will present you with the block.



"RADIO SONDE"

Application of Radio to the Measurement of Temperature, Humidity, and Winds in the Upper Atmosphere.

Editorial Note. In our July number we dealt very briefly with the influence 'temperature inversions' have on VHF propagation. This article, which has been prepared for us by the National Physical Laboratory, describes the Radio Sonde, an instrument used for investigating upper atmosphere conditions, and also a new direction finder used with these miniature radio transmitters.

WITH the rapid strides made in aviation during the war, the need for an hour-to-hour knowledge of meteorological conditions in the upper air becomes of considerable importance. Equally, too, the forecaster required—and still demands—similar information to help him in predicting weather conditions at high levels as well as on the ground. Radio is playing a great part in providing this appreciation of the current weather situation at all heights up to some 50 or 60,000 ft.

At a number of stations situated in the British Isles and elsewhere small radio transmitters operating on a wavelength of about 11 metres and weighing 3 to 4 lbs. (Figs. 1 and 2) are sent up by balloons at six-hourly intervals. The balloons ascend at about 1,200 ft. a minute and burst generally at around 50,000 ft. although a few go as high as 70,000 ft. The transmitter is returned to earth by means of a parachute; is frequently recovered by the general public and after reconditioning, is used again.

During its flight three musical tones are emitted in sequence, the pitch of each tone varies as the balloon ascends and from measurements, on the ground, of the precise frequencies, graphs can be drawn showing the variation of pressure, temperature and humidity with height. A small carefully designed, pre-calibrated barometer, thermometer and hygrometer carried by each transmitter enables this to be done. Each meteorological element is associated with an audio frequency tuned circuit forming part of an oscillator and these three circuits are switched into operation one after the other by a light-weight windmill mounted on the side of the transmitter, thus providing the sequence of musical tones already mentioned. The frequencies are measured by means of a calibrated oscillator in conjunction with a cathode ray tube.

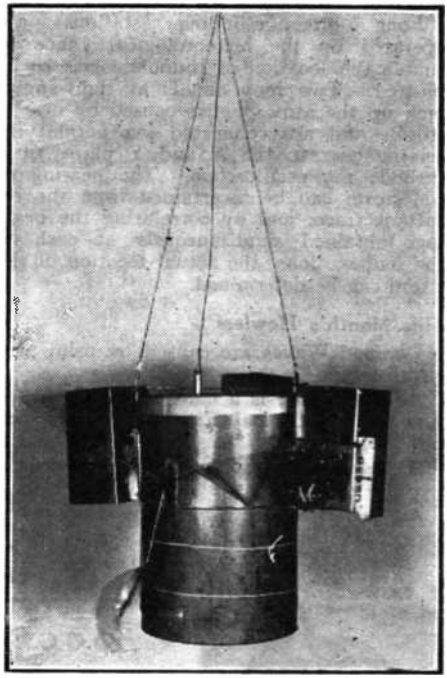
We must now explain how the wind velocity is measured. Each ground station comprises three direction finders, arranged at the corners of a triangle having 20-30

mile sides and grouped around the central station at which the measurements of pressure, temperature and humidity are made and from which the balloon is released. The direction finders (see cover) are of the Adcock type in which two dipoles spaced about 2 metres apart are connected so that the signal picked up on one element tends to cancel that from the other. With careful electrical design it can be arranged that, when the transmitter lies in the plane at right-angles to the line joining the centre of the dipoles, the signal output from the aerial system falls to zero. A specially designed battery-operated receiver is used, and the operator rotates the aerial system and associated frequency-changer unit about a vertical axis until the intensity of the musical tones sent out by the transmitter falls to a minimum value. He then knows the direction in which the balloon lies from him; he reads off the bearing on a large circular scale and by speaking into a microphone suspended from his neck he sends his results by telephone to the centre station at minute intervals. Here the bearings from all three direction finders are plotted on a large scale chart; in this way, by taking account of the height measurements being made simultaneously the minute-by-minute position of the balloon and transmitter is known with considerable precision. Bearing in mind the balloon is carried along at the velocity of the wind, from the chart the wind velocity can be read off at any desired height up to the bursting point of the balloon.

In the future, measurement of wind velocity may be somewhat simplified by using a suitable reflector carried on a balloon, and using a precision high-power radar equipment to track the balloon. With very high wind speeds, however, there are limitations to this method; in any case, the use of light-weight balloon-borne transmitters for measuring pressure, temperature and humidity aloft will continue.

The outline description of the use of radio in upper air investigations given above is just one aspect of a general situation in which workers in the radio and meteorological fields are of increasing assistance to each other.

The direction-finding equipment was developed at the National Physical Laboratory, together with much basic work involved in the design of the balloon-borne transmitter. Further development of the latter and the routine use of the whole equipment has been carried out by staff of the Meteorological Office.



We are indebted to the Controller of H.M. Stationery Office for permission to reproduce the photographs illustrating this article, which are taken from the Meteorological Office publication M.O.462.

S.W.N. REPORT PADS

Owing to pressure on space, we are unfortunately unable to reproduce the specimen page of our report pads, but are now able to give full details.

These pads contain 50 sheets, quarto size, ready ruled for the preparation of detailed reception reports. Instructions on how to utilise the report sheets are given on the cover pages, which are of stiff durable material. The price of the pad is 2/6 each, post free.

We can now accept orders for these pads, and we advise every reader who is interested in short wave reporting to send for his copy at once. By using a "S.W.N." report sheet, you will stand a better chance of getting that coveted QSL card!

All orders, please, to "Short Wave News," 37 Maida Vale, Paddington, London, W.9.

Plotting Thunderstorms.

Four direction-finding stations are operated by the Meteorological Office to enable the location of thunderstorms to be plotted. Two loop aerials at right-angles pick up the atmospherics caused by nearby storms and are connected via normal receiving gear to the X and Y plates of a cathode ray oscilloscope. The bearing of the storm can be ascertained from the resultant trace, and by correlating the bearings obtained simultaneously at each of the four stations, the actual location of the storm can be determined.

This Month's Howlers

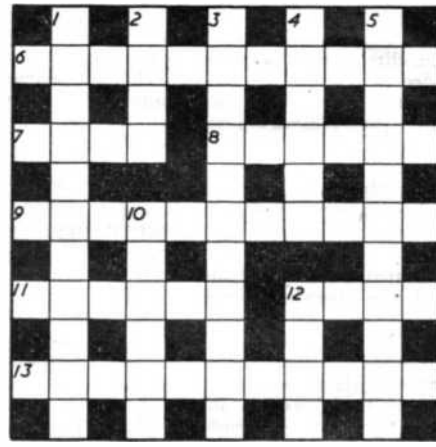
Damped Waves are caused by using wet electrolytics.

An Old Timer is a ham who didn't have to pass a Technical Exam. before he got his ticket.

A Velocity Microphone is the type used for fast speakers.

A Capacitor is a condenser with a superiority complex.

RADIO CROSSWORD No. 6

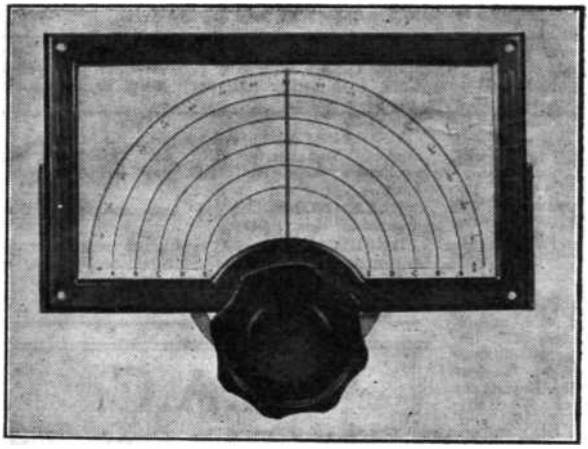


Clues Across:

6. QRT?
7. What every shack should be, but very rarely is.
8. How the elusive DX station was heard?
9. There are millions of them in the short wave spectrum.
11. This should not be allowed to contact other parts of the circuit.
12. This should be the shortest distance two points!
13. The Falklands, South Georgia Islands, etc., are in it.

Clues Down:

1. A task that confronts a constructor/listener after the RX has been built!
2. Supporting the aerial?
3. They help to eliminate interference.
4. One of the curses of DX'ing.
5. Retroactor.
10. Used for a vital component in a TX.
12. The work-bench should have these.



Component Review.

Berry's (Short Wave) Ltd.

The "Q Max" tuning drive illustrated herewith is a nice addition to the very limited range of these components available at the moment. The drive itself is of the friction type, and has a very smooth movement, with a reduction ratio of 9-1. Easy tuning is further helped by the provision of a comfortable knob with a diameter of 2¼ inches. Designed for chassis or baseboard mounting, a slotted bracket allows a variation of half an inch in height, the minimum distance between the capacitor spindle centre and the top of the chassis being 2¼ inches. The scale plate is of stout white celluloid, and could if desired be illuminated from the rear. Six scales are provided, the outermost being divided into 180 degrees with a total length of some 9½ inches. The remaining five, marked A to E, are intended for self-calibration purposes, a most useful feature. Finished in a deep bronze, the escutcheon consists of a metal stamping of simple but neat design, while the protecting glass is of adequate thickness. The complete assembly retails at 15s. 6d.

Measuring Instruments (Pullin) Ltd.

This firm has just introduced a new item in their range of movements, a 2½ inch instrument which we have used in the absorption wavemeter described on page 195 of this issue, and which is clearly shown in one of the illustrations.

The movement incorporates the usual Pullin features. The rustless iron corepiece is part and parcel of the die-cast frame, thus eliminating fixing screws and the risk of movement out of position. Coil pivots are of high carbon content steel, accurately ground and polished, which work in spring-loaded jewel bearings to absorb any shock. Excellent damping is given by the use of a light anodised aluminum coil former. The pointer is also of aluminum, ribbed for strength, and is fitted with a knife edge for close reading, and a flag for distant work. The external zero adjuster is insulated, an important point. The accurancy of these movements is BS 1st grade.

Three types of case are available, round flush, round projecting, and square flush fitting, all in black bakelite. An anti-parallax mirror scale can be provided, to order, at an additional cost of 8s.

These instruments can be obtained with readings of the order of several hundred amperes, but we think the milliameters will most interest our readers. Eight standard ranges are provided, with full scale deflections of 1 mA. (Res. 100 ohms), 5 mA., 10 mA., 50 mA., 100 mA., 250 mA., 500 mA., and 750 mA. A variety sufficient for every need of the amateur transmitter and constructor. The milliameters are all priced at 45s., with the exception of the 1 mA. movement which retails at 55s.

Walkie-Talkies.

It is reported that the G.P.O. will issue licences under certain conditions for radio communications between any two points, on frequencies above 25 Mcs. The mass use of walkie-talkies by the general public, as suggested on numerous occasions by the lay Press, does not seem to be envisaged in the immediate future.

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, Worksop, Notts.

SALE—or part exchange for camera. 30W. Amplifier—£7. Pair KT33C's—10/-. 955, 9004 acorns —15/- each. 832 "door knob—35/-. 6C4 midget triode—7/6. 12 inch speaker (P.M.)—Offers. Box 1007.

LOOK ! C.W. 15 watt TX, 500 volt Pack, Xtals. —15/- each. 832 "door knob"—35/-. 6C4 midget Key, Coils—40-20-10 metres, mA/meters—£17 10s. E.C.O./P.A. TX, new, 25/30 watts 160-80-40-20 metres coils, mA/meter switched—£9 9s. Taylormeter 85A—£19 19s. Taylor 110A Cap/Resistance Bridge—£12 12s. 100s of valves in stock. All Radio and Electrical Components. Contact G3XV for your TX, Power Pack and Modulator requirements. TX Aerial Coupling Unit complete with R.F. Thermoammeter 0-350 mA.—£1 each. R.F. Thermoammeters 0-350 mA.—15s. each. Hamrad Agent.—G3XV, Radio Service Depot, Donnington Wood, Wellington, Salop.

FOR SALE. Cabinet and Gram. Motor, Elect. —£5. WANTED—S'hand R'gram.—Page, 11 Micklethwaite Road, Fulham S.W.6.

BOOKS for the ham! The most comprehensive stock of radio books in the country, including many now out of print. Write, or call, for complete list. (Price 1d.):—Dept. S.3, THE MODERN BOOK CO., 19-23 Praed Street, London, W.2.

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

BACK NUMBERS of this magazine wanted urgently.—Box 1004.

DUPLICATING and typing to requirements at reasonable rates. Club Secretaries—let me duplicate your news-sheets! Send for tariff of rates to: H. Lister, 19 New Street, Pocklington, York.

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