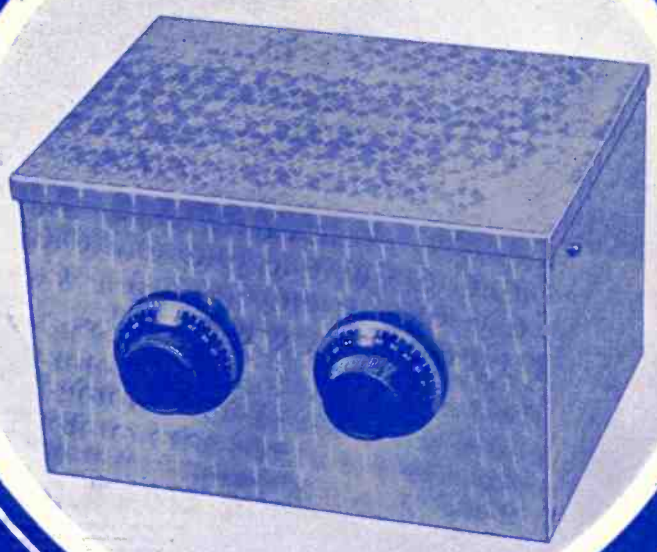
The

SHORT-WAVE MAGAZINE

6D



No. 9

NOVEMBER, 1937

Cover photograph: A 160-metre one-valve battery transmitter; constructional details on pages 34 and 35.

1·7 Mc. Battery Transmitter

For this transmitter there are two very good reasons why the Hivac PX230/SW valve was chosen.

The first and obvious one was the fact that this is one of the valves specially developed by Hivac for Short and Ultra-Short wave work.

The second reason is, that the grid is taken to the top cap and this fact makes it possible to place the crystal and its holder where it is easily accessible and can be removed or exchanged when it is desired to work on other frequencies.

HIVAC
Special S/W. Valves

D 210 S.W.	... 5/6
SG 220 S.W.	... 12/6
PX 230 S.W.	**... 12/-**

As specified for the 1.7 mc. Battery Transmitter.

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BRITISH MADE

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Please send me details of the full range of your valves, also a FREE copy of your Replacement Chart, "S.M."

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S.M. .....

READERS' ADVERTISEMENTS—See page three.

CLASSIFIED ADVERTISEMENTS

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Cheques and postal orders should be made payable to "The Short-Wave Magazine."

THE SHORT-WAVE MAGAZINE

Vol. 1 NOVEMBER 1937 No. 9

Editor: BASIL WARDMAN (G5GQ) Editorial Asst.: S. W. CLARK

Advertisement Manager: C. T. MILDENHALL

APOLOGY

WE ALL HATE making mistakes, but we are not perfect and so the inevitable has happened. Last month we under estimated the probable sales of THE SHORT-WAVE MAGAZINE, with the result that between 1,100 and 1,200 of our readers were unable to obtain copies.

You, Mr. Reader, order your copy from the local newsagent, who in turn orders it from one of the large wholesale houses, the bulk orders then being passed to us. During the month preceding publication these orders arrive, and from them we decide the number of copies to be printed. Of course we allow a surplus for repeat orders, our actual figure being around 750.

Last month winter time started, causing an expected rise in our orders. A larger number of surplus copies was printed, but within a week not only were these sold, but demands were received for a further 1,100 copies which we were unable to supply.

Why not print some thousands in excess of our orders? Because every unsold copy represents a loss, and a loss entails reduction of the quality of the contents, or in other words it is borne both by the magazine and its readers. Hence we try to estimate so that our remaining stock is only sufficient to cope with the demands for "back numbers."

We all know the old story, "Order your copy in advance because owing to unprecedented demands, etc.": it's a well-known sales gag, and as such is discounted by all intelligent folk. But the fact remains that many readers were disappointed last month, and so we would appreciate it if you would indicate to your newsagent that you may be requiring a copy next month. It will help you, your newsagent (who gets the blame for things beyond his control), and enable us to maintain the high standard of quality which we have set.

We apologise to those who were unable to obtain copies, and offer the above as an explanation, not as an excuse.

READERS' ADVERTISEMENTS

A number of readers have written asking us to start a column for private advertisements. This is already covered by our "Classified Advertisement" section, which is available to both private and business advertisers, the charge being twopence per word.

So far few private advertisers have made use of this section, perhaps because they do not like their advertisements placed with those of dealers. It is suggested, therefore, that a separate column be devoted to "Readers' Bargains."

The proposed column will be for private readers only, from whom we shall be pleased to receive comments.

Contributions for publication in our editorial pages will be given consideration and payment will be made for matter used. Only manuscript accompanied by a stamped, addressed envelope will be returned. Whilst we are willing to advise on suggested articles no guarantee of acceptance can be given.

The publisher does not necessarily agree with the views expressed by all correspondents and contributors, the aim being to open the columns to every phase of opinion.

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HAVE YOU HEARD . . . ?

An abstract of the past month's conditions, as compiled and presented by

F. A. BEANE (2CUB)

THERE IS little doubt about it; we of the dx fraternity have been favoured of late. Maybe conditions haven't been perfect—are they ever?—but we have been presented with golden opportunities to make ourselves known to new countries and stations, and if these opportunities are neglected there may never be another chance, such as in the case of the Abyssinian broadcasts or KNRA on board the schooner *Seth Parker*. Still, I was fortunate enough to get verifications from both—but that's a different story.

As an illustration: KZRM was reported in a contemporary and so I listened desperately to get it and succeeded in hearing it twice only; since, however, it seems to have disappeared entirely! Therefore, I am giving below a few hints on what to listen for NOW!

● Latin America Predominates

This news concerns Latin America principally, a continent from whence we always derive something new. Stations come and go; some habitually wander from one channel to another as they please, displaying complete disregard to all laws governing the distribution of frequencies. They imitate their more powerful American "neighbours" and intersperse their commercial propaganda in like manner, but who cares? After all some of them do behave and they *do* make news!

Chief limelight, at the time of writing, is centred on the Martinique FZF6 of Fort-de-France, which I have succeeded in hearing almost nightly on 30.98 m. Programmes are commenced at 23.45 with the "Marseillaise," French announcement, generally as "Allo, allo, ici Radio Martinique" and a brief news bulletin, then follows gramophone music of typical French songs and accordion music and finally at 00.45 a quadri-lingual announcement, request for reception reports and comments and close with the familiar, aforementioned anthem. Naturally the major proportion of the announcements are in French, given by a male, but at the close we are favoured with Spanish, English and German calls in that order, and, incilentally, a lady generally undertakes the last two languages. Reports should be addressed to "Radio Martinque, Boite Postal 136, Fort-de-France, Martinique, F.W.I."

This diminutive French possession does not command all of the glare of publicity, however, since South America is vying for predominance with quite a number of newcomers or revitalized acquaintances of old. Amongst the latter is HJ7ABB (or ABD), "Radio Bucaramanga," Bucaramanga, Colombia, operating on 31.17 m. approx., just slightly lower than HJ2ABP in wavelength. Strength is excellent and quality leaves little to be desired.

HJ2ABD was operating on that frequency at the beginning of the year, with the same title "Radio Bucaramanga" (I have confirmation of this from the owners) and it appears that the newcomer is either HJ2ABD with a new call-sign for the 31 m. band, or an entirely new station in the same city appropriating HJ2ABD's slogan. The extraordinary thing about it is that an HJ2 and HJ7 should originate from the same city. The call HJ7ABB has been heard many times in Spanish, also in English. For further particulars of HJ2ABD turn to the identification panels elsewhere. I can guarantee it to be a prompt verifier.

Quite recently I tuned aimlessly in the vicinity of 49.75 m., the time was 21.37, when to my surprise I discovered an obvious Latin-American with quality and modulation very reminiscent of PRA8, aptly termed, by a great friend of mine, "the distorted wanderer," and I immediately convinced myself that it really was the Brazilian. However careful listening to the numerous announcements revealed (1) that it was Spanish not Portuguese speech being heard (2) much reference to Buenos Aires (3) a call which appeared to be "Radio ——, Villarica, Paraguay." By 23.00, when it signed-off with a studio clock striking seven and the playing of the Sousa March "Stars and Stripes," I had gathered sufficient evidence to prove that it was, indeed, a new Paraguay station. Now Paraguay is a conspicuous absentee from most logs, so there's another chance for you to distinguish yourself as a dx'er. By the way I haven't the address of this station, but I have mailed my report to "Estacion Onda Corta ??, Villarica, Paraguay," and meanwhile I am praying fervently for its safe arrival!

● Argentine or Uruguay?

Yet another mystery-brewing station is to be found in the region of 31.1 m. From announcements it appears to be "Radio Belgrano" of Buenos Aires, but I should not be unduly surprised it it eventually turned out to be a Uruguayan relaying a Buenos Aires station, quite a normal occurrence. However, on the other hand, everything points to the transmissions originating from a short-wave station actually in Buenos Aires! Having done my utmost to avoid compromise I will, like a certain statesman, wait and see!

Possibly some of my readers may consider my last article a little misleading, and, I must confess, in some ways it was! CB1170, which I introduced as being on 25.5 m., made a sad lapse in moving to its

assigned frequency of 11,700 kc. at a time when it was too late to modify the article. Now the Chilian seriously interferes with HP5A of Panama City, original occupier of the channel, but, of course, by the time this news is read it may be elsewhere!

● Canada steps in

Fortunately the latest activities in the short-wave broadcasting sphere are not confined to Latin America alone, although, geographically, the next news item comes from the same continent. On almost any night a station in Sydney, Nova Scotia, Canada, may be heard on an announced wavelength of 49.9 m., 6,010 kc., from about 21.27, or possibly earlier. The call-sign is CJCB, but it is reported that this is actually the call of the m.w. station from whence the programmes are taken, and that the s.w. letters are CJCG. So far, however, I have only heard mention of CJCB, generally as "This is station CJCB, Sydney, Nova Scotia," while at 23.15 may be heard a daily news bulletin. Reports are requested but no address is given as far as I can ascertain, although "Short-Wave Station CJCB, Sydney, Nova Scotia, Canada" should suffice. An extraordinary thing about these Canadian stations is that they never appear consistently in this country for any great length of time. During the last few years I have logged such broadcasters as VE9HX, VE9BJ, VE9AS, VE9GW (now CRCX), VE9DR (now CFCX) and VE9DN, but now few of these are seldom, if ever, heard. VE9BJ is definitely obsolete; VE9AS occasionally crops up as an amateur station—operated by the University of New Brunswick; VE9DN only operates during the winter for conveying messages to settlers in the Far North while VE9HX, CRCX and CFCX only appear spasmodically. I am (almost) prepared to wager that CJCB will wane likewise, but I must remember that Canadian broadcast reception generally improves at this time of the year!

● The Ultra High Frequencies Again

Due to the fascination of logging South African amateur telephony stations I have found it extremely difficult to tear myself away from 10 metres and to concentrate on the numerous broadcasters found below this band. However, on one or two occasions I managed to capture a few calls when they momentarily disengaged themselves from the jumble of 9.454 m. W3XEY of Baltimore is one of the strongest stations intelligible, closely followed by W2XDV and W9XHW, but so far I have heard nothing on 8.43 m. this season.

Writing of high frequencies reminds me of a query raised by a reader—L.M. of Portsmouth—with regard to my remarks in my last article about the "second harmonic" of W2XAD. He writes "Will you please give a definite ruling in the next S.-W. MAG. to clarify our difference of opinion here on your reference to harmonics. Do you call the fundamental frequency the *first* harmonic of a transmitter?" Depends which way you look at it. If you count the harmonics the first one will be on double the frequency, i.e., 9.78 m. But harmonics are generally termed by their multiple relationship: double the frequency being termed the second harmonic (9.78 m. in this case), treble the frequency the third harmonic. On this reckoning the first harmonic would be the fundamental times one, i.e., still the fundamental, so there cannot be a first harmonic.

● Uruguay Challenge to Paraguay

Shortly after writing the first part of this article I was both astonished and pleased to discover a Uruguay station operating in the region of 50 m., 6,000 kc., at about 23.00. Dance music, obviously from recordings, was played almost incessantly except for brief announcements in Spanish and once in French at about 6-minute intervals. Unfortunately a particularly severe bout of c.w. seriously marred the transmission at 23.15 and rendered it practically unintelligible, although suffiicent data was secured to show that the station was an experimental one with the call CXA2, situated in Montevideo, Uruguay. Reports would, no doubt, be appreciated and should be sent to "Radio-difusora CXA2, Compania de Publicidad Continental, Rio Negro 1631, Montevideo, Uruguay." Programmes are concluded with that popular closing number—the Ted Lewis "Good Night Song."

Just to refresh my memory and to modify my log of identification signals, I recently listened until 04.15 and was delighted to find many old favourites cleaving to the ether as of old. The QRN usually associated with summery weather had waned considerably and little difficulty was experienced in logging such stations as HJ4ABB (49.10 m.), HJ4ABH (31.51 m.), HJ3ABH (49.90 m.), HJ3ABX (49 m.), HJ1ABG (49.65 m.), HP5J—still on 31.23 m. despite reports to the contrary, and many of the Venezuelans. For variety and excitement I certainly recommend readers to comb the 31- and 49-metre bands after about 23.00 when they have just livened up and are generally free from local station monopoly.

● War Stations Again

Many listeners have been puzzled by a "Radio Nacional de Espana" on about 29 m. Actually all insurgent stations take this programme, which, presumably; originates in Valencia and the station near 29 m. appears to be "Radio Salamanca," officially working on 28.2 m. EAJ43 (28.93 m.), EA9AH and many other stations may be heard with the same programme for, according to the English announcer, the programme is "transmitted on all short-*wavelength.*" Another station styling itself "Radio Guardia Civil de Tetuan, Marruecos Espanol" is to be heard on about 45 m. until 22.00 when they close with much lauding of Franco and rebel songs and anthems. Quality is poor and gong notes are used at intervals.

Other stations to search for are YSN, San Salvador, which is said to be testing in the 25-metre band; HH2S (50.85 m.) of Port-au-Prince, Haiti, often well heard until 02.30 with 4-note identification

(*Continued on page* 25.)

From S.W.L. to Full Licence—3.

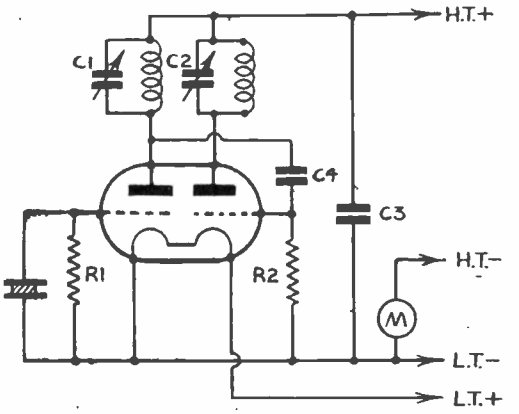
By CHARLES WHEELER

LAST MONTH I wrote about a simple triode oscillator, and my first experiments with a radio transmitter. Well, a one-band rig was very thrilling, but after the novelty of listening to a carrier, which I was controlling myself, wore off, I had visions of multi-band transmitters, with valves in push-pull, and all the rest of it. Then I remembered the way I was brought back to earth last month, and realised that it would be as well to start with the simplest circuit possible, and work up to a complex one later on..

By the way, the circuit I gave last month used a PX230 valve as described in the text, and not a UU60/250, which unfortunately appeared in the diagram.

● Doubler Considerations

The use of a doubler is, at its name suggests, to double the frequency upon which you transmit. This is accomplished by taking the output from the



oscillator coil, not to the aerial but to the valve of the doubler stage. A plate tuning circuit similar to that in the oscillator is used, but this time the coil is a twenty-metre one. I was using an Eddystone coil with eight turns on an inch-and-a-half former for the oscillator, so the corresponding 20 m. coil (with four turns) was used in the doubler. The value of the condenser is not very important, but if too large a one is used the point of maximum efficiency is found too near one end of the dial, that is, it must be tuned to practically its minimum capacity. Consequently, a very small one, such as a 25 mmfd. is found to be convenient.

Most of the components can be varied, and different values are found to make little difference. The leads from one component to another can, for the most part, be as long as you like, but in both cases there are one or two exceptions. The first which I mentioned, that of the tuning condenser C1 is more a matter of convenience than necessity, but C4 is rather different. It caused my first spot of bother in fact, I used a fairly large value, a .05, and the doubler didn't double! However, after checking everything else in the set I came to C4, and found that the trouble was remedied by using a .0001.

● Layout

The next matter was that of the resistance R2 which unlike R1 is rather critical. With a big value like one meg. which was my first effort, a very poor reading in the milliameter was found. However, various lower values were tried, and a .05 meg. proved to be somewhat nearer the mark.

With regard to connections, an important one is that from the by-pass condenser to the coil: this lead must be kept as short as possible, in fact the condenser should be joined directly on to the coil-holder. It was my idea that the two variable condensers should be as far apart as possible, but afterwards I learned that is not so. They can be placed side by side, and their spindles joined by a short lead, and leads from each taken to their respective coil holders. Be sure that you use the correct two pins, and not one belonging to one coil and one to the other, for it is the little apparently unimportant things like that which manage to cause a lot of trouble.

Tuning the doubler is quite a simple matter, and by watching your meter, can be very accurate. First, I tuned the oscillator until the meter kicked, reading 35 mils, then repeated the procedure with the second stage, and obtained about 40% of that current. And so our doubler was built; but quite a considerable time further was spent in tidying up wiring and trying the effect of other components, etc.

● Tuning

Using a "362" BA2 valve (costing 6s.), I rigged up the circuit, and found it a very nice little class B job. As you know a class B valve consists of two triodes in one envelope. The first was, in this case, used as an oscillator and the second as a doubler.

Tuning procedure was exactly the same as with two triodes, and the result a rather more efficient transmitter, in a neater form. The valve has a

(*Continued on page* 25.)

BROADCAST PROGRAMMES FOR NOVEMBER

(a) W2XE (Wayne) .. .. 21,520 kc, 13.9 m.
(b) ,, ... 15,270 kc, 19.6 m.
(c) W2XAD (Schenectady) ... .. 15,330 kc, 19.5 m.
(d) W3XAU (Philadelphia) ... ... 9,590 kc, 31.2 m.
(e) ,, ... 6,060 kc, 49.5 m.
(f) W3XAL (Boundbrook) ... ... 17,780 kc, 16.8 m.
(g) W2XAF (Schenectady) ... ... 9,530 kc, 31.5 m.
(h) 2RO (Rome) ... ... 11,810 kc, 25.4 m.
(i) W2XE (Wayne) .. .. 11,830 kc, 31.13 m.
(j) TPA2 (Paris) ... . 15,243 kc, 19.68 m.
(k) TPA3 ... ... 11,885 kc, 25.27 m.
(l) TPA4 ... ... 11,720 kc, 25.60 m.
(m) W1XAL (Boston) ... ... 11,790 kc, 25.45 m.
(n) ,, ... 6,040 kc, 49.67 m.
(o) OLR4A (Praha) ... . .. 11,840 kc, 25.34 m.
(p) 2RO (Rome) ... ... 9635 kc, 31.13 m.

All times G.M.T. Only those features which are presented throughout the month on the same day each week are given.

SUNDAY

a.m.
9.00 News in French, English and Italian (daily) (k)
11.00 Concert—relayed (daily) (j)
11.43 Various Programmes from Italian Stations (daily) (h)
p.m
12.00 News in English (daily) (j)
12.15 Concert—relayed (daily) (j)
1.00 Organ Reveille (a)
1.20 Mediterranean Hour (daily) (h)
1.30 Lyric Serenade (a)
1.45 Radio Spotlight—The Week in Preview and News of the Stars (a)
2.00 "Coast to Coast on a Bus"—programme for Children with Milton Cross (f)
2.00 "Sunday at Aunt Susan's"—Children's Programme (a)
2.20 Gramophone Records (daily) (j)
2.30 Concert—relayed (daily) (j)
2.55 Press Radio News (a)
3.00 Russian Melodies, directed by Alexander Kiriloff (f)
3.30 Walburg Brown, String Ensemble (f)
4.00 Press Radio News (f)
4.05 Ward and Muzzey—Piano duo (c)
4.15 Bravest of the Brave (c)
4.20 Varied Programme for Italian East Africa (h)
5.00 Dorothy Dreslin—Soprano (c)
5.00 Concert relayed (daily) (k)
5.15 Chimes and Church Service (m)
5.30 Salt Lake City Tabernacle Choir and Organ (d)
5.30 Radio City Music Hall (f)
6.00 Church of the Air (b)
6.20 Varied Proramme from Italian Stations (p)
6.30 Dreams of Long Ago (f)
6.45 Poet's Gold — David Ross and Orchestra (d)
7.00 Magic Key Symphony Orchestra, directed by Frank Black (f)
7.30 The Widow's Sons (c)
7.30 Call Letters (daily) (o)
7.40 Dance Music or Gramophone Records (daily) (o)
8.00 Radio Newsreel (c)
8.00 Everybody's Music—Howard Barlow and Columbia Symphony Orchestra (b)
8.00 News in German and French (daily) (o)
8.25 Variety Programme (o)
8.30 Bicycle Party (c)
9.00 Romance Melodies (c and g)
9.00 News in English (daily) (o)
9.05 Military Band (o)
9.30 Variety Show with Jerry Sears (f)
9.30 The World Is Yours (c and g)
10.00 Marion Talley—Soprano (c and g)
10.30 The Time of Your Life (c and g)
11.00 Catholic Hour (c and g)
11.00 Joe Penner with Jimmy Grier's Orchestra (o)
11.15 Concert from Radio Paris (l)
11.30 A Tale of To-day (c and g)
a.m.
12.00 Jack Benny and Mary Livingstone (from Hollywood) (c and g)
12.45 Morin sisters and Ranch boys (c and g)
1.00 "1937 Edition of Twin Stars," Victor Moore & Helen Broderick (e)
1.00 Variety Programme with Don Ameche (c and g)

MONDAY

p.m.
12.30 Fiddlers Fancy (a)
1.00 Morning Almanack with Phil Cook (a)
1.30 Jack Shannon—Songs (a)
1.45 Leon Goldman—Violinist (a)
2.00 Near and Far East—News in English and Italian, and Concert of Music (daily, except Sunday) (h)
2.00 Breakfast Club Orchestra (f)
2.00 Metropolitan Parade (a)
2.10 French Women's Chronicle—by Mrs. Decaris (j)
2.30 Jack Berch and his Boys (a)
2.45 Bachelors' Children (daily, except Sunday) (a)
2.45 Press Radio News (daily, except Saturday and Sunday) (f)
3.00 Sweethearts of the air (f)
3.15 "Ma Perkins"—dramatic sketch (daily, except Saturday and Sunday) (f)
3.30 Dramatic sketch—Old Man of the Mountain (daily, except Sunday) (f)
4.00 Honeymooners—Songs (daily except Sunday and Wednesday) (f)
4.00 David Harem (c)
4.15 Three Majors—Vocal Trio (daily, except Saturday and Sunday) (f)
4.20 Italian East Africa—News in Italian; Orchestral and Vocal Concert (daily, except Sunday) (h)
4.30 Herman and Banta—Piano duo (f)
4.45 Manhatters Dance Band (f)
5.00 Mary Margaret McBride—Columnist (b)
5.00 Happy Jack—Songs (c)
5.15 Your News Parade (daily, except Saturday and Sunday) (d)
5.30 WGY Farm Programme (daily except Sunday) (c)
5.30 "Romance of Helen Trent"—Dramatic Sketch (daily, except Saturday and Sunday) (d)
5.30 Arabian Hour—News in Arabic; Concert of Arabic Music (daily, except Sunday) (p)
5.45 "Our Gal Sunday"—Dramatic Sketch (daily, except Sunday) (d)
6.00 Joe White—Tenor (c and g)
6.00 Gold Medal Hour—"Betty and Bob"—Dramatic Sketch, and Hollywood in Person (daily, except Saturday and Sunday (d)
6.15 Words and Music (c)
6.40 News in German (daily, except Sunday) (h)
6.45 Dan Harding's Wife (daily, except Saturday and Sunday) (c)
6.45 Aunt Jenny's Real Life Stories (daily, except Sunday) (d)
6.55 News in French (daily, except Sunday) (p)
7.00 Big Sister (d)
7.10 Varied Programme from Italian Stations (daily, except Sunday) (i)
7.15 Jack and Loretta—Songs and Patter (daily, except Sunday) (d)
7.30 Romany Trail (d)
8.00 Colonel Jack Major's Variety Show (b and d)
8.00 Pepper Young's Family (daily, except Saturday and Sunday) (c)
8.15 Ma Perkins (daily, except Saturday and Sunday) (c)
8.30 Vic and Sade (daily, except Saturday and Sunday) (c)
8.30 Relay (k)
8.30 "Pop" Concert, directed by Howard Barlow (b and d)
9.00 Lorenzo Jones (daily, except Saturday and Sunday (c)
9.00 Bob Byron—"Swing" Whistler, Piano and Patter (b and d)
9.05 Popular Concert of Light Music (daily, except Sunday) (o)
9.15 Music from the Gold Coast (b and d)
9.15 Club Matinee—Variety (f)
9.50 Rebroadcast Feature Hour (daily, except Sunday) (m)
10.00 Press Radio News (f)
10.00 Follow the Moon (b and d)
10.15 "Life of Mary Sothern" Dramatic Sketch (daily, except Saturday and Sunday) (b and d)
10.30 Doris Kerr—Songs (b and d)
10.45 Little Orphan Annie (c and g)
10.45 Dorothy Gordon's "Children's Corner" (b and d)
11.00 News Reporter (daily, except Sunday) (f)
11.00 American Hour—News in Italian and English; Opera; 2RO Mail Bag (p)
11.00 Howard Phillips—Baritone (d)
11.00 The Monitor views the News (daily, except Sunday) (m)
11.15 News in English (daily, except Sunday) (h)
11.15 Gramophone Records (l)
11.30 Press Radio News (daily, except Sunday) (c and g)
11.30 Press Radio News (daily, except Sunday) (f)
11.35 Three X Sisters (f)
11.35 George Hall's Orchestra (daily, except Sunday) (d)
a.m.
12.00 Amos 'n' Andy (c and g)
12.00 Poetic Melodies (daily, except Sunday) (d)
12.15 Song Time—Hollace Shaw and Ray Heatherton (d)
12.30 Jay Freeman and his Orchestra (d)
12.45 Boake Carter (d)
2.00 Radio Theatre—Dramatic and Musical (e)

(Continued on page 10.)

GUIDE TO THE WORLD'S SHORT-WAVE BROADCASTERS

(listed by Continent)

Compiled for "The Short-Wave Magazine" by F. A. BEANE (2CUB)

All times are given in G.M.T. for convenience.

MODIFICATIONS (October)

COBC—Verifies with handsome card, giving frequency as 9.35 mcs., or 32.09 m.

ERRATA

HJ1ABB—Should have read "relays HJ1ABA." Distance from London approximately 4,500 miles.

LATIN AMERICA

HJ1ABC, QUIBDO (Colombia)

Metres: 50. Kilocycles: 6,000.
Power: Believed to be 1,000 watts.

Operating schedule: 23.00—02.00 daily—possibly discontinued.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,550 miles.

Postal address: "Radiodifusora HJ1ABC, Quibdo, Colombia."

Identification characteristics: Reference to the slogan "La Voz del Choco"; 2 chimes; programmes commenced and concluded with march "Relator." Station operated by Department of Education.

Verification of reception reports: Believed to confirm by QSL card.

HJ1ABG, BARRANQUILLA (Colombia)

Metres: 50. Kilocycles: 6,042·5. Power: 1,000 w.

Operating schedule: 16.00—04.00 weekdays; 16.00—01.00 Sundays.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,500 miles.

Postal address: "Emisora Atlantico HJ1ABG Apartado 445, Barranquilla, Colombia."

Identification characteristics: 4 chimes every fifteen minutes coupled to call "Estaciones HJ1ABG, Emisora Atlantico, y HJ1ABH en Barranquilla, Colombia." Single chime between announcements: occasional English announcements; frequent mention of Barranquilla and slogan "Emisora Atlantico."

Verification of reception reports: Verifies with modest card.

HJ1ABJ, SANTA MARTA (Colombia)

Metres: 49.8. Kilocycles: 6,024. Power: 1,500 w.

Operating schedule: 16.30—19.00 and 22.30—03.30 (or 04.00) daily.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,460 miles.

Postal address: "Radiodifusora HJ1ABJ, La Voz de Santa Marta, Santa Marta, Colombia."

Identification characteristics: Reference to the title "La Voz de Santa Marta." 3 chimes like N.B.C. before call and chimes between announcements. Occasionally employs English. Closes with organ recording.

Verification of reception reports: Verifies with QSL, but sometimes difficult to obtain.

HJ1ABP, CARTAGENA (Colombia)

Metres: 31.21. Kilocycles: 9,612.
Power: Believed to be 1,000 watts.

Operating schedule: 12.00—14.00; 16.00—17.30 and 22.00—03.30 daily.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,550 miles.

Postal address: "Radiodifusora HJ1ABP, Apartado 37, Cartagena, Colombia."

Identification characteristics: Commences and concludes programmes with the Sousa March "Under the Double Eagle"; refers to "Radio Cartagena" (phon. Carta-heyna). often. Chimes, usually five, are heard at 15 minute intervals, coupled to the call "Radio Cartagena, Estaciones HJ1ABP y HJ1ABR en Cartagena, Republica Colombia." Occasionally in English as "You are listening to HJ1ABP and HJ1ABR in Cartagena, Colombia, South America." Two chimes interrupt announcements, while a bugle call is heard frequently.

Verification of reception reports: Confirms reception with attractive card.

HJ2ABC, CUCUTA (Colombia)

Metres: 31.35. Kilocycles: 9,570.

Power: Believed to be 1,000 watts.

Operating schedule: 16.00—17.00 and 23.00—02.30 daily.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,550 miles.

Postal address: "Radiodifusora HJ2ABC, P. Sanchez C., Cutuca, Colombia."

Identification characteristics: Chimes and slogan "La Voz de Cucuta."

Verification of reception reports: Unknown.

HJ2ABD, BUCARAMANGA (Colombia)

Metres: 31.17 (or 50.10). Kilocycles: 9,621 (or 5,980) Power: 1,000 watts.

Operating schedule: 16.30—17.30; 22.30—23.30 and 00.30—03.30 daily. On 31.17 m. at present; official wavelength for this band 31.32 m.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,600 miles.

Postal address: "Radiodifusora HJ2ABD, Hector McCormick, Calle 2A, No. 1205, Bucaramanga, Colombia."

Identification characteristics: Mentions "Radio Bucaramanga" often. Full call generally given as "Radio Bucaramanga, Estacion HJ2ABD en Bucaramanga, America del Sud." Does not appear to use English or identification signal.

Verification of reception reports: Confirms with same card, bearing map of Colombia, for both wavelengths.

HJ3ABD, BOGOTA (Colombia)

Metres: 61.90 (originally 49.55).
Kilocycles: 4,841 (originally 6,055).
Power: 1,000 watts.

Operating schedule: 14.30—20.00 and 00.00—05.00 daily.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,780 miles.

Postal address: "Radiodifusora HJ3ABD, Apartado 509, Bogota, Colombia."

Identification characteristics: Announces frequently as "Colombia Broadcasting." No interval signal or English used. Signs off with pasodobla "Rio Rita" and National Anthem.

Verification of reception reports: Confirms reception with unattractive card.

HJ3ABF, BOGOTA (Colombia)

Metres: 48.62. Kilocycles: 6,170.
Power: Believed to be 1,000 watts.

Operating schedule: 16.00—19.00 and 23.00—04.00 daily.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,780 miles.

Postal address: "Radiodifusora HJ3ABF, Apartado 317, Bogota, Colombia."

Identification characteristics: 6 chimes, usually at 15 minute intervals, coupled to the slogan "La Voz de Bogota."

Verification of reception reports: Notorious for persistently ignoring all reports. Reply Coupons should be withheld.

HJ3ABH, BOGOTA (Colombia)

Metres: 49.90. Kilocycles: 6,012. Power: 1,200 w.

Operating schedule: 16.30—18.00 and 23.00—04.00 weekdays; 17.00—19.00 and 21.00—02.00 Sundays.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,780 miles.

Postal address: "Radiodifusora HJ3ABH, Apartado 565, Bogota, Colombia."

Identification characteristics: 3 chimes like N.B.C. and call "Estacion HJ3ABH, La Voz de la Victor, en Bogota, Columbia, Sur America."

Verification of reception reports: Sends a neat card bearing call letters in red. Original card depicted studios, transmitter, etc.

HJ3ABX, BOGOTA (Colombia)

Metres: 49.00. Kilocycles: 6,122.

Power: Believed to be 1,000 watts.

Operating schedule: 15.30—19.00 and 22.30—04.30 weekdays; 17.00—18.30 and 23.00—04.00 Sundays, that is until 04.00 Monday morning.

Standard time: G.M.T. less 5 hours.

Distance from London: Approximately 4,780 miles.

Postal address: "Estaciones HJ3ABX, Apartado No. 26-65, Bogota, Colombia."

Identification characteristics: Chimes, possibly 7 or 8, at each quarter hour, and slogan "La Voz de Colombia." Occasional bugle call.

Verification of reception reports: Sends card depicting Statue of Liberty and call in red letters.

TUESDAY

p.m.
2.00 "Dear Columbia" — Fan Mail Dramatization (a)
2.10 Social Topics, by Mr. Rives (j)
2.25 Press Radio News (a)
2.30 Richard Maxwell—Tenor Philosopher (a)
2.45 Press Radio News (f)
5.00 The Rythmaires (d)
5.15 Your News Parade (d)
6.00 The Escorts and Betty (c)
7.00 Molly Steinberg—Stage Relief Speaker (d)
7.30 N.B.C. Music Guild (f)
7.30 Dalton Brothers—Vocal Trio (d)
8.00 Theatre Matinee (b and d)
8.30 "Pop" Concert (b and d)
8.45 Have You Heard?—Dramatization of Interesting Facts (f)
9.00 Bob Byron—"Swing" Whistler, Piano and Patter (b and d)
9.15 The Novelteers (b and d)
9.30 Club Matinee—Variety Show (f)
10.15 Choir Symphonette (c and g)
10.30 St. Louis Syncopators (b and d)
10.45 Children's Hour (d)
11.00 News in English (p)
11.20 Latin American Hour (i)
11.35 Short Wave Mail Bag (c and g)
11.45 George Hall's Orchestra (b and d)
12.00 Amos 'n' Andy (c and g)
a.m.
12.15 Song Time with Ruth Carhart and Bill Perry (d)
1.00 Blue Velvet Music (d)
1.30 Wayne King's Serenade (c and g)
1.30 Al Jolson Show with Martha Raye (d)
2.00 "Watch the Fun Go By," presenting Al Pearce and His Gang; Nick Lucas, Singing Guitarist; Arline Harris, "Human Chatterbox," with Carl Hoff's Orchestra (e)
2.30 Benny Goodman's Swing School—Pat O'Malley and Guest (e)

WEDNESDAY

p.m.
1.00 Morning Almanack with Phil Cook (a)
1.30 Green Field Village Chapel (a)
1.45 Sydney Raphael—Pianist (a)
2.00 As You Like it (a)
2.30 Richard Maxwell—Songs of Comfort and Cheer (a)
3.00 Sweethearts of the air (f)
3.45 Viennese Ensemble (f)
4.45 Hello Peggy (c)
5.00 Cheri and the Three Notes (d)
6.00 Three Rancheros (c)
6.00 Make Believe—Ruth Carhart, contralto; Bill Perry, tenor; Novelty Orchestra (d)
6.45 Hollywood in person (d)
7.00 News Through a Woman's Eyes (d)
7.30 Montana Slim—Yodelling Cowboy (b and d)
8.00 Manhattan Matinee—Variety Programme (b and d)
8.15 Continental Varieties with Celia Branz (Contralto) (f)
8.30 Current Questions Before the House (b and d)
8.45 Academy of Medicine (b and d)
9.00 Club Matinee (f)
9.30 Russell Dorr—Baritone (b and d)
9.45 Dr. Allan Roy Dafoe (b and d)
10.00 Follow the Moon (b and d)
10.30 Jack Armstrong (c and g)
10.45 Funny Things—Nora Stirling (b and d)
11.00 North American Hour—News in English (p)
11.00 Jack Shannon—Songs (d)
11.05 Harry Kogen and His Orchestra (f)
11.15 Four Stars—Rhythm Quartet (d)
11.15 Carol Deis (Soprano) (c and g)
11.35 Frank Dailey's Orchestra (b and d)
12.00 Amos 'n' Andy (c and g)
a.m.
12.45 Boake Carter (d)
1.30 Texalo Town with Eddie Cantor and Deanna Durbin (e)

THURSDAY

p.m.
2.00 Music in the Air—Variety Programme (a)
2.10 Life in Paris, by Mr. Henri Bellamy (j)
2.30 Richard Maxwell—Tenor Philosopher (a)
2.40 Press Radio News (a)
5.00 Cheri and the Three Notes (a)
6.15 Words and Music (c)
7.00 Rambles in Rhythm (d)
7.30 Dalton Brothers—Vocal Trio (d)
8.00 N.B.C. Light Opera Company; Harold Sanford, Conductor (f)
8.00 Theatre Matinee (b and d)
8.15 Musical Programme (f)
8.30 Do You Remember—Old Favourite Melodies (b and d)
9.00 Howells and Wright—Piano Team (b and d)
9.15 The Guiding Light (c)
9.30 U.S. Army Band (b and d)
11.00 North American Hour—News in English (p)
11.05 Harry Kogan and His Orchestra (f)
11.15 Norsemen Quartet (c and g)
11.20 Latin American Hour—News in Italian, Spanish and Portuguese (i)
11.35 Tony Russell—Tenor (f)
11.45 George Hall and His Orchestra (b and d)
a.m.
12.00 Amos 'n' Andy (c and g)
12 00 Poetic Melodies — Jack Fulton (Tenor), Franklyn MacCormack (Reader), and Carlton Kelsey's Orchestra (d)
12.15 Song Time—with Doris Kerr and Russell Dorr (d)
1.00 Kate Smith's Hour (e)
1.00 Rudy Vallee's Variety Hour (c and g)
2.00 Major Bowes' Amateur Hour (e)

FRIDAY

p.m.
2.00 Metropolitan Parade (a)
2.10 Events of the Moment (j)
2.25 Press Radio News (a)
6.00 Alexander Brothers (c)
6.15 Words and Music (c)
7.00 News Through a Woman's Eyes (d)
7.15 Showtime Matinee (f)
7.30 Montana Slim—Yodelling Cowboy (d)
8.00 Columbia Concert Hall (b and d)
8.30 Three Consoles (b and d)
9.15 Among our Souvenirs (b and d)
9.30 Bon Voyage (b and d)
10.00 "Up the Street" with Sousa's Band (m)
10.15 While the City Sleeps (c and g)
10.30 Salvation Army Staff Band (b and d)
10.30 Pathways to Peace (m)
11.05 Harry Kogan and His Orchestra (f)
11.05 North American Hour—News in English and Italian; Concert of Request Numbers (p)
11.15 Hobart Bosworth—Dean of Hollywood (d)
11.15 Barry McKinley—Songs (c and g)
11.45 Frank Dailey's Orchestra (d and e)
a.m.
12.00 "Poetic Memories"—Jack Fulton (Tenor), Franklyn MacCormack (Reader), and Carlton Kelsey's Orchestra (d)
12.00 Amos 'n' Andy (c and g)
12.15 Song Time (d)
12.30 Jay Freeman and his Orchestra (d)
12.45 Boake Carter—News Commentator (d)
1.00 Lucille Manners—Soprano (c and g)
1.00 "Hammerstein Music Hall"—Ted Hammerstein M.C.; Jerry Mann, Comedian; Guest Star and Music Hall Orchestra (e)
1.30 WGY Farm Forum (c and g)
1.30 Hal Kemp's Dance Band, with Alice Faye and Don Forbes (e)

SATURDAY

p.m.
1.00 Poetic Strings (a)
1.30 Jack Shannon—Tenor (a)
2.00 Breakfast Club (f)
2.00 Ray Block at the Piano (a)
2.10 Judicial Talk by Mr. Henri Delmont (j)
2.15 Dalton Brothers—Male trio (a)
2.30 Richard Maxwell—Songs of Comfor and Cheer (a)
2.45 Mellow Moment (a)
2.55 Press Radio News (a)
3.00 Ruth Cross—Your Garden and Mine (a)
5.00 Continentals (c)
5.15 Orientale (d)
5.30 WGY Farm Programme (c)
5.30 George Hall and His Orchestra (d)
6.00 Happy Jack (c)
6.15 Jimmy Shields—Tenor (d)
6.45 Football Broadcast (m)
7.00 Your Host is Buffalo (c)
7.15 Ann Leaf at the Organ (d)
7.45 Tours in Tone (d)
8.00 "Down by Herman's" (b and d)
8.00 Chick Webb and His Orchestra (f)
8.45 The Dictators (b and d)
9.30 The Dancepaters (b and d)
10.00 Frank Dailey's Orchestra (b and d)
10.00 Press Radio News (f)
10.30 Kaltenmeyer's Kindergarten (c and g)
11.00 North American Hour—News in English (p)
11.00 Ben Feld and His Orchestra (d)
11.20 Latin American Hour (h)
a.m.
12.15 Song Time (d)
1.00 Jack Halley's Variety Programme (c and g)
1.00 Saturday Night Swing Club (e)
1.30 Johnny Presents—Russ Morgan's Orchestra; Charles Martin's Circumstantial Evidence Thrills. "It Might Have Happened to You" (e)

Another Hivac "S.W." Valve

The High Vacuum Valve Co., Ltd., now market their B230 valve with a ceramic base. These class B valves are proving popular for short-wave work and further advantages are in consequence now offered by this departure. As stressed by design in this magazine the twin triode valve has many applications in receiving and transmitting practice and now that Hivacs have given the valve an additional short-wave feature much should be heard of it in the future. When ordering it is necessary to state if the special base is required, the pins are standard, extra cost is 1s.

MILNES H.T. UNITS

The Milnes Unit can be recharged either from a 6-volt l.t. accumulator or from the mains. In the case of a.c. mains, a standard type of unit is suitable, used with one 2-volt l.t. cell for filament supply, both of which can be charged from the mains via an 8-volt charger, which Milnes Radio Co., Ltd., can supply. In the case of d.c. mains, a special type of unit is made for recharging direct from the mains. Almost any voltage of unit can be made, in most cases to give an automatic balancing charge with the mains voltage. It might be noted, also, that Milnes Units can be supplied with grid bias sections of 5, 10, 15 or 20 volts built in, these sections charging along with the h.t. portion.

The Units are made in every size up to 200 volts and in three capacities, "Minor," for h.t. consumption up to 15 ma. average, "Super Capacity" for discharges up to 30 ma. average, and "Double Super Capacity" for discharges up to about 100 ma. average.

CLIX ACORN VALVEHOLDER

We have received from Messrs. Clix a sample of their new acorn valveholder. On wavelengths below five metres, for which acorn valves are especially designed, the insulation losses may be the deciding factor as to whether the receiver works or otherwise, so the design of valveholders at this frequency is of the utmost importance.

The Clix acorn holder consists of a Frequentite ring upon which are mounted the acorn wire supports. The holder, although made of low loss insulating material, is cut away so that insulation losses are at a minimum. One-piece nickel silver contacts are used. Two types are available for either British or American sales, the price being 2s.

International Short-Wave Club Broadcast

On Sunday, November 28, the short-wave programmes of station HAS3 (15.37 mc., 19.52 m. 2.0 p.m. to 3.0 p.m. G.M.T.) and station HAT4 (9.12 mc., 32.88 m. 12.0 p.m. to 1.0 a.m. G.M.T.), Budapest, Hungary, will de dedicated to I.S.W.C. membership, on the occasion of the Club's ninth birthday. The station is anxious to receive reports.

Reflected Waves and Side-splash

in other words—All Sorts of Things

THIS IS an unconventional magazine and instead of sobering with age in each successive issue it becomes still further removed from the ordinary run of technical magazines. Last month, contrary to all journalistic principles, we nearly had an editorial not written by the Editor. This was not another manifestation of our urge for experiment—the natural propensity of enthusiasts such as comprise our staff and contributors—but it happened this way. In telling the Editor that in his leader he was too modest in proclaiming our achievements, he, with characteristic verve told me that if I thought I could do it better I could get on with it —only rather more forcibly than that! As I had asked for it I took up the challenge but unfortunately my leader had to be abandoned as it could not be condensed into the limited space available.

There is in this no suggestion that we are sitting back on our laurels. Like true experimenters we are always striving after something better, and while that enthusiasm continues nothing is impossible. Happily there is no likelihood of that zeal waning; we have all been in the vanguard of radio progress for more years than we care to remember and, maybe you have noticed it with your own pursuit of the hobby, the deeper you go the more eager you become.

● Designers—Please Note

A few days ago the Editor and I took an evening off to do a movie show and we both became greatly intrigued with the heroine's radio, as pretty looking a piece of furniture as anyone could wish to see. She wanted to hear her crooner boy-friend broadcast. He was, of course, an unknown with quite ordinary talent who with a single performance becomes a headline overnight. Nobody in the cinema seemed to think a lot of his singing but the people in the picture went crazy about it. Things like that happen in the pictures (perhaps you have noticed it yourself) but that is by the way—I was mentioning the girl-friend's receiver. A very hot job! When she turned it on the boy-friend's voice came through straight away; no waiting to warm up and no knob-twiddling to tune in. Later she went half-way round the dial for another station without a single squeak or gurgle and brought that one in perfectly without any further adjustment. I have seen a lot about easy control in the advertisements for b.c.l. sets lately, but nothing to come up to that.

● On recommending sets you know nothing about

That reminds me that receiver manufacturers nowadays never tell the public anything about the insides of their sets. The average advertisement for them appears to be written especially for maiden aunts and the fact that they have insides at all does not seem to be quite the right thing to mention. But seriously, the simpler things such as the number of valves is no longer mentioned, not that the number would be any guide now multi-electrode valves are invariably used. Even in the folders describing the sets you find that all technical talk is studiously avoided. Which is all very disconcerting because nowadays most of us buy the family broadcast receiver, and after all when your friends contemplate buying a set they usually come to you and ask your "expert" advice on what to buy. I am often asked for such advice and being afraid to admit to knowing next to nothing about broadcast receivers I usually have to look wise and ask them if they have any particular models in mind. When they say "Well, I was thinking about a —— all-waver" I reply, "Ah! a very fine set, you won't go far wrong there, but you ought to hear a —— Broadblaster (the first name that comes to mind) first."

I used to feel very pleased with my diplomacy but after all it is not quite honest. I suppose you do something similar when you are consulted on such a question, and the manufacturer who goes to the trouble of doing a spot of technical advertising would stand an excellent chance of capturing sales by "honourable mention" in these consultations. After all, the city magnate would rather take the advice of his office-boy, known to make his own receivers and to read technical journals, than that of a radio dealer who is always suspected of pushing the most profitable lines.

● Fone—on 'Phones

Many newcomers are making their debut to short-wave listening by the acquisition of an all-wave set. Listening around on the s.w. bands they find, half by accident, that they log a few good catches. At first they are interested, and then fascinated when they discover a new world—amateur radio—where a strange language is spoken and most extraordinary things are done and—well, then the bug bites them. After looking round, blinking and wondering how long this has been going on they suddenly become conscious that their ideas want quite a lot of adjustment.

One idea which seems particularly prevalent is that headphones died with the crystal set. Then it suddenly occurs to them that perhaps alter all headphones can be an advantage when listening to weak signals or for concentrating. When s.w. listening really gets under their skin, they irritate the rest of the household with the noises they make in the

loudspeaker by their knob-twiddling and realise that can be avoided by using 'phones which will also permit them ether-searching after the family have retired for the night. Thereupon, off to the box-room to dig out that old rusty pair of 'phones, which, if they have not already been condemned as an anachronism, are pressed into service. While these can be used, they compare very unfavourably with their modern relations.

In the early days of broadcasting primitive crystal sets sold for 5 or 6 guineas and even more, and as for 'phones lots of pairs of poor quality were sold at proportionately high prices. The best of that period, although unaltered in principle (or in their outward appearance for that matter) have been greatly improved upon and the 'phones of as recent as three or four years ago are found to me as much as 20% less efficient as those made to-day. To these listeners a reminder that the performance of any receiver is limited to the sensitivity of the final link may not be out of place.

● Unofficial Test

Recently we have had some Brown's telephones at our laboratory for test and I must admit to a weakness for their "A" type. My first pair of 'phones in 1919 were of that type and since then I have watched each improvement with interest, so I was simply unable to resist the temptation to sneak out with them under my coat one foggy night. This type embodies the reed movement invented by Mr. S. G. Brown, F.R.S., in connection with the telephone relay in 1908 and was applied by him to headphones in 1910.

Briefly, the principle is that the reed, which is adjustable to the poles by a knurled knob, is held in sensitive suspension between the pull of a powerful magnet in the one direction and its own elasticity in the other. This is attached to a conical aluminium diaphragm, very similarly to the cone of a balanced armature speaker.

Incidentally, before cone speakers were introduced amateurs made a stride in their loudspeaker reproduction—up to then we had only known what we politely called horn speakers which were ordinary earpieces with trumpets of various shapes—when some ingenious amateur thought of using Brown's reed movement to drive a large cone! Before long everyone was hunting for these ear-pieces. We made the cone by pleating cartridge paper and suspending it in ten- or twelve-inch milliners' hoops with a blob of sealing wax dropped in the centre; the "drive" being taken by a piece of rigid wire soldered to the reed and set in the sealing wax. Compared with its contemporaries the quality of reproduction was an amazing advance, and the fact that the earpieces stood up to it without the slightest sign of distress, often with a comparatively heavy d.c. current through the windings, speaks volumes for the workmanship put in their manufacture. My first pair, and another I bought later were, to my subsequent regret, converted to loudspeakers, delighted as I was at the time.

Without going into facts and figures (anyway this is not a technical column) I will content myself with saying that the latest pattern are worthy of the name they bear and are to be thoroughly recommended from every point of view, sensitivity, lightness, comfort, etc. No doubt you know they are extensively used by Governments, etc.—it is generally accepted that cost is no object to them—but if you think 50s. a lot of money to pay for a pair of 'phones all I can suggest is that you ask any amateur who uses them whether they are worth it. Browns do make ordinary 'phones, the Featherweight and type "D" for instance, both excellent examples of the flat diaphraghm type, but they have not the same interest for me.

● Any more suggestions?

QSL card design is a matter of great importance especially when one first receives one's full licence, and many hams have given it almost as much though as the design of the tx itself in an attempt to contrive something strikingly original, but they usually finish by sending for specimens and selecting something costing a lot less than the one they first dreamed about. I remember hearing about a

wag at a certain radio club when they were first granted a full licence suggesting a design for their QSL in the form of a shield emblazoned with two bright emitter valves rampant on a grid bias battery sinister flanked by a grid leak recumbent, or something of that sort. Now 2NS forwards the card illustrated. He thinks it a refreshing pattern for shack wall-paper!

It doesn't refresh me—on the contrary, it gave me a thirst.

Centre Zap.

THE "S.-W.M."

IDEAL RECEIVER

Final Details and Operating Notes

Engineered by AUSTIN FORSYTH (G6FO), "S.-W.M." Technician, in collaboration with BASIL WARDMAN (G5GQ), Editor.

III.

THIS MONTH we deal with the final points regarding the construction, adjustment and operation of the "Ideal Receiver." Herewith is the complete coil table, together with some notes which should be carefully studied. The table is set out so as to show the coil data band by band and stage by stage, and when making up the coils, it is absolutely essential to keep exactly to this data, since such matters as the regeneration control in r.f. and detector stages, as well as the coverage, have been carefully worked out to give both smooth performance and a continuous tuning range of approximately 9 to 200 metres, allowing a certain amount of overlap on each set of coils.

● Band Spread

With reference to the amateur bands, the taps shown in the 10th column have been arranged in such a way that each is spread fully over the main tuning dial, with enough commercial coverage at the h.f. and l.f. ends to bring in the marker stations. On 7 mc. for instance, the 7,000-7,300 kc. band falls between 10 and 90 degrees on the Eddystone Full Vision dial, when the band-setter is reading 63 degrees. Similarly with all the other bands, the 13th column in the table showing the dial adjustments for each one. Note, however, that these figures cannot be taken as being exact to a degree, as on the h.f. bands in particular, different models of the receiver will involve settings a degree or two either way of those given. They will in all cases be near enough to find the band at the first attempt, the final touch being to get the l.f. end with the main dial reading 10 degrees, or the h.f. end with C2-C8 at 90 degrees. The band-setter values so found should then be logged for quick changing over.

● Full 3.5 mc. Coverage

One further point regarding band-spread is that for 3.5 mc. (80 metres) it has been designed to cover the whole of that band instead of the restricted range allowed for operation by British stations. The international 80-metre band is from 3,500 to 4,000 kc. amateur stations in this country only being permitted to use 3,505 to 3,730 kc. Giving full coverage of this latter range would have involved a second setting of C1-C9 to bring in the American amateur 'phones, who operate right down to 4,000 kc.

As mentioned in the notes, the taps are all counted from the earth end of the various coils, and in the case of those for band-spreading, the two sections of L2 and L4 must be made exactly the same for any given band, i.e., on 7 mc. the band-spread sections must both be 3§ turns and the same amount of wire used in each case, or condensers C2-C8 on the main tuning control will not track up accurately. The odd-turn values can be calculated by counting round the ribs, as is done for the r.f. regeneration taps. Where there are windings on one coil former which for the grid side have to follow the threads and for aerial or reaction sections are close-wound, the ribs where the latter come will have to be flattened a little by filing, to take out the threads. This should not be overdone, as only a few strokes with a sharp file are necessary.

When terminating the windings at the pins on the formers, enough wire should be left protruding to enable the blob of solder to get a good grip. Clean the work well, and use a hot iron, carefully testing each joint to make sure it is quite secure. We encountered all sorts of trouble with one of the r.f. stage coils, the windings of which appeared to be properly soldered to the pins, though in fact a high-resistance connection existed!

The different coils should be marked in the insert labels provided with each one, the disc being fixed in position with a smear of "Durofix" round the edge. An error occurred on page 25 last month: Centre coil, lower winding, should read "L3 V1," not "L3 V3."

● Adjusting the Trimmer

With a given set of coils plugged in—7 mc. let us say—tune the receiver to the middle of that band, which will be at 50 degrees on the main tuning dial and about 63 on the band-setter. Then, find a signal and, with the detector just oscillating, put an insulated screw-driver in the slot of the trimmer condenser, varying it while turning the r.f. regeneration control knob gradually from zero towards maximum setting, i.e., in a clockwise direction, or towards you. The r.f. gain control potentiometer should be set roughly half-way round meanwhile, giving the valve about —1½ volts bias. As the trimmer is varied, and the screen voltage advanced, a point will be found on the former where the r.f. valve goes in and out of oscillation as the trimmer condenser is moved through it. In other words,

the r.f. stage "peaks" or comes accurately into tune with the detector, and when this position is found, the regeneration control and reaction setting on the detector should be reduced till the oscillation peak is only just apparent, as shown by small positive and negative movements of the trimmer. The exact point at which the peak occurs is the setting at which the trimmer should be left for that particular pair of coils, which will then be correctly lined up.

This operation, which sounds very complicated, but isn't—though do not expect to get is right the first or even the second time if you have never adjusted a trimmer condenser before—has to be carried out for each band, but a little practice will enable it to be done in a moment and the peak settings will all be found to occur with the trimmer nearly at minimum capacity.

● R.F. Regeneration Control

The process of adjusting the trimmer will set the value for this quite closely, but it will be found that there is a secondary effect—the relation between r.f. regeneration and detector reaction. Needless to say, r.f. regeneration should always be used such that the h.f. valve is just not oscillating, but if the detector screen grid voltage is too low—involving the reaction condenser having to be nearly all in—r.f. regeneration will be snappy and reaction on the detector side very fierce. Actually, the screen-grid voltage on the detector should be such as to give smooth reaction, and this will be when the *condenser* is nearly all out, the r.f. valve going in and out of oscillation almost imperceptibly under these conditions. On all bands, smoothest reaction control will be found to occur with the condenser varying between 10 and 30 degrees dial reading, and it will hold its setting over fairly wide frequency ranges—100 kc. or more on 7 mc.

Coming back now to the signal originally tuned in before the trimmer and r.f. regeneration adjustments were made, it will be found that this is very much stronger, being at its maximum with the r.f. valve just not oscillating, as previously explained. If the signal on tune is c.w. it will be heterodyned in the r.f. stage with the detector out of oscillation, though this not only involves a certain amount of re-radiation off the aerial, but the strength will not be nearly so good as when the r.f. stage is properly adjusted and reaction used on the detector side. As regards telephony signals, they cannot of course be resolved if either r.f. or detector stages are oscillating. There is, therefore, no point in making the r.f. stage oscillate, since the receiver is not then in its most sensitive condition.

With regard to the r.f. gain control, R1 in the circuit diagram, this also has a slight effect on r.f. regeneration, in that altering the bias, which of course varies the plate and screen current as well, causes a change in plate and screen voltage. Though this is very slight, it is enough to provide a vernier control of r.f. regeneration. Normally, this resistor R1 should be left set at the mid-way position.

Other effects which will be noticed when first handling the receiver are that if the r.f. and detector stages are not properly lined up, i.e., trimmer out of adjustment, any signals which are separated by the frequency difference between r.f. and detector stages will be tuned in twice on the band-spread dial if the r.f. stage is oscillating; also, on the l.f. bands, 1.7 and 3.5 mc. the r.f. regeneration setting will not hold over the whole band. The reason for this—the effect is common to all receivers fitted with r.f. regeneration—is that the wider coverage involved on these bands means that a satisfactory setting at the h.f. end, say, is not enough for the l.f. end. A satisfactory compromise is attained by setting the control such that r.f. regeneration is right for the middle of the band, and then adjusting it if it is necessary to sharpen up or tone down a signal at either end.

The performance on the h.f. bands, 14 mc. in particular, is very lively and considerably better than any t.r.f. receiver without r.f. regeneration. The same applies to 7 mc., the point of these remarks being that if one changes over from 7 or 14 mc. to 1.7 mc. the receiver appears dead by comparison. The reason for this is that r.f. regeneration does not have such a marked effect on the l.f. bands, because there are no circuit losses of any consequence to be made up on 1.7 mc. This was explained in the first article on the receiver in the September issue. However, a side-by-side test with any other t.r.f. receiver will show that it is quite as good, and probably better.

● Operating the Beat Oscillator

There is not much more to be said about this, as it is quite straightforward and has been fully explained. The coil values bring the beat-note to the middle of the tuning dial on all bands, though there is more "sweep" on 1.7 mc. than on 28 mc. naturally. For ordinary reception and monitoring purposes, it will be found better to use only one b.o. coil at L6, that for 3.5 mc. This will give good beat-notes throughout the amateur bands, and the settings of one's own transmitter or stations worked on schedule can be logged on the monitor dial. Separate heterodyne reception will be found very helpful when working c.w. under bad QRM conditions, but for *'phone monitoring* it is necessary to use at L6 the coil which covers the band being used for telephony transmission. Monitoring 'phone on a harmonic is not at all satisfactory.

All the preliminary adjustments and testing described above should be carried out with headphones, as thus one is brought much nearer to the receiver. For headphone work, a pair of high-resistance Browns cannot be bettered—note that the circuit is arranged for h.r. 'phones and matched speaker operation, the primary of the Epoch multi-ratio output transformer acting as the coupling choke for the headphones. If low-resistance 'phones are used, they should be matched in with the coupling transformer, and *not* simply plugged into the 'phone jack, which is for a h.r. pair only. It is of course a simple matter to wire this jack to the output transformer in such a way that a low-resistance headset can be used.

● Matching the Speaker

While the Epoch output transformer mentioned allows any speaker to be matched to the output valve, it is advisable to use the Epoch New Century Speaker for the best results, as this is particularly sensitive and makes the most of the weaker signals, while it is also easily matched with the transformer. Note that the output transformer is arranged for impedance-variation on the primary side—that is, the speaker or l.r. 'phones are connected to the single pair of terminals, the matching being carried out by altering the taps on the row on the other side. The easiest way to do this is to tune in a steady signal and then, by varying the position of one lead, finding the terminal which gives the loudest reception. With the average speaker, it will usually be noticed that two points give almost equal signal strength, and it requires a little care to choose between them. It is best to do the matching with a fairly weak signal on tune, as then differences in loudness are more easily discerned.

Variation of the taps is possible over a very wide range, since both leads can be altered in relation to one another, giving a very accurate match to either headphones or speaker.

For those who may be without l.t. or h.t. supply, or may have to consider new batteries, the Exide or may have to consider new batteries, the latest Milnes Unit is a proposition very much worth while, particularly for locations where there are no mains or charging facilities are unsatisfactory. There is not the least doubt that for absolutely dead silent background, battery working is preferable for short-wave reception. As dry h.t. batteries are a continual source of expense, accumulator high-tension supply is the best way out of the difficulty. Even where mains power is possible, battery operation is better for amateur-band work with headphones.

● The Aerial

As regards the best aerial to use with the receiver, our own preference is always for a plain inverted L. This picks up all that is going—including the noise, some will say!—on any band, and while a doublet can be used, it immediately ties one down to a single narrow range of frequencies for best reception. A doublet does not work as such on its *even* harmonics and is therefore useless for amateur-band working throughout the range. In other words, a 40-metre doublet is right only for that amateur band, its other response wavebands being 13.3, 8.0 and 5.7 metres, not 20, 10 and 5 metres, as might be supposed. Operating a doublet off its fundamental or odd-harmonic frequencies results only in rather poor inverted L reception. Furthermore, it is doubtful whether many of the doublets in use are really effective even on the bands for which they are cut, as the termination is not always the simple matter it appears to be. Noise-reduction can be effected with a properly-designed, erected and terminated doublet, but this is about the only value it has over an inverted L aerial.

From time to time, we shall publish further notes on the "Ideal" range of receivers, both as regards short-wave broadcast and amateur-band reception. Next month, we shall give a log of the s.w. broadcast stations normally receivable, with their dial settings. In the meantime, readers will be able to explore for themselves and see what they can do.

COMPLETE COIL DATA

Band.	Stage.	L1.	L2.	L3.	L4.	L5.	L6.	Reg. tap.	B-s tap.	Wind.	Space.	C1-C9 Dial
1.7	RF	15	43	—	—	—	—	6 ribs.	26	Close	$\frac{1}{8}''$	50
Mc.	Det.	—	—	15	53	10	—	—	26	Close	$\frac{5}{16}''$	
	BO	—	—	—	—	—	50	7	—	Close		
3.5	RF	12	20	—	—	—	—	6 ribs.	14	Close	$\frac{1}{8}''$	30
Mc.	Det.	—	—	12	24	8	—	—	14	Close	$\frac{1}{16}''$	
	BO	—	—	—	—	—	33	4	—	Threads		
7 Mc.	RF	5	10	—	—	—	—	6 ribs.	$3\frac{1}{8}$	L1, L3, L5		63
	Det.	—	—	8	12	4	—	—	$3\frac{1}{8}$	Close. L2	$\frac{5}{8}''$	
	BO	—	—	—	—	—	16	3	—	L4, L6 threads	$\frac{5}{16}''$	
14 Mc.	RF	4	6	—	—	—	—	6 ribs.	1		$\frac{5}{8}''$	32
	Det.	—	—	5	7	4	—	—	1	As above	$\frac{5}{16}''$	
	BO	—	—	—	—	—	7	2	1			
28 Mc.	RF	3	$2\frac{1}{2}$	—	—	—	—	4 ribs.	$\frac{1}{2}$	Follow	$\frac{3}{4}''$	23
	Det.	—	—	4	$3\frac{1}{2}$	3	—	—	$\frac{1}{2}$	threads all	$\frac{1}{2}''$	
	BO	—	—	—	—	—	3	1	—	windings.		

NOTES.—In 9th column, "ribs" are the ribs of coil former, as less than one turn is required for r.f. regeneration. On 7 and 14 mc. L1, L3, L5 are all close wound, but L2, L4, L6 follow threads, and the figures for regeneration tap of L6 indicate turns. All taps are counted from the earth end of the coil, and it is essential to make the band-spread taps (10th column) equally for each band. The 12th column gives spacing between windings top line between L1 and L2, bottom line between L3, L4 and L5. 13th column gives approximate setting of band-spread condenser dial for amateur ranges.

The Short-Wave Listener

The writer, Bob Everard, is the keenest short-wave listener we know

SHORT-WAVE LISTENERS comprise three classes: No. 1, the beginner, to whom even quite local reception on short waves is marvellous (and which it really is, o.m.); 2, the slightly more advanced type who prefer stations further afield; 3, the advanced grade addicted (or otherwise) to dx station logging and to the pursuit of QSL's and verifications, and proving to some purpose their dx reception capabilities. To this class mere local or European reception possesses no real interest beyond notification in their log books, but any weak dx sounding signals are pounced on with avidity.

● Broadcast or Amateur?

I have been told that logging the "ham" phones is much easier than logging, say, South American broadcasters. Perhaps so with phones such as W1, 2, 3, but try logging W5, 6, 7, and some W9's, also VE4, 5, K6, VK's, etc., many with quite low power, different frequencies, erratic operation, and last but not least, 14 mc. QRM, as against less QRM and longer operation of the broadcasters.

I always endeavour, where possible, to send a report covering at least 30 minutes to 1½ hours or so when reporting to a broadcast station, and, if possible, more than one call when reporting to a "ham" phone. Some dx'ers affect to despise QSL "veri's" sent for merely reporting reception of a phone "calling CQ," but to my mind hearing a station calling CQ is one of the surest ways to identify the said station.

Now as to logging phones, accuracy is of course very important. Accuracy not only in logging the call correctly, often in face of severe QRM, from other stations, but getting time of reception correct. I myself use an electric clock.

When logging "hams," always endeavour to log the full call. When I first started I used to jot down the calls a letter at a time, but now, almost automatically I record A as Albert, B as Boston, etc., in a 1s. type exercise book of about 150 pages, and about 8 x 8, as I find larger log books a little unwieldy. Unusual "skip" conditions, etc., are noted.

Discretion must be used when reporting to "hams"; reports do not mean anything to many W1-5 stations, and even W6's in some cases, do not welcome reports. Good detailed reports to stations who seem unable at the time to raise a QSO, or to stations in out of the way parts of the world are always welcome.

● A QSL Query

A point has been raised as to when is a QSL card a "veri." Some state that QSL must state reception verified, but I contend that the reception of a QSL constitutes an acknowledgment of your receiving the station. If your report had not tallied with the station log a QSL would not have been sent, only (in my own experience) reception of a letter informing me that my report was incorrect or no answer at all!

The QSL's I prize most are those from stations that I was the first in Europe, or Great Britain, to report. I possess well over 140 of this type of QSL, several of which even state that my report was the first received outside of their own country. We dx'ers welcome these little missives, I say "little," but possess a few QSL's measuring up to 8-10 inches square.

● Receivers

Finally, a word on short-wave receiving equipment. Mainly, on account of financial reasons, I did most of my dx'ing on a short-wave converter; but I now use an all-mains superhet six-valver, but still believe that a really good converter (plus a really good superhet b.c. receiver), the convertor possessing reaction control, to be able to pull in the dx and weak signals requiring a peak of reaction just as well or even better than an all-waver. But my ideal short-wave receiver is one with at least one stage of h.f. preceding the detector, two i.f. stages with crystal gate, if possible, bandspread, and a proper phone jack, the whole enclosed in a metal case. Tuning and other knobs which are often handled placed conveniently low down; an R meter would also be necessary. The only receivers possessing these specifications are those made in U.S.A. and which are simply too expensive for most of us. I have often wondered why our British manufacturers do not place such a receiver on the market at about £25 complete. A considerable number of these would be purchased by serious short-wave listeners or "hams," who would much prefer to buy receivers of this type using British parts which could be replaced much easier than those in U.S.A. receivers. Also it seems strange, to say the least, that a number of Government and civic enterprises have had to purchase American receivers.

Well! to you who have waded thus far I will only say, very best dx and 73, o.m.

A 56 mc. TRANSMITTER

For Portable and General Use

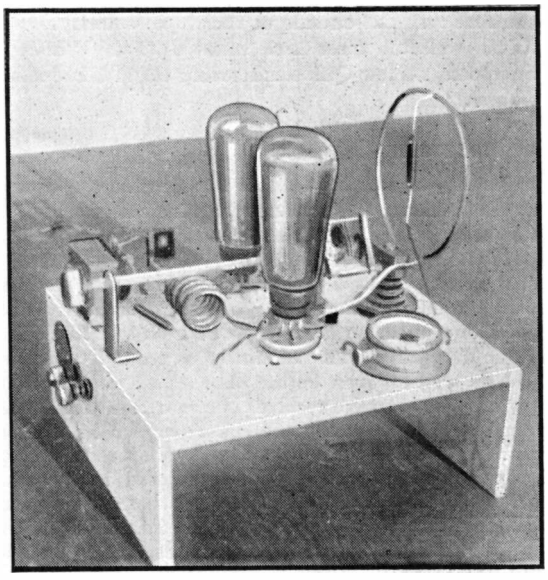
By ARTHUR C. GEE (G2UK)

THE 56 mc. amateur band has been previously more or less neglected but it is at last receiving the attention it deserves, especially by those amateurs of an experimental turn of mind. One of the chief difficulties in conducting experiments on this frequency is the absence of active stations on the air and the consequent inability to get co-operation.

It is felt that if more amateurs would put out signals on this band its development would be greatly accelerated.

● Simple Modulation

Some excellent ultra-high frequency transmitters have been described already, but the writer feels



that the five-metre transmitter described here may be of interest to readers because of its simplicity, its ease of construction and the fact that a method of modulation is used which requires no speech amplifier at all, thus resulting in a design ideal for portable work.

The transmitter can be made in a short while and most of the components will be already available in the shack. It can be used either for 'phone or m.c.w., the results with the latter being very good indeed.

As can be seen from the circuit diagram it consists of a resonant grid type of oscillator using two valves in push-pull. The whole rig is built on a chassis of $\frac{1}{4}$-inch plywood twelve inches by fourteen with two end pieces twelve by three. All leads and the filament by-pass condensers are mounted on the under side of the baseboard.

● Circuit and Design

The general layout of the components can be seen from the photo. The two valve holders are placed in the centre of the baseboard. The anode coil consists of a single loop of $\frac{3}{8}$-inch copper tube bent into a circle five and a half inches in diameter. The ends of the loop are left long and are used as the connecting links between the anode terminals on the valve holders and the loop. The anode "coil" is supported as shown by a stand-off insulator and two pieces of ebonite arranged to clamp it tightly. This method of constructing the anode coil enables the aerial feeders to be tapped on to the exact point for proper aerial coupling and also keeps losses low.

The anode coil is tuned by a .00005 mfd. variable condenser. This should be soldered directly across the ends of the loop as shown in the photo. An extension handle consisting of a twelve-inch length of $\frac{1}{4}$-inch wooden dowel rod passes between the valves and connects the spindle of the tuning condenser with the tuning dial supported by a bracket on the left hand side of the transmitter.

The h.f. choke in the h.t. lead is by Eddystone (type 1011) and is soldered to the centre of the anode loop.* A lead is taken from it to the milliameter seen mounted on the front of the transmitter. The other lead from the milliameter goes under the baseboard to the h.t. terminal. For an input of ten watts a meter reading up to 50 milliamps is suitable.

No h.t. by-pass condenser is used as the transmitter was found to work satisfactorily without it; one of the objects in this design being to use as little gear as possible.

The grid coil is also of $\frac{3}{8}$-inch copper tube; six turns of one-inch diameter, turns spaced about $\frac{1}{8}$-inch. The tube can be wound round the handle of a broom. No tuning condenser is used for the grid coil as the turns of the coil are pushed nearer or farther apart as required to bring the transmitter into tune. The coil is self supporting, being

*Since writing this article it has been found that h.f. chokes of the "section-wound" type give better results.

connected directly to the grid terminals on the valve holders.

Another Eddystone u.s.w. choke is soldered to the middle of the grid coil and a lead taken from it to one of the secondary terminals of the microphone transformer, which is placed on the left of the baseboard toward the back. The other terminal of the secondary goes to the g.b. terminal mounted on a small ebonite bracket at the back of the baseboard.

All earth leads are taken to the earth terminal on the right side of the chassis.

Grid modulation is used and has given excellent results, enough output being obtained from a carbon type of microphone to fully modulate the transmitter without any further speech amplification. An old G.P.O. type microphone has been used by the writer with great success. A six-volt grid bias battery provides sufficient voltage for it although a six-volt accumulator would be more satisfactory. The microphone transformer is a high ratio one, 1:75 or 1:100 being quite suitable. Reports of "full modulation" have been quite frequent and several stations have expressed surprise when told of the simple modulation system used.

When using m.c.w. a valve oscillator is used in place of the microphone.

● Valves

If the transmitter is to be used for low power portable work 2-volt battery valves of the LP2 type will be most suitable. For higher outputs 4- or 6-volt valves can be used. For ten watts a pair of DE5's is suitable, whilst for outputs up to 25 watts use two LS5's or P650's.

A.C. can be used for lighting the filaments if the secondary of the filament transformer is centre tapped and earthed or a 50-ohm resistance can be shunted across the filament leads and its centre tapped and earthed.

The power supply to the transmitter is connected via a four-pin plug and socket. The latter can be seen on the left hand side of the chassis. The two terminals for the microphone are next to this socket. These two terminals are wired up with the primary of the microphone transformer.

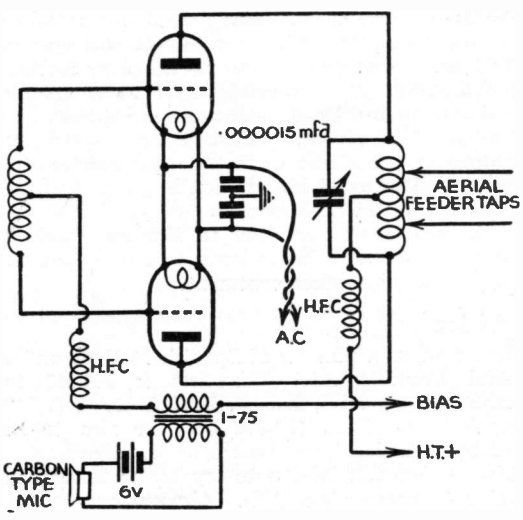
● Aerial

A half-wave dipole with flex feeders is the easiest to get going. The dipole can be of copper tubing supported on stand-off insulators screwed to a length of two by two timber about twelve feet long and erected vertically, or a horizontal aerial of 14 s.w.g. copper wire can be used. Cut the aerial so that its overall length is 8 feet 1 inch.

Good quality flex is quite suitable for the feeders, if the sort with an outer covering of rubber can be obtained so much the better. Any length of feeder up to 50 feet can be used and it should be soldered to the aerial. The other end of the feeder is connected to two flash lamp bulb holders soldered to a couple of crocodile clips. When tuning up, things are adjusted until two 2-volt flash lamp bulbs inserted into the sockets glow at maximum intensity.

● Tuning Up

Clip the crocodile clips on to the anode loop about two inches either side of the centre point, i.e., the point where the h.f. choke joins the anode coil. Switch on the filament current and apply bias. With P650's about 80 volts is sufficient. Apply suitable h.t. voltage. Again with P650's use about 300 volts when a current of about 50 milliamps will be drawn. Tune the tuning condenser until the transmitter is oscillating in the five-metre band. This is easily done by listening on the receiver as the transmitter is tuned up.



Try slightly adjusting the position of the aerial taps and the tuning condenser until maximum brilliancy of the flash lamps is obtained. When finally adjusted these bulbs can be shorted out. Connect up the microphone with its 6-volt battery. On speaking into the microphone the h.t. current increases with the intensity of the voice, showing that the transmitter is working properly.

● Results

This transmitter has been in use during a series of tests carried out by the members of the Southend-on-Sea Radio Society. Some excellent results have been obtained with this transmitter operating under the society's call sign—G5QK-P.

R8 reports have been received on phone and m.c.w. signals from stations up to 6 miles away, over country which was far from flat.

The absence of cumbersome speech amplifying gear and its associated power supply makes the transmitter an ideal one for portable use.

FOR THE INTENDING DX'er

Our Contributor makes a few suggestions for readers desiring dx attainment

By DONALD McKENZIE

As this short article concerns long-distance listening we shall not consider the reception of European stations, those transmitters enumerated comprise dx achievement. I do not intend to discuss the question of verification by detailed advice as this information is being given each month on other pages in a very satisfactory manner.

● Iceland

For the purpose of our "tour" we shall commence with Reykjavik, Iceland. The call of this station is TFJ and broadcasts are to be heard in English every Sunday on a wavelength of 24.52 metres between 18.40 and 19.30. All times are G.M.T.

The QSL card given in exchange for a report has a picture of the Radio Choir, the transmitter and buildings. The usual information is given, and the power is stated as 7.5 kilowatts.

Reykjavik is well received in England, and as reluctant as we may be to leave this cool spot we must pass on to another continent.

● Africa

Here we find a number of Spanish stations under General Franco's rule. The first is EAJ43 in Tenerife, Canary Isles, 28.9 m. EAJ, EA8AK (7,140 kilocycles) and EHZ (10,370 kc.) are also to be heard broadcasting from these Spanish islands.

Another Spanish station to try for is Tetuan in Spanish Morocco (EA9AH). Almost every day between 19.00 and 01.00 you may hear the slogan "The Voice of the Trenches" on 14.03 megacycles. Forty metres are used to work amateurs around 03.00 daily.

Our next point is East Africa and the station VQ7LO situate in Kenya, is a good catch; listen on 6.08 mc.

Before leaving Africa let us try for that interesting call IUC (Addis Ababa). Operating on 11,950 ko. IUC can be heard daily between 04.00 and 06.00 as well as most afternoons.

● Australia, Fiji and Japan

Have you tried for VK8SC? This station represents really good dx, it is low-powered (200 watts) and operates on 6.96 mc. at 08.30 for three-quarters of an hour every Sunday. The station is owned by Australian Medical Services to broadcast information to a flying doctor. VK8SK is situate at Port Hedland, W.A.

VPD2 in the Fiji Islands broadcasts weekdays between 10.30 and 12.00 on 31.45 m. I have heard JZK (Tokio) at R7 every night since July 1.

● South America

Numerous stations are active in South America, but in my view the best dx is HJ1ABJ in Santa Marta, HCJB (Quito, Ecuador), CP6 (La Paz, Bolivia) and CB960 (Santiago, Chile).

Another source of dx is the amateurs on 20 metres. Listen for SU1KG, SU1SG, SU1CH, CT1AY and W's any night, they come in at good strength.

● Ships

Also, have you picked up any ships yet? This is another source of dx. Here are a few of them: VQJM, *Monarch of Bermuda*; GMBJ, *Empress of Britain*; ICEJ, *Rex*; GBZW, *Berengaria*; JFZC, *Chichibu Maru*. They operate on 4 bands: 16.85-18.27 metres; 22.50-24.3 m.; 33.93-36.58 m.; 66.87-73.17 m.

These ship stations are telephone stations, and sometimes are rented to broadcast a ship's concert. ZMBJ, on the ship *Awatea*, is on 8.84 mc, broadcasting when at sea. They usually 'phone Australia and New Zealand between 05.00; power is 400 watts, and L. H. Jones, the operator, verifies. Slogan is "Ears and Voice of Tasmania." Not many have heard ZMBJ yet, and so the QSL will be worth trying for.

According to official information received by the writer from Moscow, there will be no QSL's issued from RAEM, North Pole, this is owing to the fact that they are too busy with scientific research, and that regular communication is only possible through the radio at Rudolph Island.

RADIO-NATIONS' EXTENDED SCHEDULE

The Information Section of the League of Nations Secretariat announces that the nightly broadcast given from Radio-Nations during the session of the League Assembly have aroused such a favourable response among listeners that the same times and wavelengths are to be adopted for the weekly transmissions from Radio-Nations throughout the winter of 1937.

The new schedule involves some extension of broadcasting time, and is expected to provide a convenient listening-time in many different countries.

The weekly broadcasts in English will be given each Friday night, according to the accompanying schedule.

HBO (26.31 m.) at 19.00 to 19.15 G.M.T., for the British Isles and South Africa.

HBL (32-10 m.) at 24.30 to 24.45 G.M.T., for Canada and United States.

CORRESPONDENCE

BEWARE!

I expect you welcome a little criticism as well as praise, and there is one point in an article which struck me as being rather undesirable. In the article, "Power Supply," by A. J. Devon, the writer tells how it is possible to obtain 460 volts from a 3-wire d.c. system. He does not mention, however, that anyone doing this is liable to prosecution by the electricity company on at least four counts, not to mention the damage an incompetent person might do to the local distribution box. This practice may be done by some amateurs, but I do not think it desirable to publish details in an amateur magazine.—A. W. HARTLEY (2BTZ), 35, Essex Road, Finchley, N.3.

A. J. DEVON EXPLAINS

[With regard to my article, "The Power Supply," in your issue of August, and the criticism of your correspondent with reference to the use of the two "outers" of a 3-wire 230v. d.c. supply system to get 460 volts for transmitter operation, may I say that while it is naturally essential to obtain the permission of the electricity concern before actually using such a supply, no danger or dislocation of the mains can be caused provided normal, reasonable precautions are taken by the average intelligent person. In other words, nobody in his senses (and no honest man) would attempt to by-pass the electricity supply to his house in order to get it free of charge, nor would he then go and put a copper rod across the mains on the company's side of his fuses, thereby doing all the damage and laying himself open to all the charges your correspondent evidently has in mind.

Perhaps it should have been explained in the article that the proper procedure would be first to find out if the three lines are in fact brought into the house, this being done either by a lamp test if the person concerned is competent or preferably by enquiry at the local electricity company's office, and then ask for a meter and switches to be put in so that the 460 volts can be used. The estimated load will have to be stated, and this is where explanations will be needed, as normally the 460-volt supply is only connected for operating motors, etc., above a certain horse-power. When the prospective user discloses that his load will be rather less than that imposed by an average house-lamp, an arrangement will have to be arrived at with the company to make it worth their while.

I should also perhaps mention that the above remarks are based on personal experience with two different electricity suppliers, and that I am acquainted with three amateur transmitters who operate under the conditions suggested.]

A "RIP VAN WINKLE"

I was much interested in your editorial in the September number of your magazine, the first that I have read. You suggest a classification of wireless enthusiasts analogous to the "R" and "QSA" systems, to include everything from the extreme novice to the graduate with a transmitter and cupboards full of records of distant reception. I think you would require a new classification for such as myself, who might be described as a Rip van Winkle.

I gave up making my own sets in the days when screen-grid valves and band-pass coils first came, regarding them as too expensive and complicated. I got a good commercial set, which served me for five years. Now I have an all-wave set, and have succumbed to the magic of such of the short-waves as it will pick up. But there is no pleasure in trying to get distant stations with a set whose insides you do not understand. So I cheerfully decided to find out about those insides, and if possible do a little hotting up in the short-wave section. That was where I awoke to the present situation of wireless.

Five years ago you could get books on every railway bookstall that would give you the dope on all the commercial sets on the market. Every wireless shop stocked everything you wanted in the way of components and odds and ends. To-day I went to five shops without being able to get a piece of ebonite, a couple of terminals, and a variable condenser. At last I came to a shop that was full of antiques —plug-in coils, crystal sets in coconut shells, and what-not. But not a single shop could I find that stocked anything in the way of modern components or instructions as to their use.

It would seem that the wireless experimenter is an extinct bird, I thought I am just a fossil come to life. Your magazine dispelled that thought, but the fact remains—perhaps it has escaped the notice of those to whom the change has been a gradual one—that experimental wireless is a much more exclusive business than it used to be. Presumably it is because the modern medium-wave set has made it so easy to get a crop of foreign stations, that it is only when you tune to the short waves that the old thrill is recaptured, when the set is flat out, the headphones stuffed to the ears, as one listens to one dead-and-buried dance number after another in the hope of an identification.—R. S. HUNT, 90, Shrewsbury Lane, Woolwich, S.E.18.

£1 LOW-POWER TRANSMITTER

80% of the amateurs simply adore getting a f.b. bargain and making it go in the rig. You being an amateur I guess you will know what I mean. Now, for instance, I made a bet with G6SG that I could make up a decent little 7 mc. tx. (exclusive of crystal) for under £1, using two American valves in tx. and one in h.t. unit, costing 9s. for the three; scrounged round and got my mains unit, 300 v. with l.t.'s home wound, for 5s. and the rest was easy. Chassis for both—discarded b.c.l.—at 2d. each, hi!

However that may be going a bit too far, but that is what nearly every amateur does. Please keep the transmitting amateur fed with some decent dope. I am sure quite a few who read your publication will agree with me when I say the short-wave listener is amply catered for by many publications—English and American. It's us transmitting hams, and by that I mean the QRP gang—10 to 25 watts, that are so badly catered for. We see a f.b. circuit and see at beginning of the article, "for 50 to 100 watts." N.G., turn-page over—I honestly believe that anyone who uses over 40 watts and can't raise dx consistently deserves to be fried!—J. M. DAVIE (G2XG), 7, Cranworth Crescent, Chingford, E.4

CRITICISM

I am glad we shall be having some amateur reception notes; if you know what stations are being heard it helps a lot when sending out reports. I must again say that I like *The S.-W.M.* very much and I hope it won't degenerate as time goes on. The only piece of criticism I have heard was about the Radiolympia Supplement. Several members thought it was definitely out of place.—R. F. STEVENS (2BVN), 43, Pettits Lane, Romford.

SOUTH AFRICAN LISTENING

. . . To turn now to s.w. conditions in South Africa, judging by the achievements of listeners in England and U.S.A., as reported in wireless periodicals, we do not appear to be so fortunately situated. Pretoria, in particular, is reported to be a bad spot for s.w. reception.

I do a considerable amount of listening and have at different times sent reports to over 200 s.w. broadcasting stations throughout the world. I'm afraid I'm not a good dx'er however, for I am loth to sit up in the wee sma' hours on the off-chance of picking up some new station.

The Australian stations are our most difficult catches. I have listened to VK6ME, Perth, on one or two occasions lately. VK3LR, Lyndhurst, is usually the best received, while VK2ME is a rare catch indeed these days. Australia is usually best received here about 3 p.m. our time.

Hong Kong, Bangkok and the Java stations are fairly easily heard in the afternoons, while the Tokio transmitters are easy catches.

The Empire transmitters at Daventry are heard like locals, while much the same may be said of Zeesen, Rome, Paris and Prague. Moscow is heard well at times. For a brief period during our winter, the Danish, Norge and Swedish transmitters give fair reception.

The more powerful U.S.A. s.w. stations are well received, particularly about 6 a.m., and the South Americans offer quite a large choice. The Cuban stations come over particularly well. On the whole we have little to complain of though comparisons with reports as stated above makes one wish for better conditions.

Well, I'm afraid I've already encroached over much on your kindness so will now QRT. With very best wishes for the continued success of *The S.-W. Mag.*—J. WILSON, 89, River Street, Pretoria, S. Africa.

THE "S.-W.M." FIELD STRENGTH METER

Its Application and Some Suggestions

By A. J. DEVON

THE INSTRUMENT described and illustrated in September is a worth-while investment for every amateur who is at all interested in getting a proper check on the output of his transmitter or artificial aerial equipment, and the purpose of this article is to point out, first, how a Field Strength Meter can be used, and secondly, how the indicating milliameter on the panel can be applied to other circuits and measurements. It will be remembered that, to allay the qualms of those who might think the purchase of an 0-1 m/a moving-coil meter for an apparently restricted purpose something of an extravagance, it was explained that this meter could be usefully employed in other directions if its connections were brought out separately.

Under practical conditions, one of the things which most interests the amateur transmitter is the effect on the radiation off the aerial due to adjustments of the p.a. stage, aerial coupling, tuning and so forth, since in most cases outside reports are so conflicting—owing to variations in conditions and other operators' differing ideas on signal strength—that it is difficult to form a definite opinion without exhaustive tests. With a Field Strength Meter, however, all this can be quite quickly ascertained with a high degree of certainty, and the comparative effect of adjustments recorded.

● Radiation Efficiency Tests

Suppose that under certain conditions the F/S Meter gives a reading of 0.4 ma. at the base of the mast with the transmitter on 7 mc., then if this reading can be increased to 0.55 ma. by manipulation at the transmitter end of the aerial, it can be taken that the radiation has been considerably improved. This may look very like a statement of the obvious, but the point is that it is very often possible to raise the aerial efficiency when indications on the transmitter itself give a depressing impression of what is happening. In other words, it does not necessarily follow that because the p.a. valve is drawing more power with tighter aerial coupling there is more r.f. going "up the spout." As a matter of fact, the reverse is usually the case, as most amateurs tend to over-load and under-drive the p.a. stage, with the result that though plate mils. are high, the r.f. output and efficiency are low. It therefore follows that, in the example quoted, a transmitter adjustment might be found which, while it would reduce the input to the p.a., resulted in the F/S Meter reading increasing—and it is there that one wants to see the needle going up the scale.

All this is especially true of aerial systems such as the Windom, where it is usually not possible to get any useful indication of what is going into the feeder and where high feeder current often means standing waves on what is alleged to be a non-radiating transmission line.

When carrying out tests of the type outlined above, a point to notice is that the position of the F/S Meter must not be changed about. This is not only because varying readings will be encountered at different places in the field, but also for the reason that some tuning and coupling systems have the secondary effect of altering the wave-form on the aerial; this is particularly so in the case of wires which are rather long for the frequency involved, say 99 or 132 feet on the 14 and 7 mc. bands, and where an impedance-matching network such as the Collins coupler is used with the aerial directly connected.

This brings out another point—that the base of the mast is the best place to set up the F/S Meter when comparative radiation tests are being made, because there is always maximum voltage at the free end of *any* aerial, of whatever type or system. Hence, the higher the radiation efficiency of the aerial, the greater will be the amplitude of the voltage at its end, and therefore the higher the reading on the meter.

If the meter was placed, say, half-way along, and the tuning adjustments suddenly produced a high reading, it would not necessarily mean that the radiation had increased but that the wave-form had been altered, and it would very probably be found that the amplitude at the free end of the aerial had decreased.

When using the particular meter described here in the open, it is advisable to rest it on a wooden box, or something similar, to raise it above and insulate it from the ground.

● Field Pattern Plotting

There is still the question of directional effects to be considered, since obviously the reading obtained at the base of the mast, or any other single given point, has no bearing on the pattern of the field, so that the next thing is—how to plot the shape of the field?

If the location of the aerial is such that one can walk comfortably round it for a hundred yards or so in every direction, it is a fairly simple matter. The meter is held at a fixed distance above the ground, say chest high to permit easy reading of the scale, and the area is systematically traversed, the readings being noted, say, every 20 yards. Very exact yard measurements are not at all necessary, and it can all be done by pacing. Draw a plan of the ground and mark on it the points at which readings are to be taken, and carry this plan with you, the scale of which should bear as accurate a relation as possible to the shape of the ground. If the plan is divided into 20-yard squares, and the area to be covered is 100 yards both ways, then there will be 36 places at which readings must be taken, each of which is marked at its appropriate point. Close to the aerial, there will not be very much variation, due to the intensity of the field, but as one gets further away, there will be rises and falls which will finally indicate the shape of the radiation pattern after the figures have all been taken.

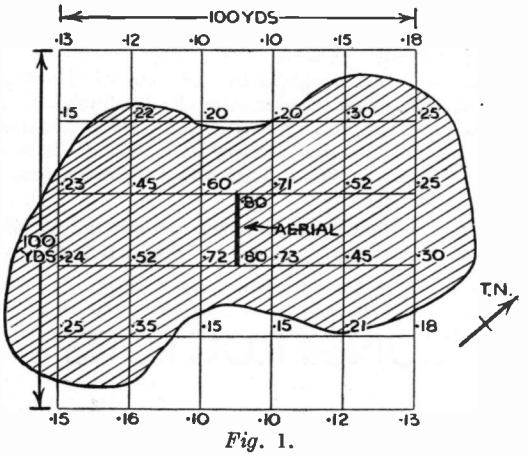


Fig. 1.

The shaded irregularly-shaped figure is the field pattern round a 14 mc half-wave aerial with 60 watts input to the transmitter. The numbers are the readings in milliamps. on the F/S Meter scale. Walking round the full line with the F/S Meter held at a constant height above the ground would give a steady reading of 0.20 m/a. The directivity of this aerial is evidently more or less N. and S.

All this is shown diagrammatically in *fig.* 1, which also shows the range of readings which can be expected, as the diagram is actually a plotting of the field of a 14 mc. half-wave aerial with 60 watts input to the p.a. With lower powers, the readings will naturally be less, and with 10- or 25-watt carriers, the pattern will have to be worked out closer in to the aerial.

When the location of the aerial is in a congested area—the average town site, in fact—the problem is a little different, because then it is obviously not possible to get all round it in the systematic manner described above. By getting into neighbouring streets, alleys and back-gardens—unless the owners of the adjacent properties happen to be disgruntled b.c.l.'s!—a fairly good idea of how the field is shaped can nevertheless be obtained, and the readings plotted on a large-scale map of the neighbourhood. Alternatively, a scale drawing can be made of the immediate surroundings of the site, and readings taken at all possible points, the plotting being done as before.

But probably the best way of getting a check in a built-up area is to apply steady modulation to the transmitter, either by means of a loud-ticking clock in front of the microphone or the re-radiation of the B.B.C. programme—which will cause less b.c.l. interference, by the way, as in most cases they will hear from the local transmitter what they are also receiving direct—and then walk about with a pair of headphones jacked into the F/S Meter.

In the particular instrument under discussion, it will be found that a loud signal is still audible long after the milliameter reading is zero; therefore, one can get much further away when using 'phones, though under such conditions reliance must be placed on the ear to detect the changes in signal strength—in other words, R strength variation. The ability to get further away from the aerial allows a more accurate traverse to be made in most cases, so that if the neighbourhood is thoroughly explored, and R strengths carefully noted, the general field pattern can again be determined. One of the drawbacks of working in this way in a residential area is that one meets curious glances, eventually being tailed by the inevitable squad of facetious urchins, which makes concentration on R strengths difficult. However, it's an ill wind that blows nobody good, for the word also goes round that the Post Office are busy with a new form of unlicenced-listener-detector and there is a minor stampede to get straight! On the whole, it is better to carry out operations after dark, trusting that one will be able to satisfy the bluebottle on the beat.

By the methods described here, the transmitter can be tuned for maximum radiation efficiency and the behaviour of the aerial itself checked on all bands. It is a good plan to take the field pattern under normal working conditions on the bands used, and then see what improvements can be effected, either by alterations to the aerial or coupling system, all this data being logged for future reference.

As a rough guide to what can be expected, readings were taken on the five bands 1.7 to 28 mc. with approximately 10 watts input in each case and the F/S Meter located at the base of the mast. The readings decreased from 0.6 ma. on 1.7 mc. to 0.15 ma. on 28 mc., the mast height being thirty feet.

● Other Applications

Inside the station, the F/S Meter can be used for a variety of purposes. First, as a "side-tone" for modulation checking, when the speech in the carrier will be heard in a pair of 'phones with the meter tuned to the transmitter frequency. Often, due to the concentration of the field in the station, readings are lower than they are outside, and the instru-

ment has to be placed within a few feet of the p.a. tank or aerial coupling network in order to get a figure of 0.2 or 0.3 ma., a convenient value for speech checking. Correct modulation effect is indicated by slight upward kicks of the needle as the microphone is spoken into, though under normal operating conditions the adjustments should be made such that this movement is not quite obtained, as it actually means that the carrier is being over-modulated. "Downwards modulation" is likewise shown by negative flicks of the meter needle.

Due to the fact that the simplest type of rectifier —a diode—is used in the F/S Meter, it can also be employed as an absorption wavemeter, either for receiver or transmitter. In the former case, coupling is obtained by coiling the end of a length of flex two or three times round the detector grid winding in the receiver, the other side being connected to the stand-off insulator on the meter box. Naturally, no reading will be seen on the scale, but the characteristic absorption effect will be heard on the receiver when it is oscillating and the two circuits are brought into resonance. Thus, the meter can be roughly calibrated from the receiver, and by applying it to the transmitter in the same way, the setting of the latter can be verified. This is particularly important where one is working with drive circuits such as the tri-tet, which will often give the third and fourth harmonics as well as the second, and can result in the transmitter finally being tuned up outside the band.

A neater way of getting the coupling than that described is to put a few turns of wire at the earthy end of each of the coil formers; the windings should be in the same direction—about 5 turns for the 1.7-3-5 mc. coil, 3 for the 7-14 mc. and 1 turn, spaced half an inch away, for the 28-56 mc. coil—one end going to the earth pin on the former and the other to the spare leg. A connection from the corresponding terminal of the valve-holder is taken to a small s/o insulator or insulated terminal, a similar terminal being mounted alongside and connected to the box. The extra winding so formed comprises a link coupling and by bringing the other end of the link from receiver or transmitter to these two terminals, a better coupling effect is obtained. Keep the transmitter link very loose, however!

● Using the 0-1 m/a Meter

As previously mentioned, the meter can be worked in conjunction with other apparatus while it remains on the F/S Meter panel by bringing its connections out separately. The applications of an 0-1 ma. moving-coil instrument are many—in a valve-voltmeter, an ohmmeter, a multi-range test-set for both a.c. and d.c. (if an instrument rectifier is incorporated) or simply as a shunted milliameter for high current readings.

This is particularly so in the case of the Sifam milliameter specified for the F/S Meter, as its 2¼-inch scale is clearly divided into 20 graduations and interpolation for getting half-divisions is easy, which means in effect that the 0-1 range can be read in fortieths.

If you still think an 0-1 ma. moving-coil meter is an expensive luxury, please write and tell me why!

USEFUL HINTS FOR CONSTRUCTORS

When using electrolytic condensers following the mains transformer in a voltage doubler circuit, the positive of one condenser and the negative of the other should be joined together and the junction taken to one end of the h.t. winding of the transformer. The remaining positive and negative should, of course, be connected to the corresponding terminals of the metal rectifier.

* * * *

To prevent unwanted resonances, it is a good plan to glue odd shaped pieces of wood to the back of the baffle board, or in the case of a cabinet mounting, to pack the corners with a non-resonant material such as wool.

* * * *

A useful black enamel can be made by mixing finely powdered lamp black in ordinary clear varnish. About one part of lamp black (by weight) to ten parts of varnish, really well mixed, will give an easily workable consistency which produces a good finish. It will be found particularly suitable for metal panels, etc., and will "wear" well. The writer has made good use of this enamel for several things—the one great advantage is that you need only make up the required quantity and the only drawback is that it takes two or three days to harden.

* * * *

A simple method of ascertaining the polarity of charging wires is to insert the ends of the wires, about one inch apart, into half a potato. When current flows a green ring will appear around the end of the positive lead.

* * * *

Tinners' solder, the most used for normal radio work is composed of equal parts of tin and lead with .012% antimony. When undertaking delicate work, such as in soldering fine instrument wire when there is a very real danger of burning the wire, it is as well to remember its melting point. Melting begins at about 358% F. and liquidation is complete at 415° F.

* * * *

Anode dissipation of a valve denotes the power used in heat at the anode. To ensure long valve life the negative bias should be so adjusted that the anode current never exceeds the stated value.

"HAVE YOU HEARD"—*continued from p. 5.*

signal; its compatriot HH3W on 31.00 m., operating until 01.30 and XEBT on 50 m. All with the exception of YSN have been heard quite often but a diligent watch is being kept for it since Salvador does not furnish any other broadcast transmitter. VK2ME has been a notable absentee from my log for some time although, I dare say, it is audible during its early Sunday morning session which I can never force myself out of bed to hear! I intend to wait until the middle of winter when it will be possible to learn of Australia's natural beauty and sun-bathing from my armchair in the middle of our dull and dreary afternoons without the dissipation of energy or loss of sleep! Furthermore I expect to wander from continent to continent at random; from the NIROM's recorded programmes or football matches to Milwaukee's local news radiated by W9XAZ (11.363 m.); VQ7LO's famous 6-pip time signal in the evening and then for a grand finale of Latin-American tangos, boleros and paso-doblas, and possibly a spot of XECR's educational propaganda, before turning in once more. Yes, short waves are a boon in the winter, especially those isolated from the outer world!

Mention of XECR reminds me that few people ever report reception of this interesting station. Last winter it was frequently audible from about midnight on Sundays on 40.65 m. with programmes of Mexican prose and music, and many of the announcements in English. Their power was given as 20 kw., but their QSL card turned out to be rather disappointing, hardly characteristic of what we are accustomed to from Latin-America. Reports on these transmissions should be addressed to "Estacion XECR, Departmento de Publicidad, Secretaria de Relaciones de Exteriores, Mexico City, Mexico." Another, and undoubtedly better known, Mexican is XEWW, mentioned in my last article, which has returned to its original wavelength of 31.58 m. where it may be heard from about 02.00 interfering with HJ1ABE of Cartagena.

"FROM S.W.L. TO FULL LICENCE"—*continued from page 6.*

7-pin base, by the way: the filament pins are close together, and, looking at the base in clockwise direction the pin next to filament is a dummy, then follow anode 2, grid 2, grid 1 and anode 1.

This time when the set was tuned, the milliameter read 18 mils. If you monitor your transmissions on the receiver, a considerable rise in strength is seen to coincide with the meter dip. If the rx was fitted with an R-meter, I have no doubt you could plot graphs between the condenser reading and signal strength, or various similar curves, which prove quite interesting. You might also notice the effect on your note, but perhaps you have already done these experiments with your oscillator.

Well, I think that is about all I have done this month, so I will leave you to your own researches into the deep mysteries of c.o. and f.d. until next month, when I hope to meet you again to discuss the next stage of our transmitter.

QUERIES

1. There is a resistance across the crystal; what is its function and value?

   When the valve oscillates, grid current flows through the resistance to the grid. When current flows through a resistance the resistance causes a voltage drop, i.e., the two ends of the resistance are at a different voltage. This difference of voltage is utilised to provide bias voltage for the grid. The value of it is not critical, anything between 10,000 and 500,000 ohms.

2. The circuit coupled to the anode coil; what are the values of the resistance and condenser? I presume that this circuit is the artificial aerial.

   This artificial aerial circuit consists of a condenser and coil of about the same characteristics as those used in the plate tuning circuit. Resistance represents meter load.

3. Instead of listening to the transmissions on a receiver would it not be better to put a pair of 'phones in the h.t. + lead?

   The 'phones cannot be inserted in the transmitter.

"RADIOQUEST"

Armchair Understanding of Radio Riddles

Conducted by RAY CORTON

BEFORE WE SETTLE down to the second of these articles I would like to thank those readers who have written letters of appreciation. Many have said, "Radioquest seems to be just the thing I have been looking for but I suppose it will soon become more technical." To these and other beginners who harbour the same suspicion I would repeat this series is not to become progressively more difficult, but will continue to be a simple survey of radio taken from a different angle each month. From these letters I am still more confident that by this method you will gain a very comprehensive knowledge, and if at a later date you wish to delve into the subject more deeply, you will have a foundation into which the more detailed information you find in other articles and standard books will fit in like the parts of a jig-saw puzzle.

A considerable number of question arose from last month's article which I must deal with before proceeding further, although it will entail falling a little behind schedule of what I had hoped to cover. However, as all these points have a very important bearing on design it is perhaps as well we should clear them up first.

● Aerial Power

Quite a number of people having clearly grasped that a fraction of the radiated energy is "caught" as it passes the receiving aerial, ask how much this would be for an average signal. There can, of course, be no such thing as an average signal, but if actual figures will help you to visualise it better, I might mention that from a fairly local ordinary broadcast station it would be, perhaps, a thousandth part of a volt but from a distant amateur station more than a few millionths of a volt could not be expected. Please don't let that frighten you from attempting short-wave listening with small and simple apparatus. A single-valve receiver with quite ordinary parts is very well capable of picking up low-power transmissions over extraordinary distance and a second valve will amplify them up to moderate loudspeaker strength. THE SHORT-WAVE MAGAZINE Class B receiver is a fine example of this type of set—a two-valver with the two valves in one glass envelope—which, by efficient design, brings in strong signals from all parts of the globe. Very many hams and keen dx listeners prefer small receivers of this description as they contend, with a very large measure of truth, that it is not so much a loud signal that is required but a high signal-to-background ratio. We will return to this when we consider how background is affected by selectivity.

The question of power in the aerial is most important because, ignoring rectification for the moment, a receiver is actually an amplifier which magnifies the tiny fraction of a volt picked up by the aerial to the hundreds of volts required to work the loudspeaker. At once you will realise that the greater the voltage picked up by the aerial the less amplification will be required.

● The Importance of Good Insulation

Although a receiver with tremendous amplification can be made, internal noises, such as those made by the valve filaments, will come into prominence when the set is turned "all out," so that a good aerial means that less amplification is needed and therefore the background noise is less. The voltage in the aerial is actually the voltage between the aerial and earth. If this voltage can leak to earth it will do so, and may result in only half of that tiny amount reaching the receiver, proving the absolute necessity for the best aerial insulation possible.

In a laboratory the performance of a receiver is calculated by the minimum voltage required between its aerial and earth terminals to give full output; the lower the input voltage required the better the receiver. You may see receivers with their performance stated as "One microvolt absolute sensitivity" which means they will give full output with one microvolt between the receiver's aerial and earth terminals. A microvolt is one millionth of a volt.

● Another Advantage of Short Waves

On your broadcast set you may have up to seven valves and yet you find that a three-valve short-waver gives better results on Schenectady than the bigget set does on Leipzig. On normal broadcast waves atmospherics and other noises are far greater than on the short waves, and broadcast stations consider that a certain aerial voltage is required to overcome these to provide satisfactory reception. Usually a hundred microvolts is taken as a suitable figure, but on short waves a signal of ten microvolts will give as good, if not better, reception. Hence on short waves it is possible to amplify up a signal which would be lost under the "mush" common to the medium waves, and the ten microvolt signal which we could not hear on the medium waves gives us perfect loudspeaker reproduction on the short waves.

Atmospherics

Everyone knows the effect of atmospherics, which are electrical disturbances in the lower layers of the atmosphere caused by lightning discharges. It is not so much the disturbance caused by a single atmospheric as the frequency at which they occur that upsets listening. Because of the enormous power of these disturbances they may seriously interfere with reception a thousand miles away and thus listeners in temperate zones are often more upset by atmospherics occurring in tropical regions than by local storms. As we go lower in wavelength the effect of atmospherics is less noticeable and when we get below 15 metres their effect is quite negligible even during the summer months when they are at their worst.

In designing a receiver we aim at a certain standard of selectivity. This determines just how much of a waveband shall be admitted at any particular tuning setting and as we let in a certain amount of disturbance with the selected signal you will see that high selectivity is no less useful in minimising atmospheric noise than in excluding unwanted transmissions, so selectivity also has a very important bearing on background-to-signal ratio.

Wavelength

Last month, in explaining wavelength and frequency, I mentioned that all transmissions were of a definite wavelength. This wavelength is determined by the amount of inductance and capacity in the transmitting aerial circuit and to receive the transmission it is necessary to reproduce a similar condition in the aerial circuit of the receiver. As wavelength is the product of inductance and capacity it naturally follows that we can increase or decrease the wavelength by increasing or decreasing either. The aerial tuning coil will receive a transmission of a certain wavelength only and so to alter it to tune to a greater or lesser wavelength we have to add or take some turns away. This is in effect precisely what is done by using the old-fashioned slider or taking tappings from the coil to a switching arrangement. But as we can also vary the wavelength by adding capacity the same effect can be achieved by connecting a variable condenser across the coil (in parallel). Apart from being more convenient it is in many ways better practice. As you have already seen it is volts in the coil we require instead of capacity added by the condenser to obtain the greatest efficiency so we must arrange our tuning to have the smallest proportion of capacity to inductance as reasonably possible. The beginner might well ask why not use a slider or tapped coil—very simply stated the answer is that by having an unused part of the coil in close proximity considerable loss would be sustained through absorption by inductance of the precious energy in the used part of the coil, into the unused turns.

Tuning

Thus within reasonable limits we vary the wavelength by capacity as it is more convenient in the first place and if we keep the capacity-to-inductance ratio low we have the maximum voltage in the coil. Therefore we make the coil to tune of itself to just under the desired waveband and increase it as little as possible by the addition of capacity. By closing the condenser, that is bringing a greater area of the vanes in closer proximity, we increase the wavelength by capacity and that is why you are always advised to use the next larger coil when you find a station coming in at a point where the condenser is approaching fully "closed," or in a commercial set to switch to the next wave-range when the indicator nears the top end of the tuning scale. When, by adjustment of the tuning circuit (represented by the coil and condenser in a simple receiver) the exact conditions prevailing in the transmitter is reproduced the two are said to be in resonance, that is, they have identical electrical values.

Remember the golden rule—the more coil (inductance) and the less condenser (capacity) used to accomplish this the greater will be the efficiency, but there is one point we must not overlook. Do *not* go to the extreme and attempt to make a tuning circuit without using any capacity across it, because you will run into another trouble. The coil might be as efficient as possible, but the aerial would affect its stability. The aerial itself has capacity, and when it swings in the breeze, as it will do, that capacity will alter and it will act in a similar manner to varying a tuning condenser. Thus the station you would be trying to listen to would swing "in" and "out" of tune. In practice with simple sets it is necessary to have a little capacity across the coil, because the difference in capacity caused by aerial movement is only a small percentage of the tuning capacity, so it makes no noticeable difference, and the station "stays put."

All conductors have a certain inductanee and capacity so the aerial wire itself, having a combination of these two, will have a natural wavelength and it can easily follow that this, together with the tuning circuit, will give a higher wavelength than that of the transmission we seek to receive. Let me hasten to assure you that this last sentence applies to the ordinary sort of receiving aerial—the natural wavelength of the aerial is overcome by special arrangement, but as last month I said you can use your ordinary broadcast aerial with success for short-wave work it is a point we cannot overlook. We can reduce this natural wavelength by connecting a condenser (either fixed or variable) in series with the aerial, that is connected between the aerial and the coil, which explains the presence of this component in nearly every short-wave circuit you see, although it need not be used when employing a doublet or other special types—but the reason for that requires much explanation and must be left for a later article.

A Series for Would-be Constructors

With no previous knowledge YOU can build this simple and cheap aid to Morse learning, and later construct receivers, etc.

By S. W. CLARK

THIS SERIES is in answer to letters received by the Editor requesting articles for the listener who knows nothing of construction but wishes to make a start. Many express apology for asking questions that to us might appear too simple for attention; a far greater number fear revealing ignorance by availing themselves of a service which they as readers are entitled to receive—these readers need have no hesitation, their enquiries will receive the same consideration as those from our friends who are more capable.

It is often necessary to refer enquirers to earlier issues of the magazine, it being impossible to cover the subject requiring explanation in a letter. This practice will apply when newcomers to this section need explanations that have appeared: the course will be progressive and it will therefore be assumed that readers digest each section with a view to assimilating the text in such manner that retracing is unnecessary. On the other hand, any points demanding enlargement will be of course clarified.

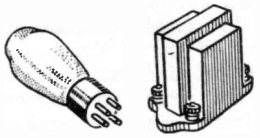
A theoretical circuit does not show the layout of components. Some constructors have attained such knowledge that their only requirement is a theoretical drawing; all values can be assessed and parts assembled to give the results obtained by the designer. However, few reach this stage and consequently clues are given with the result that a circuit is apt to degenerate into a meaningless jumble to the intelligent constructor; the novice is able to build the gear, but that is all—he has to wait for his pet designer before he can construct anything else and is unable to enjoy to the full other articles.

It is not intended to discuss theory in this section; the idea being that this month you make the unit and later Ray Corton will tell you why, say, the valve oscillates.

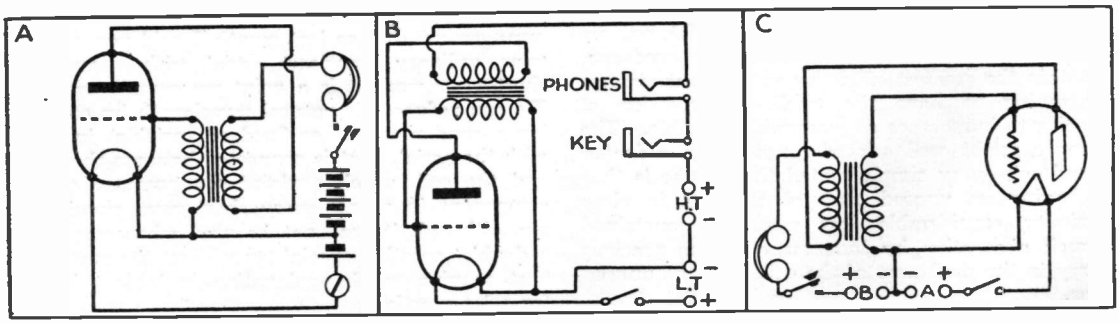
The photograph opposite is that of a simple single valve unit which gives, in a pair of telephones, a high-pitched whistle similar to those Morse or continuous wave (c.w.) signals heard on any receiver. This note is interrupted by operating a Morse key, thereby providing the constructor with a method of learning the code.

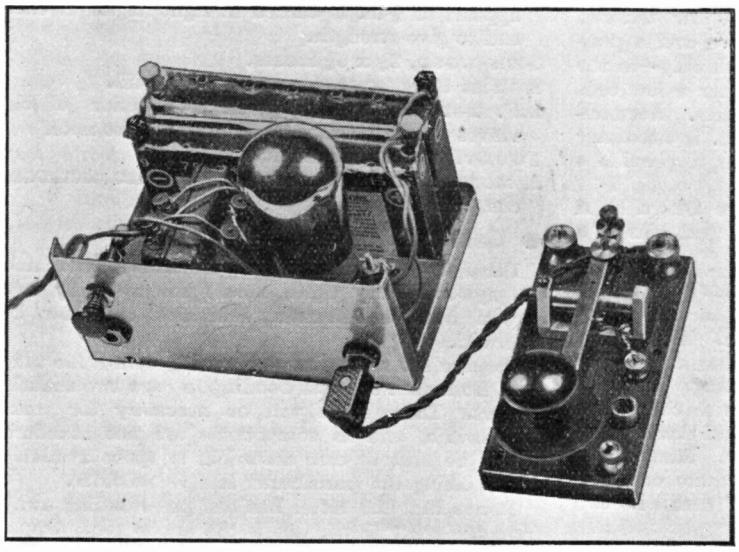
We shall study future circuits drawn in the fashion of "A," but in order that you may appreciate other methods of illustration two more are shown, all three represent the identical oscillator pictured.

● Transformer and Valve



Commencing with "A," we see at top left a circle with three internal elements (electrodes): top, anode or plate; a grid in the centre; filament at the bottom. All grids, anodes and filaments are drawn as shown but sometimes you will see multi-electrode valves with a number of grids (dots) and anodes (short horizontal line). The complete symbol is a valve and this particular type is termed a triode because it has three electrodes. The fact that we can discover the number of electrodes is not sufficient, for triodes are made for various uses and in consequence





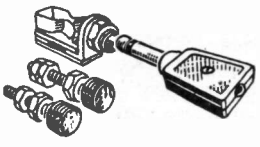
the designer either refers to the type on the circuit or by text reference. However, in our case the characteristics of the valve are of little consequence —you can use one designed for rectification (commonly termed a "detector") or l.f. (low frequency) amplification.

Passing to "C" we find the valve shown as in American theoretical circuits. We give it here so that future contact will not leave you wondering if an English counterpart will function.

Besides the valve illustrated opposite is shown a transformer, this is drawn immediately to the right of the valve in "A." There are three types: high and low frequency and mains. We are concerned with that type made for handling low frequencies and consisting of a primary and secondary coil of wire wound round metal laminations (the thick strokes between the coils). The casing sometimes has a fifth connection, this is for joining the core to an earthing point; as we require no "earth" in our oscillator we will forget this extra terminal, but as a general rule use it for this purpose.

Probably you will come across an old transformer marked OP, IP, OS and IS, these markings signify "output primary" and so on, but nowadays the relative markings (in the sequence above) are: HT, Plate, Grid and GB. The specimen used in the photograph had no markings at all! More about this in a later article.

● Terminals or Plugs

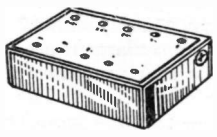


Continuing still further to the right we notice the first difference between "A" and "B." Telephones are easily picked out in the former, but in the second illustration an example is given of a departure from a true theoretical circuit: down the right hand side are given words and letters instead of symbols.

Another difference is that the telephones are shown to be connected via a jack (see illustration). There are three ways of connecting 'phones: (1) Take the two ends direct to the points indicated; (2) Mount terminals, wire from these to the appropriate positions, then attach the 'phones; (3) The third method, which is recommended, is to wire the earpieces to a plug (illustrated) and at the set end connect to a jack. This saves time in changing 'phones from one instrument to another.

The Morse key can be inserted in the same manner. Key shown in photo is by courtesy of Electradix Radios.

● High Tension Battery

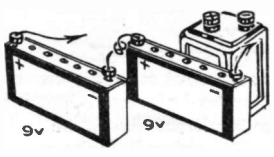


Although we are not using a battery of the type illustrated here this is the kind usually associated with the long thin and short thick lines sign below the key, and is called the high tension battery. These batteries are made up of 1½-volt cells to give voltages in the region of 60 or 120; one socket is marked negative (—) and each of the remainder provide various voltages for the positive (+) plug.

It may be difficult at first to remember quickly which are the positive and negative ends of battery symbols: it is easy if you familiarise yourself with the fact that the theoretical *short thick* line is also shown thus on the battery itself.

Always remember to remove the negative h.t. plug whilst making alterations: if 100 volts go on the wrong spot it may cost a greater sum than the customary and certainly more effective displays to be seen at this season of the year!

● Grid Bias and Accumulator

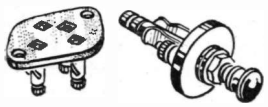


As mentioned above, we do not require 60 volts h.t., 18 volts will suffice. The illustration shows how to obtain them and at the same time acquaintance is made with the appearance of g.b. (grid bias) batteries—miniature h.t.'s—(there is no need to discuss their more usual purpose here). The plugs shown inserted in the battery are known as "wander plugs"—red for positive and black for negative: these colours apply to — and + where the polarity is to be shown by colour.

An accumulator is used for l.t. (low tension) supply and is expressed by a negative and a positive stroke; here we can show one cell only—in the case of h.t. it is sufficient to give only a few cells with exact voltage in the list of parts. Accumulators give two volts, and if more l.t. is necessary then two or three are joined together to provide 4 or 6 volts.

Referring to "C," l.t. and h.t. are shown as A and B batteries respectively, whilst grid bias is a C battery.

● The Switch and Valveholder



Last on our circuit is the switch. This simply breaks the circuit by disconnecting the l.t. supply—with the switch "open" and therefore no heating of filament, h.t. will not flow. Many types are available, but for this job we require one that in the "on" position places a "short" across its two terminals.

The left-hand illustration is referred to later.

● Following the circuit

Now glance at "A" and try to follow three circuits: (1) When the switch is turned current flows from accumulator — through valve filament and back to l.t. +. (2) Electrons from filament are passing through the grid to anode and via transformer primary, 'phones and key to h.t. +. (3) The grid has a negative bias from l.t. — through transformer secondary.

Having seen the ease with which this may be traced with the aid of "A" try it with "B" and it will be appreciated that the gaps down the right side have to be mentally closed where necessary, whereas the former diagram conveys at a glance the complete circuit.

● Parts required

The component parts shown may be gathered from the junk box, but where no such stock exists the following will have to be bought, begged or borrowed!

LOW FREQUENCY TRANSFORMER.—The ratio of primary to secondary turns is not important, one of 1:3 or 1:5 will be suitable.

4-PIN VALVEHOLDER.—That illustrated above is a type for mounting on the chassis, the pins protruding for wiring underneath. If it is decided to do all wiring above chassis then a baseboard-mounting holder is necessary.

SINGLE-POLE, SINGLE-THROW SWITCH.—The type shown will serve our purpose, but a toggle switch (a miniature action similar to household lighting switches) provides a more workmanlike finish.

TWO OPEN-CIRCUIT JACKS.—Close-circuit jacks cause a connection to be made when the plug is withdrawn; and

TWO TELEPHONE PLUGS; *or*

FOUR TERMINALS (two red and two black).

One yard of CONNECTING WIRE, this should be of about 20 gauge and covered.

A piece of ALUMINIUM, 6 inches by 3. Only $5\frac{1}{2}$-ins. appear, as $\frac{1}{4}$-in. is turned at right angles at each end to give strength.

3-PLY WOOD, $2\frac{1}{4}$ x $5\frac{3}{4}$ inches.

A "Flat Fifty" CIGARETTE TIN, discard lid.

L.F. 2-v. VALVE.—If possible a selection of old valves should be tried to obtain the best note.

TWO 9v. GRID BIAS BATTERIES.

A MORSE KEY, TELEPHONES and 2v. ACCUMULATOR, complete the list.

● Construction

Place the two batteries in the shallow box and fit plywood fairly tight, secure the wood by two screws from underneath. Batteries can now be removed.

Prepare the aluminium by scoring with a file tang $\frac{1}{4}$-in. from each end and bending to form two shallow flanges. Three holes will be necessary for jacks and switch, and as components are not standard it will be best to drill according to space available after placing the transformer and valveholder.

Notice that the latter has one pin standing away from the other three, this is the anode pin. Opposite is that of the grid, the two remaining are filament—it does not matter which of these is connected to — or +.

When placing the components turn them about so that connections will be as short as possible; although no ill effects will result in long wires here, a short-wave receiver must have short grid connections.

Fit the two jacks with especial regard to insulation. If they are of that type where the locking nut is connected to one of the contacts it will be seen that both must be insulated from the panel, otherwise a short circuit will be made. The best method of insulating is by using Bulgin special fibre washers.

The panel should now be fitted by three small wood screws through the tin to wood base.

● Wiring up

Commence by wiring grid to one side of secondary on transformer, other end of sec. to that filament pin chosen for l.t. —.

Plate to one side of primary of transformer, other end of primary to 'phone jack contact nearest panel.

Tip of 'phone jack to panel end of key jack, the free end of key jack to take a flexible wire for plugging into positive h.t.

One side of switch to positive valve filament, other filament has a lead to accumulator positive.

The h.t. and l.t. negative leads are joined to the negative filament terminal.

Check wiring and insert valve; plug in h.t. and connect l.t. Now switch on and depress key. If no signal is heard switch off and remove h.t. plug and try reversing the primary *or* secondary connections, whichever are the most convenient. Varying the h.t. voltage will change the note. The valve shown in the photograph gives a genuine signal with only $4\frac{1}{2}$ volts h.t. and is a Mullard PM2 at least six years old. It was found that the majority of valves tried required a greater voltage, some would not oscillate unless 30 volts were applied.

On the Amateur Bands

"Ham" News by G5GQ

A FEW WEEKS AGO I had a QSO with GW6YQ on 7 mc.; actually we were both on the frequency of 7,015 kc. and were just getting down to business when one of the Spanish Onions started up dead on our frequency, and wrote "Finis" to our chat for that evening. The input at my end was about fifty watts, but my R9 signal couldn't get through the racket.

This week I have had two 100% contacts with GW6YQ, no QRM, but this time on 1,775 kc. and using three watts from batteries. Yes, the three watts on 1,775 was better than the fifty on 7,015 kc.! And the latter job is probably causing QRM in VK when I am trying to work locals!

We've got to tackle this QRM business ourselves, before it is done for us, and to our own discomfort. The band used should be chosen for the distance to be covered. The use of 14 mc. and 7 mc. for work between local stations means that high power has to be used owing to attenuation, whereas choice of a suitable band would mean low power, less expense, and less QRM to everybody.

For local work, up to 150 miles, 1.7 mc. is the ideal band; there is very little of the indirect signal business, and we can be certain that we are not troubling stations thousands of miles away.

BCL interference is absent provided low-power c.w. is used, and the results obtained here prove that 5 watts should be ample for all normal requirements.

Let's try and use this band for internal contacts. It's nice to talk to the local fellows, and leave dx alone for once in a while.

● Club Use

Most of us go along to the local radio club to yarn, so why not have local "get togethers" on 1.7 mc.? Members living a fair distance away could then join in, and, in addition, it would help clubs to make contact with kindred societies. All that is required is for the club to announce that a 1.7 mc. ragchew will be held, say, every Wednesday from 8 to 9 p.m., and the job is done. Beginners would be able to get some slow Morse practice, members could discuss dx, etc., and gradually the local work done on 7 mc. would be shifted to the more appropriate band.

Now please, some of you club people, do wake up and let me have your reactions to the idea.

● 1.7 News

6FO, with whom I have already had a contact on this band, writes me that activity is increasing in the West. On a normal Sunday morning he hears 20 stations within the hundred-mile range, and can easily contact them with 9 watts. After dark he gets R7-8 from all over the country.

GW6YQ, during our QSO, told me that at week ends it is quite easy to work continentals, and he has worked one of the Swedish boys during a Saturday afternoon.

G5OH at Bournemouth is running schedules with G6GM, Holsworthy, N. Devon, and is on every Sunday morning from 9.30 a.m. Rig is two Tungsram 15/400's in p.p.

North London seems pretty active on this band, and several new stations have appeared during the last week, but South London is as dead as a burnt-out bottle. The last time I heard one of them was about two years ago; W8DML was visiting me and Ham Whyte (6WY) worked us duplex on 1.7, only we had to come back via landline.

● The Midlands

George Brown (G6BJ) writes that he is now able to give the whole of his time to ham radio! Listening on 14 mc. I didn't see anything new in this, judging by the way every other W heard is calling G6BJ! However, what he means is that he has now joined Webb's at Birmingham, and is doing there what 2NO is doing at the London branch.

Ten metres is taking the Midland crowd off 14 mc.: G6PL, G5VM, G2LB, and G6BJ all having gone down. BJ is using 53-RK25-RK25-HF100, with 250 watts input, modulated by a couple of 4211's. He says the band is open from 10.30 to 22.00, and he has had some good contacts with VK, VU, LU, and all districts U.S.A., getting average R8.

● Quality Phone

Talking to some of the "locals," the old question of power was raised. Oh no! not the usual complaint—this time it was about quality. The argument was that, with a fifty-watt permit, the lad who likes high quality 'phone cannot afford to use class A modulators, and will not use AB or B on the score of quality. He can turn out decent stuff by using suppressor, or low-level modulation, but for his fifty-watts input only puts fourteen watts in the aerial. His pal down the road uses alleged class B modulation—only the class is missing—and slams 100 watts of audio on to a fifty-watt carrier, with an aerial power of fifty watts plus odd noises. The high quality man says that power should be rated on aerial power, not input.

It's an interesting argument: commercials are rated on aerial power, but they measure, whereas we guess. Assuming the P.O. could be induced to grant power on this basis, would we have to measure it, or would the inspectors do it for us?

N.R.S. MEMBERSHIP OVER 500 AND STILL GOING STRONG

By Leslie W. Orton, Secretary.

IT IS WITH profound satisfaction that I am able to report that our progress has outstripped all my expectations during the last month. Not only have we reached and passed the five-hundred mark, but we now have members in Norway, India, Australia, New Zealand, South Africa, Venezuela, Ceylon, U.S.A. and the Irish Free State.

This progress has been made largely through the endeavours of our representatives and members, and I wish to once again thank you one and all for your co-operation.

● Our Competitions

Our short-wave and county competitions are continuing and the "state of parties" is as follows:

NRS6, Mr. Albert Park, Lancs. Rep. 1st place.
NRS14, Mr. R. S. Stevens, Essex. 2nd place.
NRS75, Mr. J. G. White, Dublin. 3rd place.

The short-wave competition is being led by Mr. L. Levitt, NRS53, of Leeds, who sends in some very attractive cards.

● Local News

Our Lincoln Representative, NRS8, Mr. G. F. Shepherd of 287, Wragby Road, reports that the Lincoln Short-Wave Club (a branch of the NRS) was formed recently. Meetings every Tuesday at 7.30 at the Technical College.

The Dublin Branch hold weekly meetings and members are invited to write to Mr. White at 18, St. David's Terrace, N.C. Road, Dublin, I.F.S.

London members (and any Christmas visitors) are invited to write to headquarters at 11, Hawthorn Drive, Willowbank, Uxbridge, saying whether they would be willing to attend the NRS Christmas Party at Uxbridge. A small charge will be made, to help defray expenses and members are asked to bring a partner—dx'ers are fine company, but we want a few of the fair sex at a dance!

A meeting is held every Wednesday evening at 8 p.m. at 24, Penrith Street, Streatham, S.W.16. All N.R.S. members are welcome. 'Phone: Streatham 0405.

● News Sheets, etc.

As you probably know, Essex and Lancashire issue their own News-sheets, these include local items of interest. Mr. R. F. Stevens, at 43, Pettits Lane, Romford, Essex, and Mr. Albert Park, at 14, Fairfax Road, Prestwich, Manchester, will supply particulars. Mr. Park also runs the QSL Bureau and will forward details for a stamped postcard.

Our Chelmsford joint representatives, Mr. M. R. Gershon and Mr. J. F. Cunningham (NRS43 and 238) of 32, Park Road, Chelmsford, are running our Short-Wave Commercial 'Phone Station QRA Service. Mr. Stevens (Essex rep.) is running a Broadcast QRA Service, and Mr. Gershon our Translation Service. In all cases a stamp-addressed envelope should be enclosed for reply.

● HQ Tour

Plans are being considered for headquarters to conduct a tour throughout the country in the near future. Demonstration of receivers would be made.

We shall be pleased to hear from members or representatives who would be willing to organize the affairs in their town—please write soon so that arrangements can be made—I'm looking forward to seeing many of you in this way.

In conclusion I would like to invite all of you who are not members to join our organisation. Send a postal order for 1s. to me and you will receive a membership card and notepaper by return.

● Latest Services

Latest services include a magazine scheme whereby magazines are forwarded from member to member in much the same way as a chain letter. Those wishing to be included in the scheme should send a penny stamp with their name and address to HQ.

We are also forming a circuit service, and many other new services, so come on.

BOOKS REVIEWED

TWO BULGIN PUBLICATIONS

Two books of interest to the constructor and published by Messrs. A. F. Bulgin are worthy of review. "Radio Service Manual" consists of 72 pages packed with general information for experimenter, serviceman and dealer who will find within these pages reading matter and simple diagrams (both pictorial and theoretical) appertaining to radio theory and construction. The novice will be able to share the pleasurable reading, as particular attention has been paid to his requirements in the provision of really simple drawings and lucid text explanation. A short treatise on the function of many components makes the book a valuable reference.

"Radio Progress No. 3" is the second title and therein are tested circuits of a range of apparatus that is wide. Superhets, vibrator units, simple receivers and a pocket amplifier serve to show the extent of modern design incorporated. Each receives the fullest consideration and the system of wiring, etc., leaves no doubt that with this book constructors will feel safe in attempting reproduction of the originals as illustrated by clear photography. The nominal price is 1s. for each book.

G5NI (BIRMINGHAM), LTD.

We have recently received literature from this firm setting out their short-wave receiver and component stock. If your requirements lie between a £40 short-wave receiver or a resistor (well-known make) at 4d. G5NI can supply, and with service.

USING THE DUPLEX CRYSTAL ON 1·7 MEGACYCLES

By G5GQ

DURING OCTOBER, the "Duplex" crystal, first described in our last issue, has been under test for 1.7 mc. operation. We had all sorts of schemes for beautiful-looking transmitters for this band, but after sorting them out, we scrapped most in favour of the simplest possible rig.

Our reasons for building this particular design are no secret, so first of all we will explain our ideas so that you may modify if the design is not suitable for your particular purpose. The requirements we considered essential were:

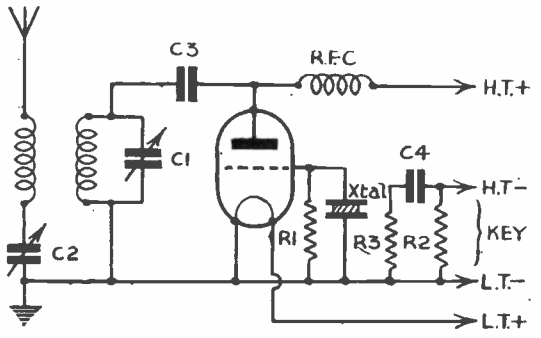
1. A range of 50-75 miles, using the ordinary 7 mc. aerial.
2. Operation during broadcast hours.
3. A transmitter so cheap in construction that it could be used as an "extra" piece of equipment, rather than an all-band outfit.

Cost is the main item to most amateurs, so let us consider the third requirement first.

This resolved into battery or mains power. We can all scrounge a hundred volts or so of h.t. batteries, but a spare power pack is an expensive matter, so battery power was chosen. This immediately covered the second requirement, broadcast interference, because batteries compel the use of low power, and having no ripple are less likely to cause interference than the mains.

For reasonable life from the batteries the very maximum power will be five watts, so that the use of a simple crystal oscillator in preference to a CO-PA rig was indicated.

Range was the last remaining problem. Would five watts be sufficient? We were rather sceptical, and only used three watts so that the worst would be known, but to our intense surprise the night range proved to be 250 miles with an RST569 signal, so 50 miles should be well within range during the poorest conditions.



● Circuit

The circuit finally used is shown in *fig.* 1, and is a perfectly standard parallel-fed oscillator. Both series and parallel feed was tried, with no measurable difference in output, so parallel was adopted to allow all tuning condensers to be mounted direct to the earthed panel.

The use of a triode will evoke comment since pentodes are the fashionable valve for this service. We tried pentodes and found the best output to be given by two—a QPP unit with the two pentodes in parallel. With an input of 150 volts at 25 mils. to the anode the current in the load circuit was 0.94 amps, compared with the 0.91 amps obtained with the PX230SW finally used. This looks as if the pentode is the best valve, but note that the power is only the anode power, not the total. The screens of the pentodes took nearly another 20 mils, so on total consumption the pentodes take nearly double the juice for the same output as does a triode! Of course with mains power the power wasted in screen current doesn't matter, but with batteries every mil counts, a point forgotten by many designers.

The final point in the design is the choice of the PX230SW in preference to the standard PX230. The difference between the two valves lies solely in the grid being brought out to a top cap in the SW type, an improvement when used at high frequencies. Electrically it does not matter which type is used, but mechanically the SW was used because it allowed the crystal to be placed in an easily accessible position so that it could be removed quickly when wanted for frequency meter, or other work.

● Construction

The transmitter is mounted in an aluminium box 10 x 7½ x 6½. The two variable condensers, which are "Polar" .0005 standard receiving condensers, are mounted on the front panel. It is best to remove the front panel and mount these first of all. After fitting these and replacing the front panel, the rear panel should be removed. The anode stopping condenser—a Dubilier 620—should be fitted, and then the baseboard mounting valve-holder, followed by the key filter condenser (Dubilier 2 mfd), and the three terminal saddles (Eddystone). Before the valve holder is mounted, wires should be connected to the filament and anode terminals, and also the r.f. choke should be connected to the anode. After it is mounted the free ends of the leads are joined to their respective terminals. By following this order there will be no need to "fiddle" with wires.

The coil unit consists of a 3-inch length of ribbed ebonite former. The maximum diameter (across the ribbing) is a fraction over two inches, and was supplied by Bulgin.

The coil is wound with 22 s.w.g. enamelled wire. Start ½-in. in, drill two small holes in the ribbing to secure the wire, and wind on 40 turns, the space occupied being about one inch. It can be secured in a similar manner to the start. This constitutes the anode coil, and the aerial coil should be started one inch away, and completed with 25 turns of the same size wire. This will finish up ½-in. from the end of the former leaving room to drill two small holes so that the coil can be mounted on two Eddystone type 1028 insulating pillars.

Lastly the crystal holder should be mounted close to the grid (top cap) of the PX230SW, the aerial-earth terminal saddle fitted, and the wiring can be finished and the back panel bolted back into place after holes have been drilled in it for the various leads to the terminals.

● Tuning and Keying

On switching on with 150 volts h.t. the anode current will be about 40 mils, in a non-oscillating condition, but on rotating the anode tuning condenser these will drop to 10 mils as oscillation commences.

The aerial used was a normal 7 mc. doublet using 75 ohm transmission line. The two ends of this were twisted together and used as a "T" aerial. A 300-mil. flashlamp should be connected in series with the aerial and will light up fairly brightly when the aerial tuning is adjusted. The aerial and anode circuit tuning affect each other so both should be adjusted for maximum output.

Keying is done in the negative h.t. lead, a 50,000 ohm resistor being in circuit across the key so that the valve always oscillates. With this type of oscillator this is important, for if oscillation ceases during "key up" periods, it is likely to start again with a "chirp." Drain with the key up is only a few mils, not enough to worry about.

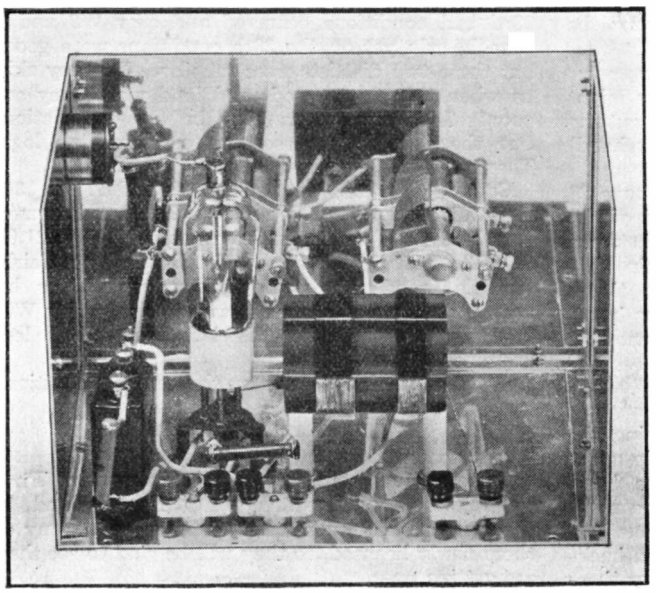
The key thump filter consists of a 2 mfd. condenser with a 200 ohm resistor. This is the minimum filter permissible, and so has been incorporated in the transmitter, but of course the amount of filter will depend upon locality, etc., and in some cases a further 0.1 mfd. directly across the key, with perhaps a small l.f. choke, but individual users can determine the amount necessary by listening on their broadcast set and altering until no sign of key thump is heard.

● Results

The completed set has been in use for a week, and so far G6FO, GW2GV, and GW6YQ, all over 200 miles distant have been worked, so there is plenty of "kick" for working "locals" up to 50 miles or more. With a large 100 ft. aerial and earth or counterpoise results would be far better; here the earth is so bad that it makes no difference to signals! But while most hams have a 7 mc. aerial, a big 100-footer for 1.7 mc. cannot always be erected, so tests have only been carried out using the 7 mc. doublet mentioned.

● Reports

This transmitter will be in use during November at G5GQ, so that the signals may be judged under normal working conditions. The entire transmitter can be built, including drilling and winding coils in well under a couple of hours, so perhaps others will join us. On December 1 the transmitter will be released for THE SHORT-WAVE MAGAZINE loan service, when it is hoped that the 100 kc. check unit, operated with the same crystal, will also be available.



PARTS REQUIRED

1 Aluminium box, 10 x 7½ x 6½ (Paroussi).
2 .0005 variable condensers (Receiving type, Polar).
1 .002 mfd. fixed (anode stop) condenser (Dubilier 620).
1 2-mfd. key filter condenser (Dubilier, paper type).
1 4-pin, baseboard mounting, valve holder (Clix).
1 R.F. choke (Eddystone).
2 Eddystone type 1028 insulating pillars.
3 Eddystone terminal saddles (type 1046).
1 PX230SW valve (Hivac).
1 100 kc.—1775 kc. crystal and holder (Brookes).
1 3-inch length 2-inch ribbed ebonite former (Bulgin).
½-lb. 22 s.w.g. enamelled copper wire (Bulgin).

LISTENERS' DX CORNER

By The DX-Scribe

OCTOBER, Winter Time, Autumn, Fall, or whatever you like to call it: ten metres reaching new peaks, conditions varying like an English summer, and the dx season has arrived.

Star band of the month has been 28 mc., stations rocking in right through the afternoon and evening. An erratic band, but when it does come through more dx is heard in one day than on any other band in a week. The opening up of this band, coupled with greater interest in this column since it was altered last month, has resulted in so many reports that I had better deal with 28 and 14 mc. reports separately, and leave the general remarks to the end.

● Ten Metres

Opening up the first week of September, North American signals started the ball rolling, few stations outside coming through. The feature this month has been the gradual increase of other continents, particularly South Africa and South America. Asia, so far, has only provided VU2CQ, while J's, VK's, and K6's have been conspicuous by their absence.

Looking through the 28 mc. logs, the most widespread come from BOB EVERARD, reporting all W districts, all VE except 5, ZE, ZS, VU, LU, HI, VP, K4, and CN; and L. LEVITT, logging all W, K4, ZU, ZT, TI, HI, and XE.

Both logs are well worth examining because the first was using a super, and the second a single valve. Unless a pre-selector stage is used the super has few advantages over the straight set on "ten," so if your super doesn't get down there, don't be afraid of using a small set for the band, you'll be pleased with the results.

I often wonder if British set designers ever try using them. They ought to, and then they might find out the comic designs they turn out (cutting the pre--selector out on the highest frequency band) —about as modern as solid tyres!

BOB EVERARD scores because he listens above 28 mc. Stations are crowded together this end of the band but some of the best dx is to be heard between 29 and 30 mc. ZE stations even complain that Europeans do not listen high enough for them. Bob's log of police and experimental stations heard above 30 mc. proves this point, the effectiveness of intelligent listening.

● Twenty Metres

Twenty is running to schedule and playing the tricks expected. August-September is usually good, but soon after the Autumnal Equinox the band alternates from very good to very bad. One night stations are overloading the speaker, conditions best ever heard: next night not a sound, not even background noise! Since the beginning of October these conditions have prevailed in the evenings, although the band is alive with VK's and ZL's from 7 a.m. till mid-day.

The forecast last month for more VK's has come off, most logs showing an increase. KA's have generally faded out (they seem to peak during August and then fade out late September), W6 and 7 are not so frequent, though K6 has been surprisingly good. Not many J's use 'phone, but plenty are coming through on c.w.

● Erratic Conditions

Variable conditions are noted by J. P. CUMMINGS, who sends the best ten-metre analysis of the month. His observations over ten days (Sept. 20-29) are:

20th.—14.30-15.30 G.M.T. All W's except 7 and 8.
21st.—14.00-18.00 G.M.T. Conditions seemed good but not many stations active. W6 and 7 missing.
22nd.—15.00-20.00 G.M.T. Very good conditions, all W's and a K4.
23rd.—Conditions poor, only W2 and 8 heard. Band dead.
25th.—15.00-18.00 G.M.T. Conditions better, W1, 2, 3, 4, 8, 9, and a VE4.
26th.—The band opened early, and conditions were the best experienced. Only W5 missing, but VU2CQ and a VE3 heard.
27th.—14.00-17.00 G.M.T. Conditions fair, no W5, 6, and 7.
28th.—All W's except 2 and 8. VE2 heard.
29th.—All W districts.

The striking feature of this report is that on the 23rd bad conditions occurred and only W2 and 8 were heard: yet on the 28th conditions were good, but these two districts were missing. Do they skip us when things are good, and land when they are poor? Local conditions may be the explanation, but the data is here so you can compare logs. Thanks, J.P.C., for the interesting dope.

Commenting on the period Sept. 17 to 30, J. M. R. STUDHOLME remarks: "The band seemed very lively. W's came in from about 13.00 to 21.00 G.M.T. on the best days. Conditions were fairly variable, good days being followed sometimes by very poor days. The band was dominated by W1, 2, 3, and 4, the other districts being much less prominent."

And that, I think, sums up the general conditions on 28 mc. for the month.

● General News

Quite a lot of interesting letters this month. First we welcome JACK LUNN, Dunedin, New Zealand, to the corner. He sends a list of G's heard, many of them newly licensed, so they will be glad to see they are getting over.

He uses an 0-v-1, with 45 volts h.t. Looking at the photo of his shack he has got cards enough to make many of us envious. Thanks very much for the photo and dope, Jack, and let's hope you will be a regular member of the "Corner."

HAROLD TAYLOR says that he heard what he believes was the first 'phone contact between K7 and G. The station was K7FBE, who was working G2PU at 8.05 a.m. on Sept. 14. K7FBE said that he thought it to be the first K7-G contact, and that he had only heard G2PU and G5ML, but a few minutes later he was heard calling G5RV. Somehow I think 7FBE is mistaken because I seem to remember a K7 working a number of G's a couple of years ago.

Another old friend, W. E. DAVEY, writes that he is QRT until December 10, as he has returned to Trinity, and as he will not be writing again before Christmas, wishes the gang a Happy Christmas. He has been busy swotting Morse, and the first call he read was J2CC! Pretty good.

He says: "Re the unusual reception reported by 2COD (October S.-W.M.), on looking through my log I find: April 5, 23.25 G.M.T., VS2AK, R8 calling G5VM. At the same time CE3DW, PY2ER, LU7AC, PY2AC, YV5AE, 5ABE, were coming in with Yanks poor.

June 18, 22.15 G.M.T., VS2AK R7-8 (at 16.45 2AK and PK1MX were only R5-6). Other stations were CX1AA, 2AK, YV5ABE, LU5AN, and PY2FF —good, also some weak W1's, 2, 3, and 4.

2COD heard PK1MX apparently when East Coast W's were coming through. Perhaps he would look up his log and let me know if S. America was coming in well too. I was not listening on the 18th Sept. except early in the evening when at 18.35 I heard PK1ZZ calling CQ. Perhaps 2COD and others who keep logs will compare results on the dates mentioned."

Thanks, W.E.D., and I am sure 2COD will look up his log and let you know. He also reports a Labrador station, VE1KK, located at Belle Isle, Labrador. A letter he received states there are only 14 inhabitants on the island, which is more or less a barren rock. There are no mails from October to June, so it's no good sending cards yet!

The transmitter uses an 802 tube on 14,128 kc. and also the call VO3Z when portable in the Strait of Belle Isle. The QRA is: Harry Cox, c/o East Coast Radio, P.O. Box 103, Halifax, Nova Scotia.

Another worthwhile catch, not so far reported, is advised by A.R.R.L. This is a new amateur station at King Island, Alaska, of the Father Hubbard Arctic Expedition. Using the call K7GIJ, frequencies of 1,885, 1,905, and 28,700 kc. for c.w. and 'phone, and 3,650, 7,205, 7,175, and 14,350 for c.w. Reports should be sent via A.R.R.L., and the station is on daily between 2.30 and 10 p.m. P.S.T.

Replying to W. E. Davey's question as to when he sleeps, Bob Everard says he gets quite enough for this time of year! He has just got a card from W9GBQ, making 15 'phone veries from Colorado, which, I imagine is the record for this country.

● Condx—Wx

One of the foremost weather experts in the world has been in touch with me about weather affecting reception. He forecasts that October 26-27, day and night, will be bad, and also October 28-29 night only. The next bad patch will be November 2-3, so look at your logs and see if it comes off.

He is prepared to co-operate in checks on these conditions, so here is a chance for you to help with some work of real scientific value.

The idea is for you to select a station, say W2XAD, and listen each night for a certain period, such as from 8 to 8.30, noting the strength and fading, and any peculiar effects. When the logs are returned, the local weather conditions will be filled in from records, and the total logs on each station will be summarised on a chart which gives the weather over the entire distance. From these it is hoped to be able to obtain sufficient information to forecast good and bad periods of reception, so you will know when to book up for the pictures!

You only need listen to one station, so please think it over and give a hand. It doesn't matter whether its Schenectady, Buenos Aires, Capetown, or Tokio, provided it's a reliable station which doesn't alter power from day to day.

Just drop a line saying the station you will check, together with the time you will listen, and special log sheets will be sent to you.

And now, 73 till next month.

CALLS HEARD

HAROLD TAYLOR, Eardisley, Cefn Glas, Penyfai, Bridgend, Glam. August 25 to September 21.

14 megacycles.

W5 AFU, AKZ, BEE, BJO, BEK, CJB, DEW, DUK, EHM, ERL, FKG, GIB, JC, YJ, ZS. W6 AL, AM, BAW, BDA, BFC, BJB, CNE, CUU, EFB, EJC, FTU, GCT, ISH, JKR, LUS, LYM, LWL, MLG, MNI, NR, NNR, NTQ, NTX, OAJ. W7 FI, FQK, VA. W9 GFQ, WAJ.

VK2 ADE, OJ, RJ, TI, VV, XC, XU. VK3 AL, KX, PE, MR, WA, ZA, ZL. VK5AW. LU 1HI, 5FG, 7AG, 9BV. TI 1AS, 2OFR, 2RC, K6 MXM, NZQ, OQE. K 7FBE, 4ENY, SA. VE5 JK, OT. HC 1FG, IJB, IJW. PY 1FR, 2BA, 3DP. OA 4AN, 4AI. YV 5AN, 5AM. CO 2LY, 8EC. VS 1AI, 2AK. KA 1HS, 1ME. PK 1MX, 2WL. NY2AE, FB8AH, XE2FC, VP5PZ, CE1AH, HH2B.

28 megacycles.

W 3A1R, AKX, CBT, FVO, GQG, GQK, 4CYU, DRZ, EDD, 6ITH, 8CHQ, DW, EBS, IWG, 9GEG.

JACK LUNN, ZL419, 67, Fox Street, Dunedin, S.I., New Zealand. Two valves, battery.

14 megacycles.

G2 LC, YK, DH, XW. G5 QA, GQ, YV, LI, YU, MO, QY, IU, IV. G6 RO, VP, RB, HB, WY. G8 MW, GB, BD, CV, II.

ZB1H. F3 AU, MN. F8NR, ZD, UK, FG, XN, AI. PA0 QF, AJ, AD, EA. U5RC. OK 1CX, 2PN. OE7JH, OZ3FH, I1MH, LY1S, ON4NW, YM4AD, YR5KW, YR5CF.

W. EDWIN DAVEY, 2, Fingal Street, Woodvale, Belfast, N. Ireland. Rx.: s.h.6.

20-metre 'phone.

CE 1AH, 3CO. ZT2B. ZS5N. XE3MF. PY 1FR, 2FF. FB8AH (near 14,305 kcs.). LU 5CZ, 7AG, 8AB. KA1ME. NY 2AB, 2AE. VS 2AK, 2AO, 1AF. HC 1FG, IJB. VK 2AHT, 2QR, 2RJ, 2VV, 2XU, 3KX, 3ZB, 4VD. PK1ZZ. CO 2HY, 7HF. K4 EJF, 4SA, 6NZQ, 6LTV. W 9APR, 9OJZ, 9UEI (all of Colorado). W5 EBT, BJA, JSY, YJ, ZS. W6 FCU, JKR, NNR, GCT, LLR. W7 APD, FQK, FBE.

20-metre c.w.

J2CC. W6ITY.

BOB EVERARD, Sawbridgeworth. Sept. 15-Oct. 15.

10-metre 'phone.

ZE1JR. ZS6AJ. VU2CQ. LU9FB. H17G. VE4 SN, AW, 3TY, MJ, AIW, ANF. 2KX, ID. K4 SA, EJG, EIL, EPD. VP9R. F8QD. G5KH, 6LL, WU. VE1EA. ZE1JJ, JY. CN8AV.

W1 JZF, AAK, ADM, JNX, ADR, KDC, IAO, KSA, JXV, COO, GDY, AA, HQJ, AXA, WV, KTG, KJJ, AUC, DQK, KNX, DPJ, CHG, DLJ, DRL, EIW, CCZ, IYT, IYU, ER. W2 JSJ, ADI, HEM, KHR, COI, DYR, JCY, FGV, HEJ, JAB, FWK, AMF, AMJ, INX, IXY, JZO, JQJ, HFS, FEZ, TP. W3 GVZ, FVO, GSV, GIZ, CBT, GQK, FUI, GHS, FGW, FAR, ANH, CRY, FSL, AKE, AKX, AUC, PC, BZJ. W4 GB, PD, AHH, DRZ, CYU, BYR, EDD, BYY, EBM, EC, EVV, EHH, EPA, ECF, FT, EJQ, EKI, DXM, DDT, FQ, AII, ETF, ENQ, CYP, AH, ETF, ENQ, CYP.

W5 FPC, ZA, GGX, GHW, BXC, FDE, BRQ, DUQ, EHM, GKZ, ECT, DUK, EB, CCU, FZY, EME, FOE, FOD, FVT, AXA, ZZF, FAO, CYS, EGU, CUA, GNY, BIN. W6 NSM, LFU, ERT, CKR, AM, PBD, NLS, KMI, JJC, GCX, MDN, OSH, MIV, MWK, OKQ. W7 CPY, EMP, ESK, EKA. W8 KYY, NSO, QKI, BTO, LWA, DKX, DST, EBS, IWG, NK, NYU, LSI, JAH, CHQ, KFC, MDH, JRL, ANO, CUY, ISC, HSP, AU, CJM, MWI. CLS, QIN, AVB, CI, NYD, QMU, JFC, LHM, QUL, KUI, GRX, LGO, HEQ, QFI, NKY, KPH, OON, LIY. W9 ZOR, DRQ, VKZ, LUV, OSL, FAA, DXP, BMX, UOV, LQT, BBR, PYK, RBI, OXD, TIO, AGO, BHT, GES, TTB, DTB, TFV, CLQ, GEG, CVN, PZI, LQ, IJX, PHD, YLV, DKU, HDZ, RRX, SRS, WMD, VJO, PTC, EYM, UDO, ULJ.

20-metre 'phone.

K6 NZQ, BNR, BAZ, OQE, MTP, NTV. FB8AH. K7FBE. ES5D. ZB1L. VK2 XU, TR, AP, QR, BW, VV, HF, AZ, NY, ADE, XS, YL. VK3 LU, KX, WA, AL, ZB, XJ, MR, HG, ZL, 4JU, 5AW. YV5 AA, AK. VE4 HU, FI, AW. VS1 AF, AI, 2AO, AK. PK1 MF, MX, ZZ, 4DC. VE5 JK, OT, EF, JB. HC1 FG, JB. HK1EP. PY5 AQ, 8AD, 2BA.

ZU 6N, Q. ZT2B. XE1 GK, Y, 2AH, N, 3AR. LU 1HI, 3EJ, 5CZ, 9BV, MAG. VP6TR. CO 8AK, 7VP, 8VZ. NY2AE. TI2 AV, KP, FG. W5 ASG, FKG, AKZ, YJ, ERL, EZH, DUO, JC, EHM, AMX. W6 BKY, AL, ISH, ITH, EQC, NNR, EJC, JPW, MYO, BIC, BFC, BAW, MBE, NTX, JXI, BJB, AM, HOW, OAJ, FTU, GCT, DEP, CUU, MWD, ODL, ERT, ANU, MMW, MLG, CQI, FFN, EIP. W7 FQK, DVY.

9-10 m. Police 'Phones and Experimental Stations.

W1 XDT (Hartford Police), XHC, XHN, XHD 2XFA, XES, XEM, XIJ, XLD, 3XAR, XEY, 4XCE, 8XKD, XLU, XBE, 9XEH, XPD.

G. W. BARRON, 39, Birley Road, Whetstone, W.10. Three months. Commercial 4-valve s.h.

VK2 XU, HF, ABD, QK, NY, XS, VB, CE, RJ, IQ, LR, VV, ADE, QR. VK3 PE, XA, AL, WA, XJ, MR, ZL, LA, KX, AZ, PL, HG, DZ, ZZ, CVE. VK4 WU, BG. VK5 AW, TR. VE5 OT, JK. K6 NZQ, OQE. W5 NBN, CYU, BZM, ZS, BQ, FDI, CYC, DEW, DBM, FBI, YJ, DVM, BJO, GIB, ABW, EHM, FMA, DND, GMY, CJB, AKZ, ECL, JC, FHJ, YE. W6 AL, GQT, DEQ, AF, FGU, GCT, DOQ, BKV, NNR, GCQ, LLQ, CNE, AH, LYM, EJC, NPX, MLK, FF, ITH, ISH, EFC, CQI, BAW, AM, BFC. W7 QS, FTH, BPL, FPK, QUI, FQK,

CE1AA. HI7G. HC1FG. LU9BV. LU5AG. CE1AO. HK2JA. CX2AY. YV5ABF. K4ENY. VP6TR. HH2B. HH5PA. CO6OM. NY2AE. TI2FG. CO8EC. VS2AK. YI2PA. XE1GK. XE1OK. XG3BY. K7FBE. KA1ME. PY5AQ. LU4KA. OA4AL. LU1HI. VP3BG. YV5AK. VP5PZ, OP. K4DDH, SA. CO2RH. U3BX. OQ5AA. LU5CZ. HC1JB. JW. PY2LM.

2BVN, Romford, Essex. Rx: 0-v-pen, battery, inverted-L, 30 ft. high, 60 ft. long, pointing S.W.

20-metre 'phone stations.

LU1SR. YV5ADQ. FB8AH. VK2 VQ, OC. W10XDA. W7DX.

10-metre 'phone stations.

W2JQX. W8HV. W3 CP, HS.

J. P. CUMMINGS, 47, Burton Road, Withington, Manchester. September 20-30.

10-metre 'phone.

W1 ADM, CCZ, AAK, KTC, HUJ, CAO, HUS, INB, ADR, JNX, IAO, KGG, FLJ, FLZ, WR, JRZ, COO, JAX, AJB, AA, WV, JPM, HAQ, AUC, EZW, HUS, CLR, CAA, HHV, IYT, IYW, ICP, IAR, DBE, CLO, J2F, CQK, IAS, CC, DQK. W2 FWK, JCY, FGL, JQ, PCG, FBO, FGV, FQF, KJY, GZS, HFM, KHR, FBZ, ACY, JQX, HFS, FEZ, AMJ, VRE, JIT, BHD, AOG, EUI, ADI, ISY, JIL, INX, JXF, EWK, JAB, KR, BQB, DHY, HEM, AEF. W3 AKX, GI, BYF, GSV, CDT, ENX, FGW, FVO, GZN, GHS, BGR, CBT, GQS, HI, DMR, THS, GVD, QQK, FPU, ANH, GQT, CWG, NCM, GQG, GVZ, FVO, CBT, PQS, FAR, DUK.

W4 CYU, DRZ, EWD, AHH, EF, BYY, EEV, EJQ, ENQ, AUU, EDD. W5 VA, GMY, EHM, ZVM, VKZ, GGX, ECT. W6 MLS, BK, NLS, MDN. W7 EMP, ASJ. W8 KYY, CFU, IWG, CLS, JFC, EBS, BCO, AVD, HSP, LGO, IGR, QUR, JFG, BTO, QUL, CNA, POT, BLP, KQ, HHZ, QIN, QKI, EUX, DW, NKU, NYD, CJM, NBO, IWA, AHC, OTV, DHM, JOE, ANO, EFS, NK. W9 SQE, TII, FAA, PTC, BBI, IJX, YLV, DTC, OFL, AGO, BCV, BMX, BHT, QH, CVN, JFV, UGR, TTB, BWU, LJU, PZI, IS, WMT, DN, DKU, FLJ, BKU, CJL, LA, JIL, CCI, CVN, DU, FAA. K4EIL. VE2KC. VE3AIW. VE4BD. VU2CQ.

J. M. R. STUDHOLME (BRS1976, BSWL41), London S.W.10 (heard between 17.9.37 and 30.9.37). Superhet, 18 valves. All loudspeaker.

K4EJG, VE2KX, W6 AK, MLS. W5 EHM, CCU. W8 AHC, DJM, EBS, FYD, IWG, JLQ, KYY, LGO, NYD, QKI, QUI. W9 AGO, BHT, FAA, IJX, OIX, PZI, TII, TTB.

L. LEVITT, Well Lane, Kippax, Leeds. "S.-W.M," class B 1 valve). Aerial: 60 ft., N/S.

14-megacycle 'phone.

W5 AIJ, AX, AM, JC, DAN, BEK, ZS, GHW, FCR, ZA, FHJ. W6 BKY, BFC, ITH, DEP, CUU, NNR, AIQ, CRU, CQI, MYO, NIM, KUW, AL, FTU, FGU, JKR, NMI, DXL. VE5 VO, KI, AM, AP, 4AFB, HU, OZ, 3PO, ST, XQ, SM, MD, AFG. VK2 UC, HS, HF, MH, AZ, VV, XU, AX, AV, NI, 3AL, KX, IW, QK, XJ, ZZ, KI, AR, PE, MX, ZL, 4JU, HM, ABD, 5TR, 6MW. VO 6R, 4Y, Z, 2Z. CO2 HY, OK, EG, WP, 6OW, 7VP, CX, 8LG. LU 3AP, 4BI, EL, AA, 5AN, 7AG, AC, 8AB, 9BV. PY 3DP, 6AP, 2BA, 1FR, MK. XE2 LK, IY, 2FC, BJ. OA4 AL, AB. VP 2DG, 5PZ, 6YB. K6 BAZ, MGQ, NZQ, BMC, OQE. K4SA. TI2 AV, IC, RC, KP. CE3 CO, AW. CX2AY. HI7G. HC1FG. PK1ZZ. KA1YM. FB8AH. YI2BA. VU2BG.

28-megacycle 'phone.

W5 EMG, GGX, AHJ, GAR, ZA, DFS, FCR, FZU. W6 FZO, GHD, MFQ. 7GEE. ZU6P. K4EJU. D4QNM. ZT3BG. XE1AG. TI2FG. HI7G. OK3VA.

K. R. HAYCOCK, Birmingham.

VE5OO. PY 2FF, 5AQ. K4SA. HI 5X, 7G. YV5 ABE, AA. LU1EX. CO6OM. 10 m.— W2 DH7, ADI.

CLUB ACTIVITIES

Reports for inclusion under this head must reach us by the 15th.

BATTERSEA.

The Battersea and District Radio Society announce they have commenced their winter session and meet on Tuesday and Friday of each week at the Battersea Men's (L.C.C.) Institute, Latchmere Road, S.W.1. Talks on the every-day problems of the wireless enthusiast will be given. Practical work and a Morse instruction class for those desirous of acquiring a knowledge of the code are a feature. This Society has recently completed the construction of a broadcast receiver for the Institute Common Room and hope shortly to commence work on a new short-wave receiver for use in the club room. Arrangements are in hand for visits to places of interest and new members will be welcomed. The subscription of 1s. 3d. for three months also admits to all other facilities of the Institute. Particulars available from Mr. S. H. HARRIS (G5SH), at the above address.

BIDEFORD

Since its annual general meeting the Bideford and District Short-Wave Society has begun its new session at Mignonette Walk, Bideford, with a completely reorganised committee. A more vigorous programme is scheduled which includes: Installation of transmitter, Morse classes, practical talks and demonstrations, and general construction.

The secretary, Mr. W. G. COUCH, of "Hillside," Glen Gardens, Bideford, would be most pleased to hear from prospective members in this district, and writes: "We have been most fortunate in acceptance as our first president, Mr. A. E. Forsyth (G6FO), also in obtaining the services of Mr. W. Chubb (late Merchant Service) and Mr. J. Caldwell (G8US) as Morse instructors"

BLACKPOOL

Blackpool and Fylde Short-Wave Radio Society notes record membership increase but more enquiries are welcome. While somewhat unsatisfactory from the technical viewpoint the recent direction-finding field day was enjoyed by all; a similar event for 1.7 mc. is planned. Junk sales are again arranged and G5MS and G6VQ have evolved a scheme, secret at the moment, for members to increase their technical knowledge.

"S.-W.M." class B receiver test.

Taking advantage of THE SHORT-WAVE MAGAZINE offer of loan of the class B receiver we now publish the Blackpool Society's report.

3.5 mc. Very good for c.w. but insufficient gain unless used with at least 60 feet of aerial. The set was used with entire satisfaction for R.N.W.A.R. c.w. work.

6 mc. broadcasting. Good, but conditions poor during all tests.

7 mc. Fone and c.w. signals equal to a good s.g.-detector-pentode ham-band type receiver. Reaction is very good, the set being used for break-in quite satisfactorily. 35, 50 and 84 feet aerials were used. Reports all agree.

10 mc. Good; plenty of volume on speaker from Zeesen, etc.

12 mc. As 10 mc.

14 mc. C.W. good and reaction stable for amateur use. Telephony, however, was not so good as the det.-l.f. set used as a check.

15 mc. broadcast. Quite good, plenty of sensitivity but lack of volume; as 14 mc.

19 mc. W2XE very good, using 84 feet aerial; with the smaller aerial volume was appreciably down.

28 mc. Considerable difficulty was experienced in getting the set to oscillate with the 84 feet aerial and the only stations heard were harmonics of local 14 mc. stations, but times of operation were not very good for 28 mc. listening.

The set is a neat and compact one and very useful for portable work, also d.f. The h.t. (120-150) is higher than usual, but this is not a great difficulty. The band-setting device was unpopular as the three amateur bands had to be received in two steps. The use of four-pin coils was a much debated point and the majority verdict (14-10) was that a separate aerial winding is an advantage.

The general opinion, the result of testing on all bands at three locations was: "Very useful receiver for the beginner to c.w. and as a stand-by set for the advanced ham and s.w.l." .

Secretary: H. FENTON, 25, Abbey Road, Blackpool, S.S., Lancs.

BRADFORD

At the annual general meeting of the Bradford Short-Wave Club, held at the club headquarters at Bradford Moor Council Schools on Friday, October 1, the following officials were elected for the season 1937-8. Hon. secretary, Mr. S. FISCHER (2BMO), "Edenbank," 10, Highfield Avenue, Idle, Bradford; hon. treasurer, Mr. V. W. Sowen (2BYC); committee, Mr. E. M. Varley, Mr. G. Walker (2AWR), Mr. E. J. Simonard (2CQY). Mr. Simonard was elected chairman of the committee.

Two November events are: 12th, a social evening; arrangements are being made to entertain a number of friends from Leeds, with a view to making the social a full-blown "hamfest." The following Friday, 19th, a demonstration by Messrs. Lissen is scheduled.

EXETER

An interesting series of meetings have been held by the Exeter and District Wireless Society during the past month. An amplifier for the Society's own use is being built by the members and the parts used will be subscribed for by them. After much discussion it was decided that an amplifier giving an undistorted output of 10 to 15 watts was necessary and is being obtained by using two MHL4's and a final stage of two PX25's in push pull. The amplifier will be ready for test by the middle of November and a set of frequency test records is being obtained.

At the meeting held on October 4 a lecture and demonstration was given by Mr. Cholot of Messrs. Lissen Limited. The lecturer described in detail the manufacture of the new Lissen short-wave components and demonstrated both their commercial receivers and short-wave sets which can be made by the amateur. The talk was made more interesting by the exhibition of various components and the clear technical description as to method of manufacture and the fine limits employed in production.

Members were given a lecture and demonstration at the Devon and Exeter Hospital on high frequency apparatus and X-ray work on the 11th. X-ray

tubes, ultra violet ray, and portable X-ray apparatus, which was shock proof, was shown by Dr. Wroth, who also touched upon the subject of therapy during his lecture. The members were especially interested in the high tension supply of 2,000 volts, and the screening of a member's heart, and other portions of his anatomy. Radium needles were also exhibited.

On October 18 Mr. F. J. Thorn demonstrated a full range of 1938 commercial sets, ranging in price from £5 to £100. This demonstration was eagerly awaited as it gave a quiet opportunity of testing various makes one against the other. Meetings each Monday at No. 3, Dix's Field, Exeter. Secretary: Mr. W. CHING, 9, Sivell Place, Heavitree, Exeter.

KETTERING

The Kettering Radio and Physical Society has commenced its winter programme and welcome all interested in radio or photography to their meetings. The fifth annual Kettering radio exhibition was held recently and again proved a great success, the society's stand being a mecca for amateur radio enthusiasts, as a good display of receivers and transmitters was staged. A short-wave section has been formed, and a Morse class started, and it is hoped to commence transmitting again under the society's call sign, G5KN. Secretary/treasurer: IRVING L. HOLMES, "Miami," The Close, Headlands, Kettering.

SOUTHALL

On October 5, the President, Mr. Douglas Walters, presented the magnificent silver d.f. trophy to Mr. L. J. Swan of the Southall Society. Visitors from eight other clubs were present at this pleasant ceremony, which Mr. Swan concluded by filling the trophy with champagne.

October 12.—A debate was held on the subject, "Telephony is more suited for amateur working than c.w." In favour spoke Mr. Douglas Walters (G5CV) and Mr. N. Bevan (G8IH); against, Mr. Jack Maling (G5JL) and Mr. H. C. Spencer (G6NA). The result was a victory for the 'phone merchants by 27 to 22. It was announced that a former President, Mr. W. Ancrum, had presented a cup to the Society and that this would be awarded to the member who was judged to have done the most valuable research work during the year.

Southall are to be complimented on producing a programme brochure in which a really welcome message is given to prospective members; a copy may be had on application to the Hon. Secretary: Mr. H. F. REEVE, 26, Green Drive, Southall. Meetings every Tuesday at 8.15 in Southall Library, Osterley Park Road.

TOTTENHAM

Three Visitors' Evenings, on the 11th, 12th, and 13th of November, from 7.30 until 10 will be held by Tottenham S.-W. Club. All radio enthusiasts are invited to the club's shack on these dates. Members' apparatus made on the club's premises will be on view. Complimentary tickets will be gladly forwarded on receipt of a postcard to the Hon. Secretary: EDWIN JONES, 60, Walmer Terrace, Palmers Green, N.13.

WELLINGBOROUGH

The new season's opening gathering of the Wellingborough and District Radio and Television Society took place at The Exchange Hotel, Wellingborough, on October 13, when a lecture was given by the Hon. Secretary, Mr. L. F. PARKER (G5LP) entitled, "Short-Wave Radio and the Amateur Bands."

Commencing with the 180-metre band, Mr. Parker said this was the most neglected and some effort would have to be made to prove occupancy or it would follow the usual precedent and be confiscated for other services. This would be unfortunate for amateur radio, the 180-metre band had distinct advantages over other bands in that local contacts between amateurs could be carried on without undue interference, as was experienced on the higher frequencies. One of the amusing things often heard on this band was the cross-talk between trawlers returning to port and the lurid terms in which some described their catch, or the lack of it: this was often of great surprise to listeners who accidently stumbled across these shifting transmissions. The Scotland Yard transmissions could also be heard there at times, but conditions of the receiving licence forbade description.

In describing conditions on the popular forty-metre band, Mr. Parker said that as a whole, the standard of operating and the quality of some transmissions was deplorably low and was bringing the amateur fraternity into bad repute. He appealed for beginners to commence transmissions on the 180-metre band instead of adding to the welter of interference already experienced on forty metres, and went on to criticise the prevailing craze for high power that was largely the cause of the intolerable conditions. This craze was a vicious circle that could only be broken by stern measures by the powers that be, and until some reduction in power could be enforced conditions were not likely to improve. The speaker gave instances where English amateur stations using about 100 watts of heavily modulated telephony had carried out long contacts with stations less than 100 miles away, whereas the same contact could have been made with inputs below 25 watts.

The next band dealt with was the twenty-metre, and which, from a listener's point of view, was the most popular on account of the amount of long-distance telephony that could be heard there. When conditions were good, said Mr. Parker, transmissions from all over the world could be easily heard; he instanced the large number of American transmissions which occupied a position in the centre of this band and which could be heard on almost any evening during the summer at better strength than some of the broadcast stations. The rapid development of the ten-metre band was described, and after the lecture questions and discussions were dealt with.

THE WORLD FRIENDSHIP SOCIETY OF RADIO AMATEURS (U.S.A.)

G6AQ, hon. secretary of the British Section of the above society, will be grateful to any "hams" who answer the following special appeal. An invalid friend who is quite unable to work consequent on a serious operation, and whose funds have been sadly depleted by reason of his illness, is desirous of building a c.w. receiver to relieve the monotony and help him bear the pain. Please look over your spare gear, o.m., and send anything useful to Allen Eaton, Terrace Road, Tideswell, near Buxton, Derby. Thank you.

QUERY COUPON	
S.-W.M.	11/37.

Station	Dial	Call	Wave	Freq.
PITTSBURGH		W8XK	13.93	21.54
DAVENTRY		GSJ	13.93	21.53
WAYNE		W2XE	13.94	21.52
DAVENTRY		GSH	13.97	21.47
BANGKOK		HS8PJ	15.77	19.02
DAVENTRY		GSG	16.86	17.79
BOUNDBROOK		W3XAL	16.87	17.78
HUIZEN		PHI	16.88	17.77
ZEESEN		DJE	16.89	17.76
WAYNE		W2XE	16.89	17.76
BUDAPEST		HAS3	19.52	15.37
ZEESEN		DJT	19.53	15.36
ZEESEN		DJR	19.56	15.34
SCHENECTADY		W2XAD	19.57	15.33
DAVENTRY		GSP	19.60	15.31
BUENOS AIRES		LRU	19.62	15.29
ZEESEN		DJQ	19.63	15.28
WAYNE		W2XE	19.65	15.27
DAVENTRY		GSI	19.66	15.26
BOSTON		W1XAL	19.67	15.26
RADIO COLONIAL		TPA2	19.68	15.24
PODEBRADY		OLR5A	19.71	15.23
EINDHOVEN		PCJ	19.71	15.22
PITTSBURGH		W8XK	19.72	15.21
ZEESEN		DJB	19.74	15.20
HONG KONG		ZBW4	19.75	15.19
DAVENTRY		GSO	19.76	15.18
TOKIO		IZK	19.80	15.16
SOURABAYA		YDC	19.80	15.15
DAVENTRY		GSF	19.82	15.14
VATICAN CITY		HVJ	19.84	15.12
ZEESEN		DJL	19.85	15.11
SOFIA		LZA	20.24	14.88
WARSAW		SPW	22.00	13.63
SANTIAGO (Chile)		CB615	24.39	12.30
REYKJAVIK		TFJ	24 52	12.23
MOSCOW		RV59	25.00	12.00
RADIO COLONIAL		TPA3	25.23	11.88
PITTSBURGH		W8XK	25.27	11.87
LISBON		CSW	25.34	11.84
PODEBRADY		OLR4A	25.34	11.84
WAYNE		W2XE	25.36	11.83
LISBON		CT1AA	25.36	11.83
ROME		I2RO4	25.40	11.81
TOKIO		JZJ	25.42	11.80
VIENNA		OER2	25.42	11.80
BOSTON		W1XAL	25.45	11.79
ZEESEN		DJD	25.49	11.77
DAVENTRY		GSD	25.53	11.75
HUIZEN		PHI	25.57	11.74
WINNIPEG		CJRX	25.60	11.72
RADIO COLONIAL		TPA4	25.60	11.72
HAVANA		COCX	26.24	11.43
RADIO NATIONS		HBO	26.31	11.40
BUENOS AIRES		LSX	28.99	10.35
RUYSSELEDE		ORK	29.04	10.33
LISBON		CSW	27.17	11.04
MADRID		EAQ	30.43	9.86
HAVANA		COCQ	30.77	9.75
LISBON		CT1CT	31.00	9.68
BUENOS AIRES		LRX	31.06	9.66
LISBON		CT1AA	31.09	9.65
CARTAGENA		HJ1ABP	31.25	9.62
CARACAS		YV5RA	31.25	9.60
MOSCOW		RV96	31.25	9.60
RADIO NATIONS		HBL	31.27	9.59
PHILADELPHIA		W3XAU	31.28	9.59
SYDNEY		VK2ME	31.28	9.59
EINDHOVEN		PCJ	31.28	9.59
DAVENTRY		GSC	31.32	9.58
LYNDHURST		VK3LR	31.32	9.58
MILLIS		W1XK	31.35	9.57
BOMBAY		VUB	31.38	9.56
ZEESEN		DJA	31.38	9.56
PODEBRADY		OLR3A	31.41	9.55
SUVA (Fiji)		VPD2	31.46	9.54
ZEESEN		DJN	31.45	9.54
JELOY		LKJ1	31.48	9.53
TOKIO		JZI	31.48	9.53
SCHENECTADY		W2XAF	31.48	9.53
HONG KONG		ZBW3	31.49	9.52
MELBOURNE		VK3ME	31.55	9.51
DAVENTRY		GSB	31.55	9.51
CARTAGENA		HJ1ABE	31.58	9.50
RIO DE JANEIRO		PRF5	31.58	9.50
MEXICO CITY		XEWW	31.58	9.50
MADRID		EAR	31.62	9.49
HAVANA		COCH	31.82	9.43
BANGKOK		HS8PJ	31.85	9.35
LIMA		OAX4I	32.12	9.34
BUDAPEST		HAT4	32.88	9.12
RADIO NATIONS		HBP	38.48	7.80
TOKIO		JVP	39.95	7.51
SAN DOMINGO		HIT	45.25	6.63
NANKING		XGOX	43.99	6.82
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MARACAIBO		YV1RH	47.12	6.36
MARACAIBO		YV5RP	47.84	6.27
HAVANA		COKG	48.39	6.20
MARACAIBO		YV5RD	48.78	6.16
WINNIPEG		CJRO	48.78	6.15
PITTSBURGH		W8XK	48.86	6.14
JELOY		LKJ1	48.94	6.13
HAVANA (CUBA)		COCD	48.94	6.13
GEORGETOWN		VP3BG	48.94	6.13
BOGOTA		HJ3ABX	48.96	6.13
MEXICO CITY		XEUZ	49.02	6.12
WAYNE		W2XE	49.02	6.12
CHICAGO		W9XF	49.18	6.10
BOUNDBROOK		W3XAL	49.18	6.10
BELGRADE		YUA	49.18	6.10
TORONTO		CRCX	49.26	6.09
HONG KONG		ZBW2	49.26	6.09
NAIROBI		VQ7LO	49.32	6.08
CHICAGO		W9XAA	49.34	6.08
LIMA		OAX4Z	49.33	6.08
GEORGETOWN		VP3MR	49.42	6.07
MARACAIBO		YV1RD	49.42	6.07
PHILADELPHIA		W3XAU	49.50	6.06
CINCINNATI		W8XAL	49.50	6.06
COPENHAGEN		OXY	49.50	6.06
MOTALA		SBG	49.50	6.06
BOGOTA		HJ3ABD	49.59	6.05
BOSTON		W1XAL	49.67	6.04
PANAMA CITY		HP5B	49.75	6.03
ZEESEN		DJC	49.83	6.02
BOGOTA		HJ3ABH	49.85	6.01
HAVANA		COCO	49.85	6.01
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MONTREAL		CFCX	49.96	6.00
MEXICO CITY		XEBT	50.00	6.00
MOSCOW		RW59	50.00	6.00
VATICAN CITY		HVJ	50.26	5.97
MARACAIBO		YV1RB	51.28	5.85
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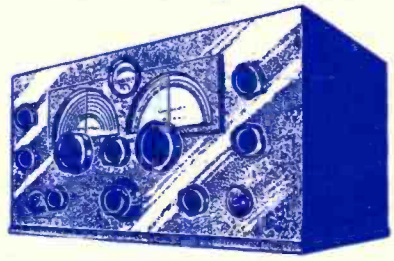

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