The SHORT WAVE Magazine

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EXCLUSIVELY FOR THE SHORT WAVE LISTENER EXPERIMENTER AND TRANSMITTING AMATEUR

VOL. IV No. 8 OCTOBER 1946

SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR AND AMATEUR RADIO

Vol. IV. OCTOBER 1946 No. 8

CONTENTS

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EDITORIAL

UHF

The post-war amateur frequency allocations in many countries already include generous slices of territory above 100 mc. The G's are almost unique in not yet possessing such facilities.

It is not our intention here to raise a complaint in the matter, since grants in the UHF region are in the offing, but rather to draw attention to the value of such bands when we get them. Though we had allocations in the 120 and 240 mc bands before the war, very little practical use was made of them.

Such frequencies will give many amateurs fresh scope for ingenuity and experiment, and will pose new problems in amateur communication—the fundamentals upon which the art of Amateur Radio is based. The Americans, Australians and some Europeans have already gone far in investigating the 144, 166 and 420 mc regions, so that the technique is already fairly well established.

But in this country it will open a new field for useful and interesting work, and we look forward to the first grant of UHF facilities to holders of G callsigns. During the war, British radio technicians made a large contribution to progress in communication (as distinct from radar) technique at these frequencies, and many pre-war amateurs were prominently identified with the work.

In case it should be supposed that such frequencies have little practical value for amateur communication, some post-war results are worth mentioning: The American point-to-point record on 144 mc is 310 miles, and the Australians are working regularly over distances up to 70 and 100 miles on 166 mc.

These results compare well with that we in this country are doing on the 58 mc band.

Austin Forsyth G6FO.

Five Metres

Events of August 22—European Notes —First Contacts—G Activity—Proposed Five-Metre Contest

By **A. J. DEVON**

YOUR earnest contributor practically never fails to get a last-minute jolt, in the shape of a new DX report (usually from the indomitable G5BY!) just as these notes have been passed in proof. This is being written on September 20, while we are going through a period of ionospheric disturbance, and it may well be that the week-end will see another change in conditions. Anyway, by ruthless cutting we can usually squeeze in a "flash" panel, so always let us know what is happening, even if you think we are at press.

Generally, this has been a quiet month, with the band open for Europeans on August 21 (2030-2300), August 22 (1400-2330), August 25 (1710-1735) and September 8 (1440-1530) only. During all periods except that of August 22, there was insufficient activity to take full advantage of conditions—indeed, the times were a little awkward for most people.

As summarised very briefly in the stop-press panel in the September issue of the *Magazine*, August 22 was what the HB's have called "ein grosser Tag."

The Results

Several G's had a share of the DX and we also have interesting reports from Europe, where there is more activity on 58 mc than might be supposed. The achievements so far verified are as follows :

HB9CD worked G2BMZ, G5BY, G6LK, and G8JV.
HB9BZ worked G2BMZ and G5BY.
HB9J worked G5BY, having first heard G8YV(?) and G6LK.
G5BY worked F8RSN, HB's as above, and I's 1FA, 1IRA, 1KS, 1MH, and 1TH.
G2MR heard OK2MV.
OK2MV heard G5AM(?) and several unidentifiable G *'phones!*
OK2UA received G5MA and G5TX, and also heard the latter call OK2MV.
An OK listener in Southern Bohemia logged G5MA and G5TX.

All this happened over the period 1945-2230 BST when, as G5BY remarks, the band was full of S9 signals for a whole hour ! For those who were in on it, the problem was largely one of good operating in order to knock off as many DX stations as possible while the going was good.

Conditions

Conditions were most peculiar, in that both G5BY and HB9CD report that beam directivities were all wrong for part of the time at least. At one period, G5BY had to shoot the 8-element E.N.E. to get the best signal from Italy! The ionised cloud was obviously well off the direct line and was probably putting down signals in all sorts of localities and to many directions from which we have not yet heard. In view of the foregoing, the silence from SM is surprising.

HB9CD remarks that on similar occasions his rotary has given him DX reception "all round the clock," in every direction but the right one. This is in accord with W1HDQ's observations in the States, noted here in July, when signals seemed simply to be "raining down from overhead." The reasons for this phenomenon are

obvious and fit in exactly with one's mental picture of the behaviour of the reflecting layers when ionisation is intense at low levels.

The "off-the-line" effect is well known, and was first mentioned in this feature in February, 1939—history keeps repeating itself.

The paragraphs above summarise the happenings of August 22 which, after all, was a good day mainly because the ionosphere "gave" during a period when there is normally a relatively high degree of activity on 58 mc. We are now getting round to that state of affairs where the band is populated at the *right distances* for advantage to be taken of such conditions. We used to talk hopefully before the war in this column of contacts such as those of August 22, saying that if the stations were on at the right time and distance, the contacts would happen, just as they have done for so long in the States.

OK1AW, Mestec, in action. *The small job is a 58 mc transceiver and behind is the 28 mc PA.*

First Contacts

For the record, we have been researching into the question of first contacts on five, which are given in the panel appearing herewith. They have all been independently confirmed and to the best of our knowledge and belief are an accurate statement of the facts.

France, you will notice, is not mentioned. The reason is that though our records of these matters, both before and after the war, are quite comprehensive, and we know all about the post-war F QSO's, we have it in mind that there *was* a pre-war G/F contact which, for some reason, was not noted in this column. Can anyone shed any light? And have we missed any others? It must be a two-way QSO, of course, with full exchange of reports. We have plenty of evidence of pre-war one-way *reception* of G/HB, SM/G, G/F and ON/G.

FIVE-METRE FIRSTS

Italy :	G5MQ/I1IRA, July 2, 1938.
Holland :	G2AO/PAØPN, August 17, 1939.
North Africa :	G5BY/FA8B, June 24, 1946.
Switzerland :	G5BY/HB9CD, August 22, 1946.

GM Activity

At last, the veil is lifted north of the Border. There are no less than nine stations now active in Scotland, GM's 2KP, 2LQ, 3AKK, 3YS, 5ST, 5VG, 6MS, 8AH and 8CH, most of them in the neighbourhood of Glasgow. Regularly on, every evening between 2100-2200 clock time, are 2KP, 2LQ, 3AKK, 8AH and 8CM, all Glaswegians.

This is good news, as it is in this direction that we expect the new inter-G record to be made—the distance is just right for a good breaking of the one standing. Needless to say, the GM's are complaining of "weak and unidentifiable carriers." Our vocabulary on this topic is exhausted.

G Notes

G2XC has had first contacts with G2AK(115), G51G(105) and G5MQ (190), and reports a solid early-morning run with G6YU (Coventry, 105 miles) during the second fortnight in August. Only one morning missed —August 29, when it was blowing a full gale from the south-west.

G6DH (116) now shows up at G2XC at any time of the day or night (how very like those regular pre-war G5BY-G6FO contacts over 126 miles, that so many people found so hard to believe!).

G2XC does remark that if there is a wet-weather belt between Clacton and Portsmouth, results *are* affected. Once more harking back for a moment, in this respect G5BY-G6FO proved time and again that they could work quite irrespective of weather conditions—good contacts were made with 6-in. of ice on their aerials (winter 1938-39) or in the blazing heat of the following summer.

G6YU (Coventry), though he says has a poor location, is doing very well. His three-element close-spaced rotary is below the level of neighbouring steel-frame factory buildings! Measurements show that it gives him a forward gain of at least 12 dB, with a back-to-front ratio of 2:1. This helps to minimise noise from electrical machinery and *spot-welding* plant within a few *yards* of the aerial. What a happy spot for 5-metre DX!

But it makes G6YU's performance on the band all the more creditable. His Tx is a four-stage capacity-coupled job with HK24's in the final, modulated with a pair of TZ20's in Class-B—but he uses CW mainly, be it noted. The Rx is a National 81X reorganised for 58 mc by the use of an interesting converter design: An RL16 triode as RF amplifier in a "grounded-grid" circuit, with an X61M as frequency-changer to 3·75mc. G6YU, whose log appears in Calls Heard this month, remarks that G5TX and G6VX are the strongest and most consistent semi-DX stations with him.

Shorts

G2XC knocked up 193 contacts in the four weeks ended September 12 . . . New G stations active are G4QL (Horndean, Hants), G2VQ (Hurst Green, Sussex) and G2VH (Southsea) . . . I1KS has a pronounced American accent; it is liable to give nervous 58 mc operators heart-failure when they hear it for the first time! . . . OK1AA, Ing.Mir. Schaferling, Korunni 94, Prague 12, would be very grateful for cards from the G's who have heard his signals. . . . The HA's are getting ready, using some very fine VHF equipment looted from the retreating Hun; they are QRX only at the moment, as amateur transmission is still prohibited . . . OK2DS is active with 50 watts from a good location . . . . If you hear "Test de OK1FF" on an auto-key for long periods, it's all right; he also has 50 watts, from Prague . . . HB9CD advocates FM as a means of overcoming many of the difficulties of 'phone reception on 58 mc; we concur, but not very heartily. Surely CW is the right answer as things are at present; but we agree that amateur FM working will come . . . VK2NO/2ABZ are in *regular* S9 contact over 70 miles on 166 mc! . . . VK2NO, our old friend Don Knock, remarks that the compactness of everything on this band is most intriguing; his 4-element Yagi for 166 mc is as sharp as a needle and

must be right on the distant station. . . . . There are 12 VK's on 166 mc within working distance of one another. . . . . Many others are busy on 50-54 mc looking for DX, which is ZL and W6 for them. . . . . The W's are paralleling all our 58 mc results, but over much greater distances. . . . . WØYUQ of Manhattan, Kansas, is the first to work all American call areas on 50 mc; there are several others with only one contact to get. . . . . What makes it harder is that there are no less than eighteen States in the Union in which no 5-metre activity has ever been reported! . . . . . W7QAP's motto with his 5-metre beam is "When in doubt, aim north"; it seems this always brings back W6's—more of that off-the-line trouble.

Certificate of Merit Awards

The question of awards to certain 58 mc operators of the *Magazine* Certificate of Merit, the institution of which is announced in this issue, is now under discussion with the Editor. We do not at present require recommendations in the 5-metre field as the achievements that will qualify for the award have, in practically every case, already been recorded in this column.

It is hoped to announce the first such awards in the next issue.

Five-Metre Contest

We have in mind the organisation of a 58 mc Contest, worked on the number-exchange procedure, with points allotted on a distance basis, and multipliers for contacts over 100 miles. The period proposed is the fortnight November 23-December 8, results to be announced in the New Year issue of the *Magazine*.

There is a certain amount of doubt in our mind as to how much support such a Contest would receive. In other words, are 5-metre operators interested in an event of this kind? It would certainly help to stimulate interest in 5-metre working. On the other hand, it may be thought that 58 mc, being at present our only band for purely experimental work, should be kept clear of contests.

We ourselves are very keen on the idea; it has been under consideration for the last two or three months as a possible winter activity, and we are quite prepared to run it if only twelve transmitters write to say they like the scheme.

In order to be able to make an announcement in the next issue, with the rules and conditions, we should be glad to have acceptances by October 18—please drop a line as soon as possible.

Reports—November

Closing date for reports for the November issue is October 18 *certain*. In particular, we should like to hear from the North again, with some log-lists for Calls Heard. Write or wire A. J. Devon, c/o *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1. (ABBey 2384.)

999—DIPOLE DIVERSION

One recent afternoon, G3AD and G8ZD were quietly busy putting up a new dipole for the latter on the roof of his house, somewhere in London, S.W.

An anxious neighbour, full of concern for the G3AD household, dialled 999 and reported burglars. A Squad car arrived on the instant and the officers, seeing what was going on, beat on the front door for immediate admission. G3AD's father explained the circumstances, and then added, "Of course, you can take them along if you like"! The desperadoes on the roof remained blissfully ignorant of it all till they came down for tea.

AMATEUR RADIO IN BURMA

From U Hla Oung, XZ2AC, of Rangoon, we have a note that, like the Germans in Europe, the Japanese collected every bit of radio equipment they could find when Burma was over-run. The possession of even broadcast receiving equipment was made the excuse for cruel excesses by the Japanese security police.

Government permission for the re-establishment of amateur stations owned by Burmese nationals having been forthcoming, XZ2AC hopes shortly to be on the air again, perforce starting from scratch in the matter of gear.

Home-Constructed Communications Superhet

Full Spread on all Amateur Bands to 28 mc—Plug-in Coils—Detailed Constructional Data—Alignment Procedure Described

PART I

By **A. B. WRIGHT (G6FW)**

WHILST the TRF receiver can give excellent performance in skilled hands, most amateurs sooner or later reach the stage when its shortcomings become more and more evident. With the advent of higher-powered stations and increasingly crowded occupancy of the amateur bands, the poor selectivity of this type of receiver compels the amateur to consider the purchase or construction of a superheterodyne.

The purpose of this article is to describe the construction of such a receiver, but before discussing the circuit and constructional details, let us consider the further advantages possessed by the superhet.

Advantages of the Superhet

The essential principles of the superheterodyne type of receiver have been discussed in an excellent article by A. A. Mawse in the May issue of the *Magazine*, and whilst there is no point in repeating them here, certain advantages possessed by the superhet over the TRF receiver should be stressed.

First, owing to the fact that the major part of the RF amplification takes place at a comparatively low frequency, sensitivity is far better, and is more nearly constant over the whole waveband. Selectivity is much improved owing to the greater possible efficiency of a series of fixed tuned circuits—that is, the IF circuits—as compared with a tunable system. Dead spots, such as are commonly experienced in a straight Rx without RF amplification, are non-existent in a superhet, and the receiver tuning is completely unaffected by the aerial. This latter fact makes possible easier and, in a well designed set, completely reliable calibration, an important point when working over comparatively narrow bands, such as those allotted to amateurs.

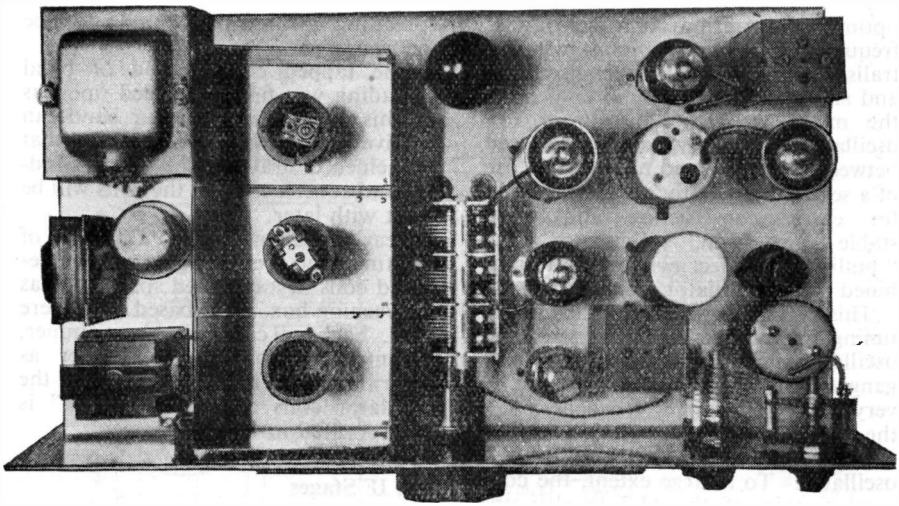
The disturbing effect of reaction on tuning is also avoided, and the veriest beginner can obtain results using a superhet which can only be achieved by the most skilled user of a TRF receiver.

Lastly, automatic volume control can be incorporated in the superhet, which is a decided advantage when listening to 'phone stations whose signal strength is continually varying.

Many amateurs are under the impression that to construct a superhet receiver which will compare in performance with a commercial model is, if not an impossible feat, a task only to be undertaken by those having considerable experience of this type of Rx *plus* a room-full of laboratory equipment.

That this is an erroneous impression is proved by the fact that the receiver to be described was the writer's first effort at superhet construction, and all operations, including ganging and lining-up, were completed with no other aids than a simple oscillator, an Avo-Minor and a pair of headphones.

The set was built during the war years when transmitting activity was out of the question, and when the



Top view of G6FW's receiver, showing placing of components. *Power supply compartment on the left, then coil box, and three-gang band-set condenser in the centre, with RF and IF stages on the right. The small condenser at the extreme right on the panel is the BFO pitch control, and to its left is C7, the oscillator band-spread condenser.*

urge to dabble in radio construction simply had to be satisfied.

Choice of Circuit

The first point to be considered is the choice of a suitable circuit (see Fig. 1), bearing in mind present day limitations in the supply of components.

At least one RF stage was considered an essential, if only to keep second channel images, that bugbear of the cheap superhet and "all-wave" receiver, down to reasonable proportions. It was also hoped that some measure of amplification would be obtained, bearing in mind memories of adding RF stages to the TRF receiver, with an amount of gain commensurate with the expense and trouble involved.

The original set was constructed at first without the RF stage, the latter being added subsequently, and results as regards image rejection and added sensitivity surpassed expectations. Whilst, as would be expected, a single RF stage does not completely eliminate images, these are reduced to manageable proportions. A certain amount of image interference is experienced on the 20-metre band, but was regarded as inevitable in a receiver of this size.

A 6K7 was used in the RF stage, the same valve incidentally being used in the IF stages, mainly because it was an easily obtainable type at the time the receiver was constructed. It is very satisfactory and gives an adequate signal-to-noise ratio, this latter factor governing eventually the effective sensitivity and the degree to which weak DX signals can be copied. The 6K7 also responds very well to AVC.

The provision of an RF volume control was found a necessity in preventing " blocking " of the receiver by powerful signals.

The Mixer/Oscillator

Various arrangements of mixer/oscillator were tried out, including a 6A8G pentagrid, in which the oscillator and converter elements are contained in the same valve, also a 6C6 with separate oscillator.

The 6A8G gave good results on the lower frequency bands, but for

optimum operation on the higher frequencies, a small amount of neutralisation is required between oscillator and signal grids. The final choice for the mixer was a 6L7, with a 6J5 oscillator. Capacity coupling is used between oscillator and mixer. The use of a separate oscillator, besides making for easier construction and more stable operation, eliminates the "pulling-in" effect evident with combined mixer/oscillator valves.

This effect, by which the mixer tuning affects to some extent the oscillator tuning, is usually masked by ganged condenser operation. It can be very serious at higher frequencies, as the stability of the whole receiver depends upon the stability of the RF oscillator. To a large extent, the conversion gain of the 6L7 is also unaffected by variation in oscillator output, and the valve is not at all critical in operation.

Whilst many designers favour a pentode in the RF oscillator position, the 6J5 triode was found to give adequate output for good mixer action in conjunction with the 6L7.

It will be noticed that a separate reaction coil is used in the oscillator stage, instead of the more usual tapped inductance. The use of a separate coil enables adjustments to be made much more easily and quickly than if taps were taken out on the grid coil, as by altering the spacing and the number of turns of the reaction coil, the degree of reaction used can be critically adjusted.

Band-Spread and Coil Arrangements

It will be seen that plug-in coils are used in the receiver. There is a two-fold reason for this. First, it was considered that the difficulties of incorporating an efficient coil-switching arrangement were too great for a first attempt at superhet construction. Secondly, the commercial coils available at the time required a ·0005 or ·00045 μF condenser to ensure continuity of wave range. This size of tuning condenser was considered far too large for amateur work, and more important still, an efficient band-spreading arrangement could not be incorporated.

The tapped coil method of band spreading was finally decided upon as by this means each amateur band can be given any amount of spreading that is deemed desirable. The actual winding and construction of the coils will be dealt with later.

Bearing in mind the difficulty of locating and replacing 4-pin valve-based coils in a confined space such as a screening box, octal based coils were used. Each coil carries its own trimmer, mounted on top of the former as described later, and in the case of the oscillator coils a fixed "padder" is incorporated inside the former.

The IF Stages

Two 465 kc IF stages are utilised; 1,600 kc stages were considered, but at the time the receiver was constructed the necessary IF transformers of this frequency were not readily obtainable. In any case, the lower IF frequency enhances the selectivity and gain of the receiver, the only drawback being that the image is brought nearer to the desired signal than would be the case if an intermediate frequency of 1,600 kc was used.

No crystal filter or regeneration was employed in the IF stages, as apart from the impossibility of obtaining the necessary components for a crystal filter, it was not felt desirable to add complications to a first attempt at superhet construction. These features can be added at a later date, if desired, when some experience has been gained in the construction and operation of this type of Rx.

The two 6K7's used give adequate amplification, and a further IF stage, besides increasing background noise, would increase the difficulties of stabilising the set unless extreme care was taken. It is preferable to employ the best IF transformers available as cheap transformers greatly increase the risk of frequency drift and subsequent loss of amplification.

The choice of IF valves used will not affect the signal-to-noise ratio to

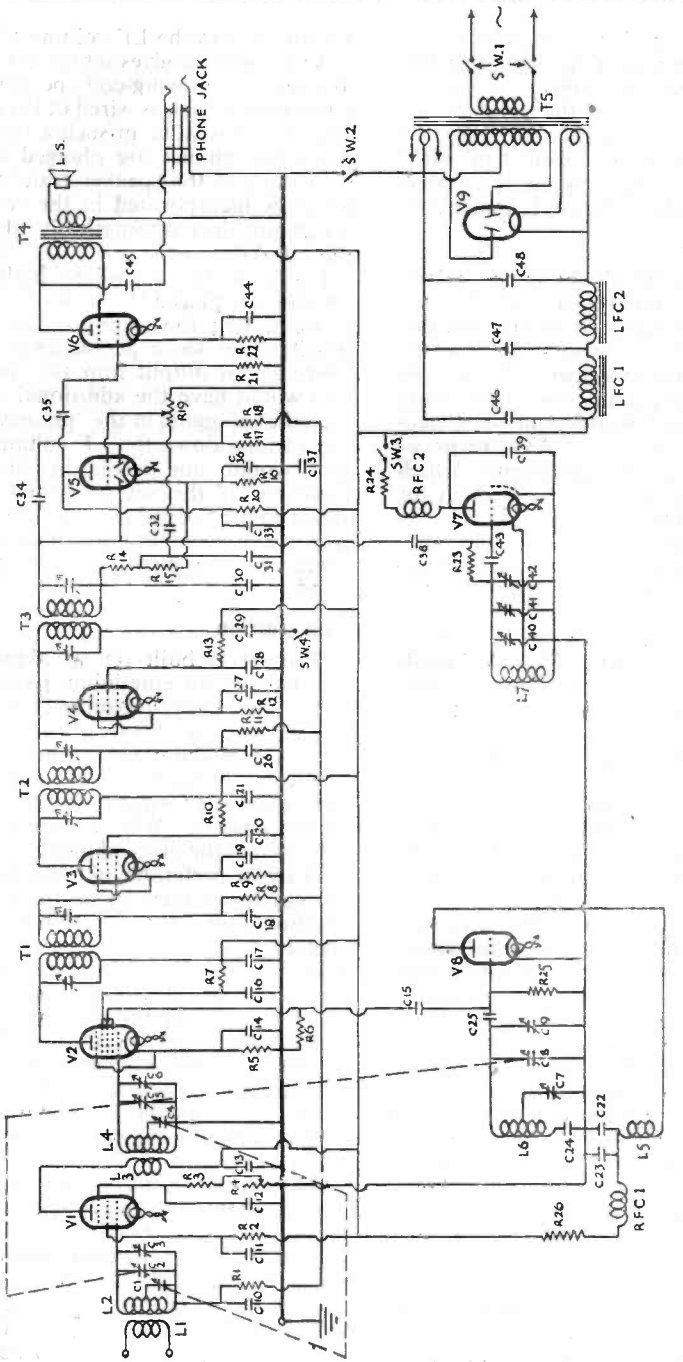


Fig. 1. Circuit of G6FW's communications receiver. *The main or band-set tuning condensers C2, C5, C8, are ganged together, as are the two band-spread condensers C1, C4. C7 is adjusted separately, but could be ganged with C1, C4. This point is discussed in the text. Standard components are used throughout, and the design and construction of the set are covered in detail in the body of the article.*

any degree, as this is mainly determined by the preceding mixer and RF amplifier. As mentioned previously, 6K7's were used in the original set purely because they were easy to obtain, but as long as valves of fairly high mutual conductance are employed the actual choice of valves is a wide one.

2nd Detector

A type 6Q7G double-diode triode was used as combined 2nd detector and audio amplifier, it being from this stage that the necessary voltage for AVC operation is drawn. The circuit is quite conventional, one diode being used for signal rectification or detection and the other for AVC rectification. It is of no consequence which diode is used for AVC, and which for detection. Delayed AVC is used, as otherwise the AVC effect would commence to operate on the weakest signals, where the full amplification available is necessary.

The working of the AVC can be explained as follows : The AVC diode is fed from the detector diode through the 100 $\mu\mu$F condenser C34 ; the resulting RF current corresponding to the incoming carrier is rectified by the AVC diode, and the resulting voltage developed across the diode load resistance R17 is applied in the form of negative bias to the grids of V1, V3 and V4 *via* the filtering resistances R18, R11, R8 and R1. The condensers C10, C18 and C26 constitute the necessary earth return for the various inductances. The AVC diode has a negative bias equal to the DC voltage drop across the 6Q7 cathode resistor R16. Until a signal of sufficient strength to neutralise the small negative voltage on the AVC diode is received it will be apparent that the AVC will not function. We thus have the condition known as " delayed " AVC, with the consequent advantages outlined above.

Audio voltage developed across the signal diode is tapped off at the junction of R14 and R15, and is applied *via* coupling condenser C32 to the grid of the 6Q7, the triode section of which functions as an ordinary triode LF amplifier. R19 forms the grid leak for V5, and is also the LF volume control.

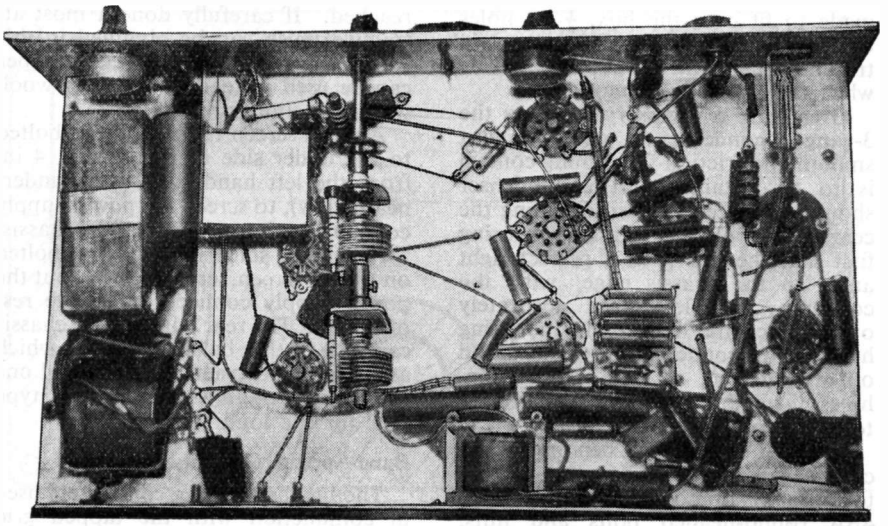
A 6F6 pentode gives sufficient volume to operate a moving-coil speaker, and a headphone jack is wired in the anode circuit of this valve in such a way that when the 'phones are plugged in, the secondary of the speaker transformer, which is incorporated in the receiver, is cut out, thus automatically silencing the speaker.

It is a matter of choice whether the 'phones are placed in the anode circuit of V6 or V5 ; the latter position would possibly suit some people as giving a lower audio output into the 'phones, and would have the additional advantage that plugging in the 'phones without turning down the LF volume control would not result in shattered eardrums if the set happened to be tuned to a powerful signal. The writer uses the set mainly with 'phones, and prefers to have plenty of audio gain in hand !

Construction

The set is built on an aluminium chassis with an aluminium panel $\frac{1}{8}$ in. thick. The panel measures 21 in. × 9 in. × $\frac{1}{8}$ in., and the chassis is made from a flat sheet of aluminium 19 in. × 15 in. × $\frac{1}{16}$ in., a flange $2\frac{1}{2}$ in. deep being bent down to form the front and rear of the chassis. Whilst the ends were left open in the original model, it would perhaps be preferable to bolt additional flanges across them to ensure complete rigidity, especially if a thin gauge of metal is used. However, when the set was assembled in a wooden cabinet and screwed into place, the whole assembly proved very strong, and no trouble was experienced due to lack of rigidity. Nowadays, at a reasonable cost, panels and chassis can be obtained made up to the builder's dimensions, thus eliminating the bending of a large sheet of metal.

The actual bending can, however, be completed very easily if two strong wooden battens, with a cross-section of 2 in. × 1 in. and several inches longer than the metal chassis, are bolted on either side of the sheet, with one side of the wood lined up along the line where the actual bend is to be made.



Underneath the chassis. *The two-gang condenser is for band-spread, C1, C4, in Fig. 1. The wiring plan is discussed in the text.*

The bending is then carried out by hammering gently along the flange until a right-angle bend is made. If done carefully the operation will result in a perfectly straight flange.

It is recommended that before the chassis is made, all components such as the ganged condenser, valve holders and IF transformers be placed on it in the positions shown in the photograph, and their mounting holes clearly marked. The centres of all valve holder holes, component mounting holes, and holes for the lower panel controls, such as switches, variable resistors and condensers, should then be centre punched. The position of the controls which will be mounted on the front chassis flange, and which will also pass through the lower portion of the front panel, must also be marked and centre-punched at this stage.

The holes for the valve-holders can be cut out with either a tank cutter used in a carpenter's brace, or with the special punching tool which is now obtainable, and all mounting holes drilled and cleaned of burrs. The holes for the panel controls can be drilled out with a $\frac{3}{8}$ in. or $\frac{1}{2}$ in. twist drill, according to the size of the fixing bolts, a $\frac{1}{4}$ in. pilot hole being made first in each case to prevent the larger drill drifting off centre.

The rectangular hole for the mains transformer was first marked out, and a $\frac{3}{8}$ in. hole drilled at each corner, the metal then being cut out with a key-hole saw. If such a saw is not available a clean job can be made by using a cold chisel, whilst supporting the chassis on a solid bench. All valve-holder and transformer holes are finally cleaned up with a file.

The coil screens were made up in the form of a rectangular aluminium box measuring 9 in. × $4\frac{1}{4}$ in. × 4 in., two partitions being inserted 3 in. from either end to separate the coils. In this case all measurements were carefully marked on the aluminium sheet, as were the positions of all fixing bolts, and provision was made for narrow flanges on each side of the base of the box so that the whole assembly could be bolted to the chassis. The screening partitions were fixed in position inside the box by similar small flanges, 6BA nuts and bolts being used throughout to hold the box together. A lid was

made to fit over the box, ½ in. holes being drilled so that the necessary trimming adjustments could be made when the coils were plugged in.

Great care is necessary in fixing the 3-ganged condenser in position, if a smooth and friction-free tuning control is to be obtained. The condenser should be placed in position along the centre line of the chassis, ensuring first that the line is at a perfect right angle to the chassis edge, with the condenser spindle placed accurately over the centre line. The mounting holes for the condenser are then marked out and drilled, as also are the ⅜ in. holes through which the connections to the stators are passed.

After all drilling and bending of the chassis is completed, the panel is fixed temporarily in position by means of 4BA round-headed bolts and nuts. The position of the mounting hole for the main tuning condenser dial is then very carefully marked on the rear of the panel.

The panel, still bolted to the chassis, is laid face downwards, care being taken not to scratch the surface, and the positions of the component fixing holes on the front flange of the chassis are carefully marked and centre-punched on the back of the panel. The panel can then be separated from the chassis, and after marking out the position of the holes for the above-chassis panel mounted components—such as oscillator band-spread condenser and dial, BFO condenser, dial light and so on—drilling of the panel can be commenced.

Panel Finish

After completion of the panel drilling it would be as well to consider the type of finish required for the front of the panel, before fixing the components. The high polish of aluminium is very susceptible to finger marks, and the writer found that an excellent matt finish could be obtained by rubbing all over the surface with a small ball of fine steel wool. Rub in a series of small circles commencing at one corner of the panel and work in parallel lines until the diagonally opposite corner is reached. If carefully done a most attractive finish can be obtained in this way. Worn glass paper or sand paper can be used instead of the steel wool, with very similar results.

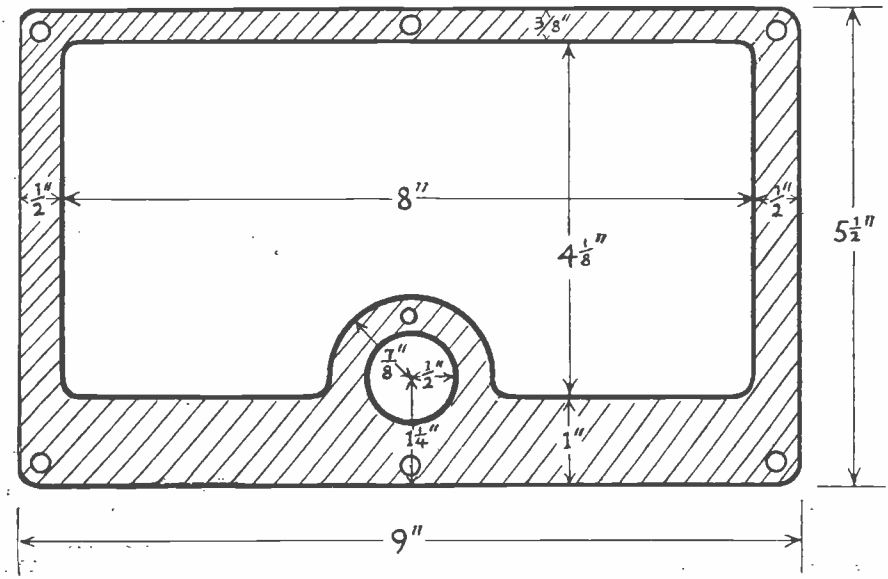
A metal screen 10 in. × 2 in. is bolted to the under side of the chassis, 4 in. from the left hand edge (near underneath view), to screen the power supply components from the rest of the chassis.

A bakelite soldering tag strip, bolted on to this screen, serves to bring out the power supply connections to the rest of the set. The rear edge of the chassis carries a further bakelite strip on which are mounted two aerial sockets and one earth socket, and a miniature type jack for the loud speaker.

Band-Spread Condenser Pack

The band spreading condensers used in conjunction with the tapped grid coils are 50 $\mu\mu$F Eddystones. The aerial and mixer band-spreaders are ganged and placed beneath the chassis, the oscillator condenser being fixed on the front panel to the right of the main tuning dial. This somewhat unusual arrangement was arrived at in an endeavour to obtain more accurate tracking over each amateur band, but if the components are slightly rearranged there is no reason why all three band-spreading condensers should not be ganged, and an extra control knob thus eliminated, as the mixer and aerial tuning is comparatively broad as compared with the oscillator tuning, and no difficulties should be experienced in obtaining good tracking if the coils are accurately matched. The original arrangement does, however, give some slight leeway in fixing the position of the band-spread tap on the mixer and aerial coils, and in use it is possible to tune in a signal on the band-spread dial, and then to peak it up on the lower mixer/aerial condenser control.

The two ganged condensers are supported on aluminium brackets and coupled together by means of a brass coupler, a flexible coupler being used between the control spindle and the two ganged condensers. Here, again, every care should be taken to ensure



Sketch of the dial bezel, or escutcheon; used by G6FW when adapting his Muirhead drive for a calibrated scale.

friction free movement of the ganged condensers, and it is recommended tnat the holes for the fixing brackets be drilled after arranging the ganged condensers and extension spindle in their final positions. By making the bracket hole slightly larger than is necessary any slight error can easily be remedied by adjusting the fixing nuts of each condenser when the assembly is bolted into place on the chassis.

In the original model a Muirhead precision dial was employed and the slow-motion head fixed directly on the condenser spindle, no extension spindle or flexible connection being used. It will be readily apparent that if the dial is to work smoothly, the condenser spindle *must* be at a perfect right angle to the panel, and great care should be taken with this point. The mounting hole for the slow-motion head should be made slightly larger than necessary so that any slight unavoidable error in centering the spindle can be taken up when fixing the dial in position.

As direct calibration of the tuning dial was desired the Muirhead dial was adapted to the form of the familiar National ACN dial. A separate diagram gives the constructional details and dimensions of the dial, the metal frame of which is cut from a sheet of 1/8 in. aluminium, being enamelled glossy black after all holes had been drilled. The dial pointer was made from a paper clip straightened out and hammered flat to give a " knife-edge," the stiff flat wire thus obtained being carefully filed, glass-papered and cut to size. The original circular metal scale was removed by unscrewing the three fixing bolts, and a soldering tag was bolted into position on the brass boss, one of the original fixing holes of the metal dial scale being utilised. The wire pointer was then carefully soldered to the tag. The metal frame of the dial, with the calibration card beneath it, was then placed on the front of the panel and carefully centred. The positions of the fixing holes were then marked, using the dial frame as a template, the holes being drilled and tapped 6BA.

BFO Unit

The BFO coil, associate fixed condenser, grid condenser and resistance are housed in an aluminium can 2 in. in diameter and 3 in. high. The coil itself (L7 in Fig. 1) consists of 150 turns of No. 30 DSC, wound on a 1 in. diameter paxolin former, centre tapped. A ·0002 μF fixed mica condenser, supported inside the coil former, is connected across the winding, and a ·0001 μF trimmer, the control screw of which is manipulated through a hole in the top of the can, is connected in parallel. A two-plate variable, fixed to the panel of the receiver, is also provided in parallel with the aforementioned condensers to enable fine control of the BFO frequency to be obtained. The connections to the panel variable are made by means of a piece of screened wire, the screening of which is connected at one end to the " earthy" side of the coil and condensers, and to the screening can, and at the other end to the rotor of the panel variable. The screened wire connects the grid end of the coil to the stator of the panel variable.

The grid and cathode leads are brought out underneath the screening can to the 6C5 oscillator. These leads are also screened and the screening earthed to avoid any possibility of external pick-up of the beat frequency oscillators.

As very little coupling is needed between the BFO and V5, a screened lead is taken from the grid of V7, 1 in. of the free end being left unscreened. Around the free end is wound five turns of insulated wire, which is connected to the diode lead of V5. The actual BFO voltage injected into V5 can thus be easily varied by increasing or decreasing the number of turns wrapped around the oscillator grid lead. The number of turns given will, however, prove correct, if all circuit values are adhered to.

The whole BFO unit should be constructed before the set is wired, and can be tested for frequency in a separate oscillator, if desired.

If possible, a metal 6C5 should be used in the V7 position, and the shell earthed, this valve being placed as close as possible to the BFO coil unit, to ensure short leads.

At this stage the panel should be bolted to the chassis, and all components mounted on both chassis and panel, after which wiring can be commenced.

(*To be concluded next month*)

MACMILLAN'S *BOWDOIN*—KLPO

Between the beginning of July and the end of August, Commander D. B. Macmillan, of American Arctic exploration fame, did a trip in his motor-schooner *Bowdoin* into the lonely wastes of North-Eastern Canada, to renew contact with the Esquimaux and missionary stations in those parts. As in pre-war days, an American amateur joined as ship's operator, and schedules with various W's and VE's were arranged to handle traffic.

On this occasion, W1KKS was the operator and KLPO—on frequencies 12480, 8250 and 4150 kc, near enough to the 14, 7 and 3·5 mc amateur bands to attract attention—was the call-sign.

The voyage was curtailed due to ice conditions and as far as we know only the American and Canadian amateur stations on the schedules made contact with the Expedition. It is to be hoped that next year's trip will be notified in good time for G's to have an opportunity of working the *Bowdoin*, as several did before the war.

When operating break-in, single-channel, use "BKS" as the procedure signal. If this is sent while calling, other operators will know that the station concerned can not only work break-in, but is listening on his own frequency for replies.

More About the Franklin

Further Notes on a VFO Capable of CC Stability

By J. HUM (G5UM)

Many amateurs have commented—and it is fair to say that almost without exception the comments were enthusiastic—upon the article "Franklin for VFO" in the July issue of the *Short Wave Magazine*. Indeed, within three weeks of its appearance all four 1·7 mc stations in one town were using identical Franklin rigs! This, however, is no excuse for sitting back and feeling smug about it. Inevitably, there have been a number of queries both over the air and in the course of conversation. It is proposed, therefore, briefly to amplify one or two detail points.

The Buffer Amplifier Stage

Everyone seems to manage to make the Franklin oscillator work. However, a number complained that insufficient drive can be obtained from it. In every such case it was ascertained that constructors had not adhered to the advice given in the July article about the correct use of a buffer amplifier. Some were attempting to use the Franklin with no buffer amplifier at all—with obvious lack of success, since the Franklin gives little more output than the local oscillator of the ordinary superheterodyne. Others were adhering to the screen-grid type of buffer amplifier advocated in many earlier designs.

It cannot be too strongly emphasised that the buffer amplifier must possess adequate power handling capabilities—and that is just what the small screen grid type of amplifier does *not* possess. It will be remembered from the July article that the advice was to feed the output of the Franklin into the grid of a crystal-oscillator type of valve; in the writer's case a 6V6G is used as the CO and has in its grid circuit a 7-position switch with crystals on six of the points and the Franklin output on the seventh. An 807 final amplifier follows the 6V6G and can be driven to the full 10 watts input by crystal or VFO at will.

Condenser Values

One constructor informed the writer that he could get nothing but rude-sounding AC notes all round the scale when he tried out the Franklin. The trouble here was soon pinned down to nothing worse than too low a value of capacity in the oscillator grid circuit. The original article pointed out the importance of high-C in that position.

While writing of condenser values it may be of interest to state that one user tried out a coupling condenser of as high a value as ·001 μF, in spite of the writer's cautious advocacy of nothing larger than ·0001 μF. And it worked! In fact, it drove a small pentode following stage to six watts input—which goes to show the importance of trying things out for oneself and not sticking too closely to the book.

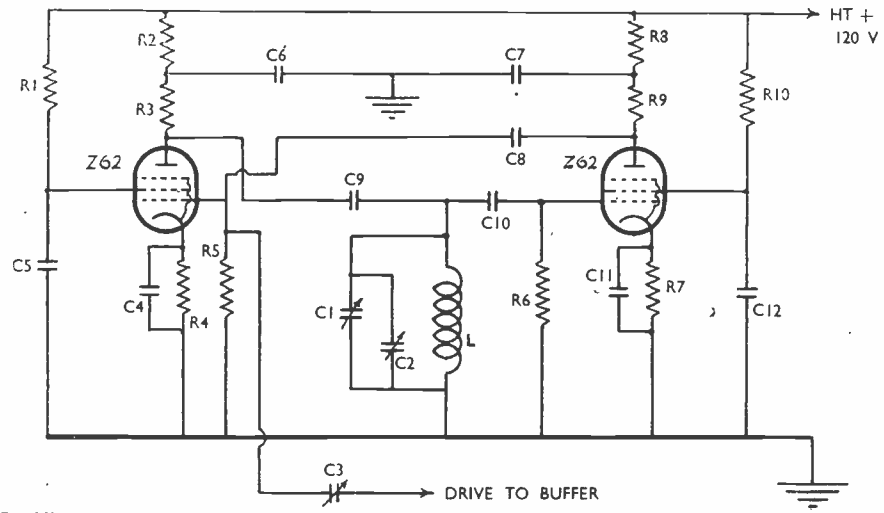
Calibration

Readers were warned of the importance of having a crystal about the place if they decide to "go VFO," for accurate calibration of any drive-oscillator is of the utmost importance. Licensed amateurs should re-read their permits, where they will see that if they do not use direct crystal control they must be able to measure their frequencies to 0·1 of 1 per cent. This means that a Franklin used at 2 mc must be adjusted within 2 kc. The use of a Muirhead or similar type scale permits this to be done with the greatest of ease. The writer has surprised a number of crystal-controlled stations by telling them their crystal frequencies to close accuracy. Every user of a variable frequency oscillator should be able to do the same. In fact, such users should be able to work within a kilocycle or two of the edge of the band without receiving a "pinkie" from the Post Office.

Crystal Control with a Franklin

Finally, writing of crystal-controlled stations reminds one to state that a Franklin oscillator can be used as a crystal oscillator if so desired. Its grid coil and associated capacity are removed and a crystal connected across grid-to-earth in its place.

In a permanent design this facility could be simply furnished by a switch that "lifts" coil and condenser off chassis and connects in the crystal holder in their



Franklin oscillator circuit using the Osram Z62 or Mazda SP41 television pentodes. *Constants for C1, C2, L, should be chosen for the band used (3·5 or 1·7 mc) and with 120 volts on the plates of these valves, 48 volts peak drive can be obtained to the grid of the buffer amplifier. This circuit lends itself to experimental work for producing a stable VFO on the higher frequency bands.*

place (the top end of coil, condenser and crystal holder of course remaining permanently connected to grid).

This characteristic of the Franklin oscillator to "fire" at the frequency presented to its grid can be turned to many other uses too long to discuss now. Apart from inserting coils and condensers or crystals into its grid, it will do interesting things with various values of R and C.

A Reader's Circuit

(*Editorial Note.*—Arising from the original article, K. W. Cranfield makes the comments following.)

In regard to the use of high-slope television pentodes, the short-based Z62 and the SP41 have given very satisfactory results in this type of oscillator when operated as tetrodes. The circuit employed is given herewith. When using 120 volts HT and a coupling capacity of 14 $\mu\mu$F, 48 volts peak drive has been obtained.

A Franklin on 3·5 mc was fed into a tuned buffer *via* a variable capacity with a minimum value of 1 $\mu\mu$F and a maximum of 14 $\mu\mu$F. The buffer tank was then swung through resonance and the change in frequency of the oscillator measured for varying degrees of coupling capacity. With 1 $\mu\mu$F, the frequency change was 400 cps and at 12·5 $\mu\mu$F it was 2,200 cps.

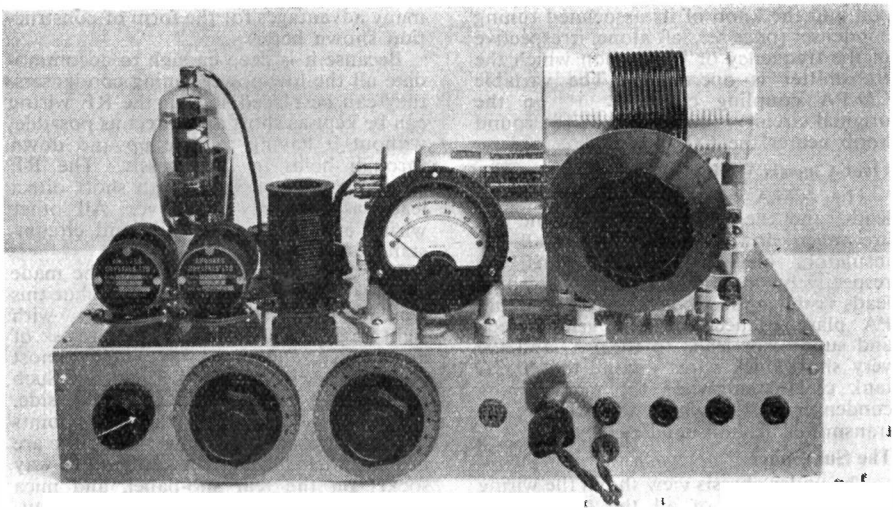
This change of frequency with coupling was found to follow almost a linear law. Therefore, it is advisable to add a buffer stage if one desires stability equal to crystal control. The Franklin is quite capable of providing this if it is constructed on sound mechanical principles with link coupling to the buffer—though this is usually more a matter of convenience than necessity.

As to the amount of drive that can be obtained, this was found to obey an exponential law. The rate of increase of the drive voltage falls off as the coupling capacity is increased, thus: At minimum coupling, the drive was 9·8 volts peak, rising to 27 volts at 4 $\mu\mu$F and 48 volts at 13 $\mu\mu$F.

Table of Values

C1	25 $\mu\mu$F.
C2	250 $\mu\mu$F.
C3	1-14 $\mu\mu$F.
C4, C5, C11, C12	0·1 μF.
C6, C7	·05 μF.
C8	·0003 μF.
C9, C10	3 $\mu\mu$F.
R1, R10	50,000 ohms.
R2, R8	1,000 ohms.
R3, R5, R6, R9	10,000 ohms.
R4, R7	150 ohms.
L	Coil for band required.

Valves, Z62 or SP41.



A 7/14 mc Transmitter

Further Notes on the July Article

MAGAZINE CONSTRUCTIONAL DESIGN

On pp. 312-313 of the July issue of the *Magazine*, the circuit and some preliminary details were given of a simple transmitter for the 7 and 14 mc bands. It has been intended to follow with the constructional data in August, but having started work on the prototype, we had a few more ideas, which are incorporated in the model illustrated here.

Broadly, the circuit is still tritet-CO-PA, with a 5B/250A driving a 4052A, but with certain refinements.

The drive oscillator can be switched from straight CO(7 mc) to tritet(14 mc) and there is a choice of two switched crystal frequencies in each band—one in the CW and the other in the 'phone area. Moreover, the CO tank coil is tapped and, by means of a padder condenser, the switching makes the change-over from 7 to 14 mc without it being necessary to plug in another CO coil, change a crystal or touch the tuning on the drive side.

Grid-block keying of the CO is used, and with 120 negatives bias under key-up conditions, a clean sharp note is obtainable.

General Description

Looking at the heading photograph, the flock of four Brookes 7 mc crystals give the various drive frequencies. Behind them is the 5B/250A oscillator and between the meter and the crystal assembly is the CO tank coil.

Along the bottom sub-panel are, left to right, the frequency selector switch, the CO tank padder condenser and the CO tank main tuning capacity.

On the same line are the jacks for keying, CO screen, CO plate, PA grid, PA plate and PA suppressor grid modulation. The meter reads 0-50 mA in both CO and the PA grid jacks, but is shunted to give 0-150 mA (x 3) when plugged into the PA plate jack; this is accomplished quite simply by a low-value resistor across the jack points, arrived at by "cut-and-try."

The large condenser on the right above the chassis is of course the PA tank tuning capacity and behind is the PA tank coil.

The 4052A is mounted horizontally along the rear edge of the chassis, which is 17 in. by 10 in. by 3 in. deep. This allows for placing all the tuning capacities except the output tank condenser in the sub-space—see under-chassis view.

The other over-chassis photograph shows, at the back of the CO, the cathode

coil and the knob of its associated tuning condenser (once set, left alone, irrespective of the frequency or band upon which the transmitter is operating). The variable CO-PA coupling condenser (C in the original circuit) is controlled by the round knob nearer the CO tank coil.

Over-Chassis Wiring

The 4052A filament leads, the meter leads, and the HT feed lead to the PA are taken down through the small s/o insulators on which these items are respectively mounted. Thus, the only leads visible above the chassis are CO and PA plate connections, the grid, screen and suppressor leads to the PA, and the very short thick wires joining the 4052A tank coil assembly to the main tuning condenser. All of which helps to give the transmitter an unusually clean finish.

The Sub-Space

The under-chassis view shows the wiring and the placing of all the other components. A chassis with what we think is the more sensible 3 in. sub-space has many advantages for the form of construction shown here.

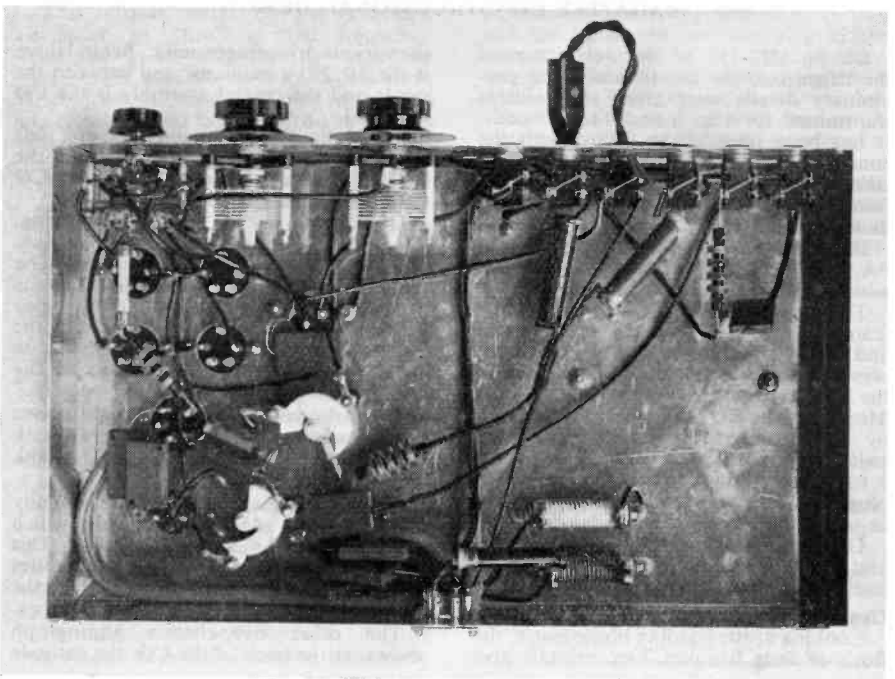
Because it is deep enough to accommodate all the low-power tuning condensers, they can be placed so that the RF wiring can be kept as short and direct as possible, without it having to dive up and down through holes in the chassis. The RF section should be wired with short direct leads as the only objective. All other wiring can be run as fancy and circumstances dictate.

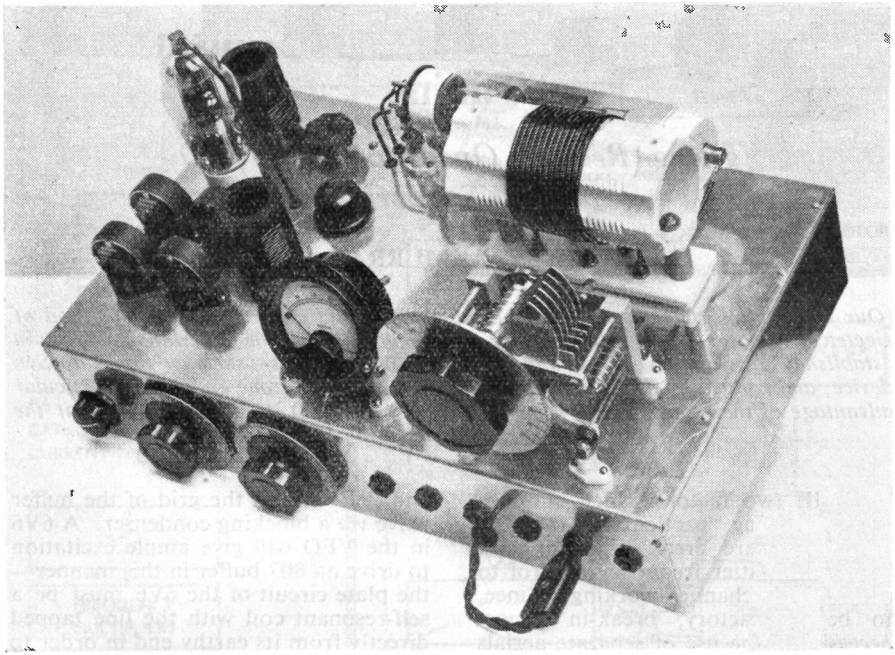
In other words, the job could be made to *look* much neater underneath, but this would involve longer RF leads, with right-angle bends in the interests of appearance, and the result would almost certainly be poor performance. Such wiring *must* be avoided on the RF side.

The only other constructional points to note are that all power supplies are brought in through a Bulgin 10-way socket on the rear sub-panel, and mica by-pass condensers are used throughout.

The change-over switch is a two-gang Yaxley type, with insulated rotor and wide

The arrangements underneath. *Placing of the parts is such as to ensure the shortest possible RF wiring. All supply leads, and the PA filament centre-tap, are brought in at the 10-way socket on the rear sub-panel.*





Another view, showing the mounting of the parts above the chassis. *Note that the* 0-50 *mA meter, shunted at the jack in the PA position to read* 0-150 *mA, is on stand-offs, down through which its leads are taken*

rotor blades for connecting adjacent pairs of contacts. A switch of this kind can be arranged to give a considerable variety of motions.

Performance

The transmitter is photographed as set up for 7 mc. With the grid coupling condenser at half-mesh, the drive oscillator will put 10 mA into the grid of the 4052A with the selector switch at any of the four frequency settings; that is, whether the CO is working straight on 7 mc or in tritet on 14 mc.

This is more than enough to push the 4052A to 100 watts input on CW with 1,000 volts on the plate. With efficiencies around 70 per cent.—which should be obtainable with proper loading and about 8 mA drive—this means 70-75 watts of RF power output.

Under average conditions and allowing for all reasonable inefficiencies and losses in the aerial matching network, a two-valve transmitter built on the lines given here should put at least 60 watts *into the aerial* on both bands.

McELROY-ADAMS HALLICRAFTERS EQUIPMENT

The British-built Hallicrafters S-40, an 8-valve superhet covering the range 540 kc to 43 mc in four switched bands, will become available for distribution about the end of this month. It is provisionally priced at £28, inclusive of tax, and incorporates electrical band-spread, noise-limiter, built-in speaker, BFO and other communications receiver refinements, but no crystal-gate. Mullard valves are used throughout.

On the transmitter side, McElroy-Adams will have their H.T.9 ready about the same time. This is a five-band CW/'Phone transmitter, with incorporated power supply and band-switching. Built in a table-mounting cabinet, it is complete and ready to go on the air with the addition only of power line, aerial, earth and microphone. The provisional price of the H.T.9 is £80, including all 15 valves, and a set of coils with crystal for any one band to order.

We expect to be publishing extended test reports on these attractive equipments in early issues.

VFO-Controlled Remote Transmitter Tuning

System giving Remote Operation with VFO Control and BKS Working

By **Lieut. W. A. MURRAY, R.N.**

(Our contributor suggests an extremely ingenious and quite practicable method of electrical remote control which offers considerable scope for experiment. Certain established mechano-electrical remote-controlling systems—such as the Auto-Syn device, and control by distant tuning motors—achieve the same end. The particular advantage of the system put forward here is that the VFO itself can be kept at the remote operating position.—Ed.)

THE two factors which simplify operating, particularly for DX work, are break-in keying and VFO transmitter frequency control to allow single-channel working. Since, to be satisfactory, break-in almost necessitates the use of separate aerials for transmitting and receiving, and hence physical separation of the transmitter from the operating position, it seems that the full benefit of break-in with VFO control as well is difficult unless the transmitter can be remotely tuned with accuracy.* The object, then, is to make it possible for the operator to tune a shielded VFO at his operating position and for his remotely switched and keyed transmitter—say, in the garden shed—to follow up and tune itself to the VFO signal automatically.

Suggested Method

The block control diagram for such a system is shown in Fig. 1. The VFO gives its output at the operating frequency (the necessary doubling being done in the VFO itself at very low power), the final valve of the VFO being in the 6V6 class, operated under Class-A conditions. Output is taken *via* 75-ohm cable to the input of the transmitter, where the line is terminated with two 150-ohm carbon resistances in parallel; one side of the line is connected to transmitter earth and the other to the grid of the buffer valve *via* a blocking condenser. A 6V6 in the VFO will give ample excitation to drive an 807 buffer in this manner—the plate circuit of the 6V6 must be a self-resonant coil with the line tapped directly from its earthy end in order to avoid having to neutralise the 807, the object being to keep the grid clear of tuned circuits.

The buffer is link-coupled to the power amplifier, which can be of any type. The buffer anode tank is ganged with the PA grid and anode tanks and also with a tuned circuit using identical L/C values in the discriminator unit, which is built on the rear of the transmitter chassis. The circuit of the discriminator is shown in Fig. 2. It is patterned after a design by Foster and Seeley which is used in some commercial broadcast receivers to correct for oscillator frequency drift.

The Discriminator

Its action relies on the phase-differences between loosely-coupled primary (L1/C1, the buffer tank) and secondary (L2/C2) tuned circuits, which is 90 degrees when the resonant frequency is applied but varies between 45 and 135 degrees when the applied

(This is not strictly true. But what is not possible without some such system as is described here is* **remote operation** *with VFO control. It is a difference in emphasis which does not affect the argument. —Ed.)*

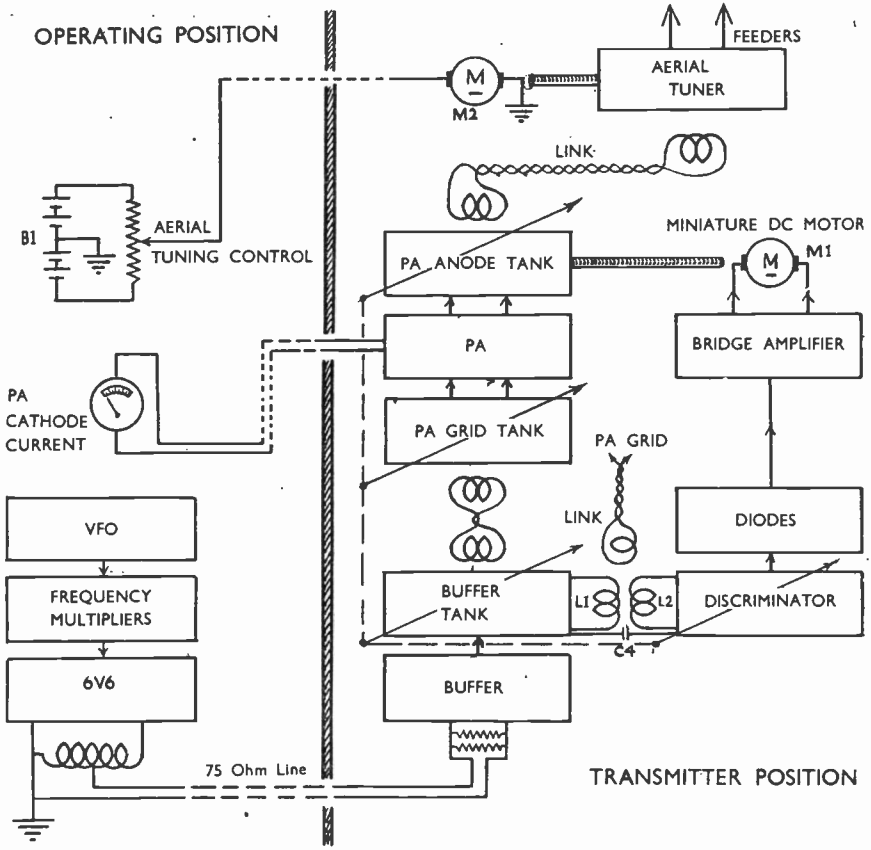


Fig. 1. Block schematic diagram of the control system layout. *The VFO drive, fed through a low-impedance line, provides the tuning control through the action of the discriminator and bridge amplifier ; this in turn operates the tuning motor M1, which drives the ganged transmitter controls. The "follow" is immediate and automatic and is directly dependent upon the VFO setting. A remote reading PA milliammeter at the operating position checks the functioning of the system, and the second tuning motor M2 is independently controlled by means of the bridge balance B1 for adjustment of the output tuning.*

frequency is varied from side to side. The potentials at the ends of the secondary circuit L2/C2 are 180 degrees out of phase with each other as seen from the centre-tap. Thus, if the centre-tap is capacity-coupled *via* C4 to the "hot" end of the primary, the RF potentials at either end of the secondary will be equal with respect to earth over each half-cycle when the resonant frequency is applied, and the voltages developed across the diode load resistances, being equal and opposite, will cancel each other out. (The diode DC return is *via* the filter RFC/C5, which has no other function.)

However, if the applied frequency is above or below resonance a higher voltage will be developed across R1 than across R2 or *vice-versa*, because due to the phase-shift one diode is conductive over a longer period during the cycle than the other. This results in an output voltage positive or negative to earth potential, or equal to it, being generated, depending on whether the applied frequency is above, below or at resonance.

Motor Control

This generated voltage is passed on directly to the grid of the amplifier, which is used solely to provide power (i.e., current with the voltage) sufficient to run a small DC motor. In Fig. 3 a 6L6 is shown, and this can be coaxed into passing 80 mA or so over short periods. If the motor armature requires more current any number of 6L6's can be parallelled to increase the current. The action of the circuit is on the bridge principle. R1 and R2 are equal, and R3 is equal to the DC resistance of the valve(s) at the operating conditions of VP-250V, VSC-200V, VG-15V negative. Bias is obtained by running the whole circuit at 15 volts positive to earth; no grid current is taken by the 6L6, and the bias source must be absolutely constant for the circuit to operate. When the signal voltage is positive or negative to earth the 6L6 will pass a greater or less current (because its bias is effectively 15 volts plus or minus the signal voltage) thus unbalancing the bridge and causing current to pass through the motor armature.

The zero balancing is trimmed by R4 which with R5 and R6 forms a potentiometer across the 500-volt supply and controls the screen voltage (and hence the conductivity) of the 6L6. The HT supply is made 500 volts so that the bridge can be working at best efficiency; the motor being about halfway up the R2-R3 and R1-6L6 potentiometers, with a standing 250 volts across the 6L6. Since the voltage will increase considerably when the circuit is operating no greater standing voltage can be allowed here to keep a reasonable safety margin under the valve dissipation. The "harshness" of the control can be adjusted by changing the motor field current. Note that the armature of the motor is some 260 volts above earth.

Thus, when the VFO signal is shifted in frequency, it passes straight through the buffer without tuning and sets up an unbalance in the discriminator-buffer-tank circuit. This produces a voltage across the diode loads which controls the 6L6 grid, unbalancing the bridge. The unbalance in the bridge circuit drives the motor, which is connected to the ganged tuning control and continues to tune the transmitter until the unbalance is removed. This happens when the buffer and discriminator circuits are again resonant to the applied frequency.

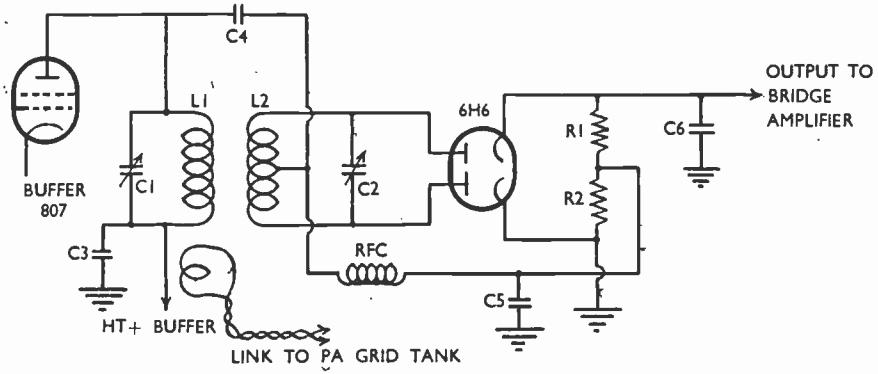


Fig. 2. The discriminator circuit. *A change of phase in C2/L1 relative to C2/L2, produced by a change in frequency of the VFO at the operating position, causes an unbalance in the 6H6 diodes. The output from the 6H6 is fed to the bridge amplifier (Fig. 3), which actuates the tuning motor M1. Since C1 is ganged with the other motor-controlled Tx tuning circuits, it is pulled round until again in resonance with the VFO at the new frequency. When diode balance is thus once more restored, the action ceases; this stops the tuning motor, with all Tx circuits in tune at the new frequency.*

Circuit Tracking

Tracking is best done by trimmers and moving inductive loops on the buffer and discriminator tanks, taking the PA tank as standard. Fixed bias should be used for safety on the PA while the buffer is out of tune and supplying no excitation.

The PA cathode current is run on a large core cable to the PA meter at the operating position, where it serves as a check that the tuning gear is operating correctly. Its other function is to assist in tuning the aerial circuit, which cannot be ganged to the transmitter satisfactorily. It is tuned for maximum PA current by a small motor of its own, controlled from the operating position.

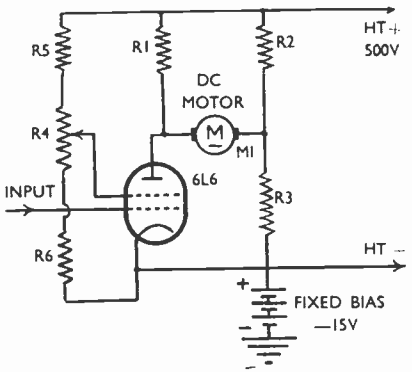


Fig. 3. The bridge amplifier. *The input from the 6H6 (Fig. 2) varies the plate current of the 6L6 either "positive" or "negative" in the manner explained in the text; this operates the miniature DC tuning motor, driving the tuned circuits, in either the clockwise or anti-clockwise direction. The direction and degree of tune are directly determined by the VFO setting with respect to the frequency on which the transmitter was first set up.*

Getting A Good Earth

It is Important

Commonly, those starting operations on the top band employ their HF aerial system "against ground." Lack of success in the subsequent attempts to raise DX on 1·7 mc can frequently be attributed to the fact that the "ground" is ground in name only and certainly not in effect.

In other words, the earth connection is far more important than many short wave enthusiasts might think. Elementary books on radio advise the use of a cold-water pipe as a suitable earth connection. Certainly it will do if it goes straight down to ground and is not covered with oxide, paint, concrete, plaster, or any other coating that prevents a good contact with the soil.

Unless these desiderata can be obtained it is preferable to construct a proper earth connection as close to the radio room as possible, even if this means digging up part of the garden lawn, as it so frequently does. To say that a large hole should be dug and filled with tin cans sounds rather like the stage comedian's description of "How to build a wireless set"—but it happens to be perfectly true.

One amateur we know collected baby food tins for a month, soldered them all together and buried them with their openings uppermost, so that they collected rain water and remained always in an extremely conductive state. Two such earths were constructed 6 ft. apart, and the connection from each taken separately to the apparatus.

The use of two connections "in parallel" as described gave a worth-while improvement in transmitter output against the use of one only.

If in this day and age writing of earth connections may sound elementary, one may conclude by pointing out that the BBC go to immense pains when constructing their transmitting stations to ensure that a large and adequate earth is always laid down; secondly, in radar practice where a good natural earth is not available, a horizontal wire network structure is erected on stakes over a wide expanse of field to provide the same effect.

The professionals' perspicacity in providing good earth connections is a lesson for the amateurs.

Discussing Eighty Metres

Splitting 3·5 mc for 'Phone/CW Operation

By AUSTIN FORSYTH, O.B.E. (G6FO)

Editor

THE return of the 80-metre band is, in some respects, one of the most important of the recent restorations in the amateur frequency range. Our 3·5 mc band is unique in that it gives—at the right time of day and in due season—good conditions for local G, European and semi-DX working, all to quite a dependable extent. It is an "easy" band technically, and with conditions as they are at present, 25 watts is sufficient power for good results.

Potentialities of "80"

During daylight hours, much of the Kingdom can be covered with 25 watts CW. In the early evening and after dark, the Europeans are equally easy to work, and in the early mornings during the winter season, East Coast W's are possible.

Many G stations are already achieving results along these lines, including QSO's with the Americans. Even ZL used sometimes to be worked in pre-war days, but Antipodean contacts are by no means easy and can be regarded as real DX of the highest order.

The purpose of this note is to lend emphasis to these facts and to suggest what is felt to be a rational approach to 80 metres, in the interests of all concerned.

Opinions

During recent sessions on 3·5 mc (we spend a good deal of time simply listening round on all amateur bands) two points of view have been expressed by several operators whose experience entitles them to have their opinions respected.

The first suggestion is that 80 metres is a local 'phone band and should be used as such, for which purpose it certainly gives excellent results, as already implied.

The other opinion is that the band should not be divided into 'phone/CW areas because the 'phone operators outnumber the CW stations.

Both these opinions are based upon faulty assumptions. In the first place, any band which yields DX and distant Europeans cannot fairly be described as a "local 'phone band." Secondly, the assertion that the relative balance between the regular 'phone and CW stations is in favour of the 'phones is questionable at the moment, to say the least, and will certainly be much more so in the near future.

The fact surely is that 3·5 mc is an ideal band for Class-A operators, for the scope that it provides will keep any one of them busy for quite twelve months. By making the band habitable for them, the pressure on 14 mc will to a certain extent be relieved ; the latter band is now nothing but a shambles for all except those who can operate during the quiet week-day periods.

Another factor is that too many stations are using too much power on 3·5 mc. Though Class-B operators are allowed 150 watts on 80 metres, it is the first time in history that a blanket authorisation of this kind has been given for 3·5 mc ; the fact that so much power is allowed does not necessarily mean it is a good thing to use it.

Splitting the Band

To come, then, to the point—the firm suggestion is that the 3·5 mc band

should be rationalised to the extent that the 'phones take the HF section 3685-3800 kc, and the CW stations operate in the LF area 3500-3635 kc.

It is also suggested that there should be an unwritten rule that no G station uses more than 50 watts, CW or 'phone. This suggestion is made in all seriousness, in spite of the fact that many people who may have read thus far will have murmured "What a hope ! "

But 80 metres has always been a relatively clean band, in that the licence conditions were respected and operation has in general been up to a reasonable standard.

Objections

There is no twist about these proposals, which are made in what are believed to be the interests of all users of 3·5 mc. They are full of objections, of course—no band-rationalising plan can be free of criticism.

What about the Europeans ? And the people who only have LF crystals but want to work 'phone ? And what happens if a 'phone operator wishes to do some CW ? And why should the 'phones have less than half the available territory when it is well known that a modulated transmission requires more than five times the band-width of a CW signal ? In view of all these objections, surely it would be better to use the band on a catch-as-catch-can basis, free for all, with the best stations getting the contacts ?

Counter-Argument

There may well be other objections which have not been covered above. But there are certainly answers to all those made there : The European 'phones will soon follow suit, because the G's outnumber the rest of Europe put together ; anyway, the HB's are already operating to the plan suggested. As to the crystal difficulty, there are two answers—it can hardly be accepted that many 'phone operators would be unable to provide themselves with crystals for the section they want, and anyhow, what about VFO control so that operation can be in either section of the band ?

THE AMATEUR BANDS

Following are the bands now open for amateur operation :

1715-2000 kc	10 watts (A) and (B)
3500-3635 kc 3685-3800 kc	25 watts (A), 150 watts (B).
7150-7300 kc	25 watts (A), 150 watts (B)
14100-14300 kc	25 watts (A), 150 watts (B)
28000-30000 kc	25 watts (A), 150 watts (B)
58500-60000 kc	25 watts (A) and (B)

Note that the two sections of the 7 and 14 mc bands allotted are not in harmonic relation. Telephony operation should be confined to the areas 3685-3800, 7200-7300, 14200-14300, and 28500-29500 kc. "A" licences are all three-letter calls issued post-war, and are for CW operation only ; licensees in this category are not normally allowed the use of telephony and full power till they have had twelve months' experience. Class "B" licensees are holders of reissued pre-war two-letter call signs, and are allowed the unrestricted use of CW, MCW and 'Phone with power as given above. In special cases, some immediate "B" licences are being issued to operators who would normally only qualify for the "A" licence.

As to the relative band-widths of CW and 'phone transmissions, the time has now come for top-cut telephony and more considerate 'phone operation on *all* bands. There can no longer be great respect for operators who strive for deep control and high-quality telephony for its own sake. Though a laudable objective in one way, the truth is that it is relatively easy to achieve and, experimentally, all such work can be done on a closed circuit. The objection to well-modulated quality 'phone is simply that it takes up far too much room, owing to the wider side-bands transmitted when the speech is really as good as it can be. The aim should surely be *intelligible* speech with the narrowest possible band-width, using voice-controlled carrier technique. This is quite a different matter and does involve a certain amount of cleverness—but not much.

One beautifully-modulated 3·5 mc 'phone, using 100 watts, will rub out 10-15 low-power CW stations. His microphone manner will not prevent his call-sign from being cursed up and down the country.

Consideration for Class-A's

The reason why the band should not be used on a free-for-all basis is because there must be more consideration for the very large number of newly-licensed operators who not only need space in which to move but also are compelled to get their wings on CW—the "twelve months' probation" so widely approved by pre-war full licence holders—before they are allowed to use 'phone at all.

To summarise, then, the proposals—to which it is hoped that the majority of experienced 3·5 mc operators will agree, unless they have better arguments of their own—are that the 80-metre band should be used as follows :

3,500-3,635 kc CW only
3,685-3,800 kc 'Phone only
Power Limit for Class-B stations, 50 watts—CW and 'Phone

A good deal of space has been taken to discuss the ethics of 80 metres, because it is felt that large issues are involved, in that many of the arguments are applicable to all bands.

Let us know what *you* think—we should particularly like to have opinions from Class-B men with current experience on 80 metres.

THE SHORT WAVE LISTENER

As announced last month, the first issue of our new companion publication *The Short Wave Listener* is to make an entrance on October 17. Its 26 pp. of text range over all SWL interests, with particular reference to DX reception on the amateur bands.

Correspondence on DX doings will be specially welcome as there will be ample space to cover SWL activities in this respect.

The Direct Subscription List for *The Short Wave Listener* is filling up rapidly, and copies will be posted to subscribers on the third Thursday of each month, commencing October 17. If you want it, send 16s. to the Circulation Manager, *The Short Wave Listener*, 49 Victoria Street, London, S.W.1. This will ensure your having a copy by post every month for a year.

★ ★ ★

EDDYSTONE'S MANUAL

Before the war, Messrs. Stratton produced a very useful publication, containing a number of constructional designs to which their components could be applied.

The latest edition is now available, price 2s. 6d. It can be had of Eddystone dealers, who are also supplied with the new issue of the excellent Eddystone catalogue, listing a wide range of Amateur Radio parts and equipment.

MORE NEWS FROM CZECHO-SLOVAKIA

The OK's are doing well with their frequency allocations. They now have 1750-2000 kc and the *whole* of the 3·5, 7, 14, 28 and 56 mc bands. 3·5 mc is less the usual European gap of 50 kc from 3635 kc, and it is true that in general CW only is allowed. There is, however, a special 'phone allocation in the range 3850-3900 kc, and from 56 mc upwards, 'phone and ICW are permitted on all the UHF bands.

These are 112-118, 224-230, 408-420 mc and useful areas between 2300 and 22000 mc ! There are three categories of licence :

Class-A, 100 watts, with 'phone permitted on 3850-3900 kc, 14150-14250 kc, 29·0-30·0 mc and 56-22000 mc.

Class-B, 50 watts CW on all bands, but 'phone on 3850-3900 kc and above 56 mc only.

Class-C, *five* watts CW only, 1750-2000 kc, 3500-3635 kc and 56-22000 mc.

No Class-A tickets have yet been issued, but all pre-war amateurs get Class-B permits automatically. The Class-C licence is for beginners and newcomers only, who have to do six months' probation under its restrictions before qualifying for Class-B facilities.

Altogether, a fair, sensible and most enlightened handling of the whole problem of amateur licensing. The number of permits now issued in Czecho-Slovakia is about 200.

THE SHORT WAVE MAGAZINE

Certificate of Merit

IT HAS BEEN DECIDED TO INTRODUCE WHAT WILL BE A NEW AWARD IN THE WORLD OF AMATEUR RADIO—THE *SHORT WAVE MAGAZINE* CERTIFICATE OF MERIT.

It will be granted in respect of any contribution to the art of Amateur Radio which, in our opinion, deserves special recognition. Awards will be made for outstanding work, either reception or transmission, in the fields of Amateur Radio operating and technique, for original contributions to the literature of Amateur Radio, and in recognition of meritorious personal service to the cause of Amateur Radio.

Any award made will be quite irrespective of the affiliations of the recipient, who may or may not be a reader of the *Magazine* or a member of this or that Amateur Radio society or organisation.

Though covering the whole field of Amateur Radio in the widest possible sense, the value of the Certificate of Merit as an award will be jealously preserved. It will be granted only in exceptional circumstances, and awards will not be made without the clearest proofs, where these may be required. The intention is not the wholesale issue of a beautiful certificate, but the serious recognition of useful work in some branch of Amateur Radio activity. While it is of course impossible to be specific on the point at this stage, we do not expect to make more than about 20 awards in a year.

Thus, though the Certificate itself will be a fine example of the printer's art, its real value will not be intrinsic but will lie in the achievement which gained it.

Certificates will carry endorsements outlining the reasons for the award, and will be in two categories of equal status, Immediate and Non-Immediate. Immediate awards will be made where the facts are sufficiently known to us as not to need proofs, and Non-Immediate awards will be those for which proofs are requested.

Certain awards in the Immediate category will be made before the November issue, in which they will be noted. For Non-Immediate awards (those for which proofs are required because the circumstances may not be known to us) readers are asked to put forward either their own claims or those of others thought to have a claim for the granting of a Certificate of Merit. The facts of the case should be outlined and if thought necessary the Editor will then call for the evidence he may want.

All awards of the *Short Wave Magazine* Certificate of Merit will be made at the absolute discretion of the Editor, assisted as necessary by expert advice or independent opinion and no award will be valid unless published in this *Magazine*.

DX COMMENTARY

ON CALLS HEARD, WORKED & QSL'd

By L. H. THOMAS, M.B.E. (G6QB)

Greetings from the new conductor—who hopes you will keep him supplied with all the news about yourselves that makes it possible to maintain the level of interest month by month. It is pure chance that the change of pilot happens to coincide with the change of policy announced last month ; please do not think that there is any personal reason for making this a feature for transmitters only—it was all arranged by the management in view of the intention to publish the *Short Wave Listener*.

From now on, therefore, this is a transmitters' feature, and so is the following collection of Calls Heard. This month we have made one departure from the rule, and have published the log of a home listener on 3·5 mc, just to show what can be done—and notice that KA when you come to it ! It is within our discretion to make such departures where the circumstances are such that an SWL report would be of direct interest to transmitters.

Talking of 3·5—poor old "eighty" ! It was obvious from the first that the new band would be popular, but we didn't quite see it becoming a replica of pre-war "Sunday mornings on Forty." By day it is full of open spaces (except on Sundays), but after dark you can't scratch the dial with a gramophone needle without hurting someone. "DX" being a relative term, we must not exclude 3·5 mc from this feature, but as yet there are no DX reports in.

Grouse-and-Grievance Dept.

The chief trouble all round continues to be the amount of high-powered 'phone occupying all parts of all bands. Even the lowest edge of 28 mc is not immune from it. We can't blame the Americans this time—their 'phone bands are officially regulated—but some of the D4's and XA's on high power are getting beyond a joke, and we have to admit that quite a lot of G 'phones have been heard at the LF ends of the bands.

Please be reasonable about this, and *please*, we repeat, do not use 'phone on the following frequencies : 3500-3635 ; 14100-14150 ; 28000-28100 kc. G5UM (St. Albans) considers that 1·7 mc also needs cleaning up in this respect, and he suggests that 'phones should keep to the 1900-2000 kc area of the band. As we now have the full range, however, it seems logical to let the 'phones roam over 1800-2000 kc and to try to preserve the LF part, 1715-1800, for the CW man. Many "CW-only" newcomers buy crystals at the LF end for harmonic use, and then find it chock-full of 'phones. They deserve a better break than that. G5UM also reminds us that the top edge, above the Loran frequency, that is to say 1970-2000 kc, is a nice little spot for 'phone work. The whole of 1900-2000 kc is underpopulated and Loran does not worry it until after dark. 'UM had two QSOs with OK in one evening during August.

Quite a lot of commercials continue to occupy the bands ; RAD still sits on about 28040, MCE merely changed his name and became DHTA2, still occupying the same place on about 14120, and three or four others have joined him. WLGO has been heard on all bands, including 1·7 mc !

There is one individual grouse in the post about "junior ops, mainly feminine, who flirt with D4's and XA's and occupy a channel for forty minutes with meaningless chatter about everything but radio." The writer says : "As an old-timer I resent this spoiling of a good hobby." So do we.

DX Century

That hardened old DX hound G2PL (Wallington) has now topped the century with 102 countries worked. G6BW (Churchill, Som.) must be a good runner-up, but we know of no one else anywhere near the hundred mark. We should be glad to hear of one or two, just to spur on G2PL (in case he needs it). Most people, in our opinion, spend far too much time calling CQ and not enough listening for new DX—but then they are not *all* searching for new ones, we suppose. There is little chance of obtaining QSL confirmation of these large scores for a very long time, unfortunately ; why is it that everyone we know QSL's 100 per cent. and

only receives about 30 per cent. back ? It doesn't make sense, somehow. By the way, G2PL sends in some nice DX QTH's, which are included in the list elsewhere in this feature. This method of presenting them should be more helpful, but it means that they will not be individually "credited" to the folks who send them in. We are none the less grateful, though, and please do not stop writing !

28 mc DX

28 has been wide open for several long periods during the month, and by "wide" we *mean* wide. It has never really died on us, of course, but there is a vast difference between those days with odd but interesting DX coming in quietly and those others with VK, ZL, W6 and all in full blast. 28 mc should supplant 14 mc as the main DX band during the coming months, and we ourselves intend to settle down to the old pre-war formula of 28 and 3·5 only (though not, as an unkind friend put it, "28 for working DX by day and 3·5 for swanking about it by night" !).

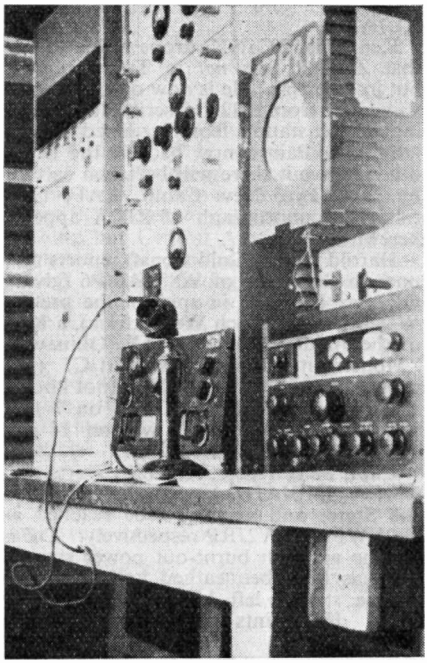
G5OO (Harrow) in pointing out that the band has never been "dead," sends us a log showing that he heard 37 countries on 28 mc between August 2 and August 16—before the "wide-open" conditions had returned. He mentions the occasional round-the-world effect on fairly local signals, and quotes the case of G5JY (Birmingham) who was heard with G5OO's beam pointing towards South America. When it was swung towards Birmingham, the signals disappeared !

There have been few other reports of 28 mc activity, although G6QB (Bexhill) found some freaks in early September, such as a W6 at midday and a VK at 1820 BST. There were also some of those days when all the W's were 5's in Texas, mostly on 'phone. Any explanation of this phenomenon will be received with interest. Other days see the band full of W4's, all in Florida.

14 mc DX

The real trouble with 28 is probably that 14 is still too good, and all the DX hounds are sticking to it like glue. Best times on 14 mc are 0900-1100 and 1600-1900. Late at night, of course, anything goes, but if you don't like QRM, keep off.

Lt. Robert Craig, that faithful contributor of G Calls Heard in the Punjab, N. India, hopes to have his VU call shortly. Though he gazes with impotent rage at HT pylons outside his back door, everything has to be battery operated, and his receiver is an Army welfare affair without bandspread. He asks for information about VU8GA, XL1AX, CJ2RA and ET3BY. (The latter was probably ET3Y in Addis Ababa). VS9AB, also queried by him, is one of the Aden contingent. Lt. Craig also reports PZ1GB (Paramaribo, Dutch Guiana), W2MMO (ship in N. Atlantic), XT3JL (Chungking) and a final "hot one" in the shape of VR2JI (Suva, Fiji). If any of the G's in his list of Calls Heard want details, drop a line and he will be pleased to send them.



General view of ZB2A, Gibraltar. *The station has five operators, and QSL's* 100 *per cent.*

G2VV (Hampton-on-Thames) points out a small misprint in last month's feature—W6VKV/16 should, of course, be W6VKV/I6. G2VV has struck a few 14 mc freaks, such as a 579 from VK at 1740 hrs, and a W5 coming in as late in the morning as 0830. He wants to see more about 28 mc in "DX Commentary." See above, OM !

G6BB (Streatham, London) is a very old timer returned to the fold. His slogan some fifteen years ago was "One of the Early Birds," and he says it is still the only way for QRP on account of 'phone QRM. With 35 watts he has worked

many W6's and 7's, VE7's, VK's and KL7AD.

Ken Ellis, ZC4NX, drops a line to say that ZC1AR was *not* in Transjordania, but in Palestine. He is now off the air.

A letter from ZB2A describes the building of the station from scrapped service gear. S/L Pain is now back in the U.K., but things out there will be taken care of by LAC Pye, New Camp, RAF, Gibraltar. A photograph of ZB2A appears herewith.

Harold Owen (Gold Coast) reports new ones in the shape of W8SIR/VP6 (giving QRA as Bermuda in spite of the prefix), W2LFI/FF8 (French West Africa), a KL7 in the Aleutians and J9AAF (Okinawa). "Monstrosities" were **W5KGI/C7** (but probably genuine) and **ZC8BP** (not known at all). He also heard **G6UJ** on 7 mc, but his main bag of G's was on 14 and appears in his Calls Heard list.

Capt. Peter Keller, XADZ, reports that XACA and XADK have both returned to the States and may now be reached as W9VWP and W2JRP respectively. 'DZ is off the air with burnt-out power supply, but has been bequeathed half-ownership of the station left behind by the other two! He points out that mail from England needs only 1½d. and QSL cards 1d.—this because he receives many cards with 2½d. or 3d. on them.

G8NI (Kenilworth, Warks.) reports an amusing QSO with UA3KAA. 'NI, with 6 watts, got a 579 report; the Russian, with 500 watts, was given a 238 in reply!

LZ1XX, by the way, is genuine. He is in Sofia, and claims to be the only active amateur in Bulgaria. Cards should go, however, *via* HB9CE or ARRL.

G2PL reports a few out-of-the-ordinary contacts, including AC3SS, YV5AB, EL4A, ZC5P, HH3L, EQ4DC, XE1CM, TI6JP, YS1X, YN1LB, G5KW/Rhodes Island, and quite a few others. He certainly gets around these days. HB9CX forwards some interesting QRA's, which appear in the box.

G6LX reports a QSO with VK9PZ, said to be on Hermit Island, off New Guinea, and wants to know if he was genuine. He also collected VE8MJ, Baffin Land.

G2CX, ex VS7CX, has now returned and will be on the air shortly from his pre-war QTH.

G3AJV queries a station signing RE1N calling CQ DX, heard only once. Any help, please?

DX FORECAST FOR OCTOBER 1946 (All times GMT)

	7 mc	14 mc	28 mc
NORTH AMERICA :			
East and Central USA, Canada, Newfoundland, etc.	2200-0700	1400-0600	1300-2000
Western States USA and Canada	0500-0800	1600-1800 0300-0700	1600-1800
CENTRAL AND SOUTH AMERICA	2100-0700	2000-0800	1000-2200
AFRICA :			
North of Cancer	All day	All day	1000-2000
South of Cancer	2000-0700	1500-2000	0900-2100
ASIA :			
West of 75° E.	1900-0400	All day	0900-1900
East of 75° E.	2200-0700	1300-2000	0900-1700
OCEANIA :			
VK and ZL	0500-0900	0800-1200 1500-2000	0900-1300
PK, KA, KG6, etc.	0000-0700	1400-1900	0900-1600

NOTE.—*The times given above are the most likely periods during which signals may be expected from the parts of the world indicated. Under unusual conditions, signals may be heard outside these times.*

One of the rarer DX stations, VS4JH on Labuan. *In spite of the remoteness of the locality, he has an AR-88 receiver, a crystal microphone and a rack-built transmitter assembly!*

G6QB contributes a few "hot ones," in the shape of ZK1AB (Cook Is.), 14040; K6HOT/KC6, Canton Is., 14095; W6VDG/KW6, Wake Is., 14170; VK4OS, Papua, 14100, and small fry such as FM8AC (Martinique), EL5B, W7GBL/J2, W7AKR/KG6. Several Tasmanians have now emerged, the best being VK7LJ and VK7NC. On the date of writing a Mexican—XE1NE—was heard at 1045 BST—about 14100. The VK's and ZL's on 14 mc now seem to peak at about 0930 BST or even later.

Miscellany

There is a regular old-timers' parade on 3·5 mc nowadays; such real old ones as G2AX, G2NM, G2VQ, G6NF, G5KG, G6UJ, G6GL have all been heard frequently. . . . . Several correspondents ask how long this short-skip business will last on 14—practically every DX QSO suffers from "CQ tvanty-meeders fun" from Italy or somewhere. . . . . G2HLF has been working stacks of W's in the early mornings on 7 mc. . . . . Piracy is rife again! G6QB worked PAØKU on 3·5 mc phone and said "psed cuagn," having worked him the previous day on CW, but not, apparently, the same station! . . . . Jan Kuchar, OK2HK, reports that his call is being regularly pirated. . . . . G2HLL very much wants reports on his 1823 kc transmissions, using 3 watts from dry batteries. Anything from distances greater than 30 miles from Leeds will be welcome. . . . . G6NC, ex-VS6AH, is on from Bridgwater, driving a nice bug-key. . . . .G. Denby, out in Palestine, reports a marked increase in G activity on 14 mc, and mentions the excellent 'phone transmissions of G2BU, G2PU and G3FA . . . . He is still trying to hear us on 1·7 mc.

Reports for November by October 18 *latest*, please.

Foot-Note

The 28 and 14 mc bands started behaving in a very unusual manner on September 16. First evidence of it was a sudden "W6 party" on 28—every signal heard, both 'phone and CW, was a W6 from 1750 until about 1850, when they all faded out, leaving nothing but Central Americans. 14 mc, the same night, produced a crop of weak watery signals, among them ZS6DO at midnight, and the only loud, clear signals were EL5B, EL1AZ and CN8MZ—all in North Africa.

The following morning on 14 mc, instead of the usual VK's and ZL's, there were four Alaskans coming in at S8-9 and very little else. By the morning of the 18th the ZL's were coming through again, but very weak and watery. This probably precedes a characteristic sun-spot fade-out,* but looks very interesting.

** A violent display of Aurora Borealis and what the Press called a "disruption of Trans-Atlantic radio communications" occurred on September 19.—Ed.*

Y' KIND ATTENTION, PLEASE!

G6QB becomes the new contributor of "DX Commentary," starting with this issue.

As already announced, our new companion publication, "The Short Wave Listener," is to edge into view on October 17. It is proposed that SWL reports discussing DX on the amateur bands be covered by the DX Scribe (of pre-war Magazine fame) in his "Have You Heard . . .?" in the new paper. All those SWL readers who have for so long supported "DX Commentary" here are asked to address their future correspondence and calls heard lists to the DX Scribe, who will be able to give them more space in the "Short Wave Listener." Mail for his "Have You Heard . . .?" articles should reach him by the 5th of each month, addressed The DX Scribe, c/o "The Short Wave Listener," 49 Victoria Street, London, S.W.1.

As to "DX Commentary" in the Magazine, it is intended that it should cover amateur band DX working from the point of view only of the holder of a full callsign. No SWL reports will in future be included in "DX Commentary, unless they are of direct interest to transmitters.

Transmitting readers are asked to send items for this column to L. H. Thomas, G6QB, c/o "The Short Wave Magazine," 49 Victoria Street, London, S.W.1, to reach him as early as possible in the month.

DX QTH's

CO2BA	Box 1049, Havana.
EA9AI	Dr. Mora, Melilla, Spanish Morocco.
EK1AZ	British Post Office, Tangier Zone.
EL5B	APO 605, c/o P'master, Miami, Florida.
GMYS/VU2	R. Thorn, Trent Maritime, c/o Bevis Marks House, London.
KH6CT	Box 237, Lanikai, Hawaii.
KL7AD	C/o C.A.A., Tanacross, Alaska.
KZ5AD	APO 825, c/o Postmaster, N.Y.C. (station at Allbrook Field, Canal Zone).
PJ3X	J. P. Daudey, c/o AMC, Curacao, Dutch West Indies.
PK1RW	L/Cpl. Webb, 110 M. W/T Sect., 15 Ind. Corps, Batavia, SEAC.
PK5LK	Balikpapan, Dutch Borneo.
PK6AW	Sgt. Bob Westerveld, Dutch A.F., Biak Is., Dutch New Guinea.
PZ1FM	Box 118, Paramaribo, Dutch Guiana.
VS2BA	Sigs. Sect., AHQ RAF Malaya, S.E. Asia A.F.
VS2BF	Officers' Mess, Kuala Lumpur, Malaya Comd. Sigs., SEAC.
VS7ES	5 Elibank Road, Colombo, Ceylon.
W2LFI/FF8	Frank Petrucci, Pan-American Air Lines, Dakar, F.W.A.
XE1AC	Box 9581, Mexico City.
XE1CQ	Box 907, Mexico City.

PITCAIRN—VR6AY

Many pre-war readers, transmitters and listeners, will remember the famous VR6AY, operated by Andrew Young (genuine *Bounty* descendant) on Pitcairn Island, in the far South Pacific.

It is possible that VR6AY will soon appear once again on 14 mc. A transmitter is available, and Andrew Young himself has gained much further radio knowledge and experience by reason of the fact that, with ZL2FR, he maintained an official station on Pitcairn during the war years. Working or hearing VR6AY will be one thing—the trick will be to get the QSL. The mail service is by chance, and before the war it was nothing for the wretched Andrew to get a thousand cards at a time when a ship did call at the Island !

★ ★ ★

POINT FOR CORRESPONDENTS

We now receive a very large and most welcome mail, which is cleared with the least possible delay. As mentioned some months ago, it would be a great help in the systematic and expeditious handling of mail if correspondents would be careful to address each department on a separate sheet, with name, address and callsign (if any) on every sheet.

It is still not possible for us to achieve a " by-return " standard on all correspondence, and the replies which are delayed most are those to letters —to take a recent example—containing a new QRA (QRA Section), an enquiry about back numbers (Circulation Manager), a small advertisement (Advertisement Manager), some interesting gossip (Editor), a DX log (Calls Heard), and a request for a Club notice (Club Secretary)—all on two sides of a typed foolscap sheet ! Our only objection to letters of this kind is that they have to be passed round and round and round before they can be filed away (under heading " Miscellaneous "). Six separate notes are obviously so much more helpful!

CALLS HEARD

Please arrange all logs strictly in the form given here, in numerical and alphabetical order and on separate sheets under appropriate band headings, with callsign or SWL number and address on each sheet.

FIVE METRES

G2XC, 34 London Road, Widley, Portsmouth, Hants.

Worked: G2AK (120), 2DZT, 2MR, 2MV, 2QV (67), 2VH, 2WS, 3CQ (72), 3OO (65), 4CI, 4IG, 4QL, 5AS, 5IG (105), 5LI, 5MA, 5MQ (190), 5TX, 6DH, (116), 6KB, 6LK, 6OH, 6UH, 6VX, 6YU (105), 8BD, 8GX, 8KZ, 8OS, 8QW/A, 8RS, 8SK, 8WC.
Heard: G5BY (130), 8UZ (156). *All between August* 16-*September* 13. *DX distances in brackets.*

G5UM, 9 Windermere Avenue, St. Albans, Herts.
'Phone: G2CIN, 3OO, 6VX, 8KZ. ***CW:*** G2MR, 2UJ, 2WS, 2YL, 5MA, 6LK, 6NR. *September* 8-15, *on "All-EF5O" TRF Receiver.*

G. Elliott, B.Sc., 46 Shaftesbury Road, Gosport, Hants.

'Phone: G2BMZ (112), 5BY (129), 5MA (62), 6LK (45), I1MH. ***CW:*** G2MV (69), G3SU (29), 5OJ (47), 6VX (80), 8OS (36).

G6YU, 14 Bourne Road, Copsewood, Coventry, Warks.

Worked: G2AK, 2BMZ, 2MR, 2NH, 2XC, 2ZV, 3ABA, 3IS, 3YO, 4CI, 4IG, 5LJ, 5MA, 5TX, 5WP, 6CW, 6LK, 6SL, 6VX, 6YQ, 8GX, 8LH, 8QY, 8UZ, 8VN, F3JB, I1FA. ***Heard:*** G2NV, 5JU, 5MQ, F8BC, 8RSN.

G5BY, Resthaven Hotel, Thurlestone, Nr. Kingsbridge, S. Devon.

Worked: F8RSN, G2MR, 5MA, 5MQ, 6KB, 6LK, 8RS, HB9BZ, 9CD, 9J, I1FA, I1RA, 1KS, 1MH, 1TH. *August* 18-*September* 17.

OVERSEAS—GENERAL

14 mc CW and 'Phone

Harold Owen, B.Sc., West African Cacao Research Institute, P.O. Box 8, Tafo, Gold Coast Colony.

G2AJ (56), 2AMG (43), 2ATK (33), 2BJW (44), 2BRO (458), 2BXP (43), 2BY (567), 2CLL (44), 2COP (55), 2FGX (448), 2FHV (43), 2FMT (21), 2FQP (43), 2FXQ (54), 2HD (55), 2IO (54), 2IQ (558), 2KG (337), 2LU (54), 2NA (44), 2OC (43), 2OS (44), 2QO (46), 2SY (55), 2UK (33), 2VD (558), 2VV (55), 2YH (458), 2ZA (557), 3BW (42), 3DT (44), 3FA (55), 3HK (45), 3KP (54), 3MZ (55), 3OT (55), 3PJ (43), 3QD (54), 3RQ (44), 3VA (32), 4AK (55), 4IN (54), 4MU (44), 5AC (548), 5BJ (56), 5CV (54), 5DQ (447), 5HB (44) 5IK (458), 5LI (55), 5LP (56), 5MY (55), 5OB (34), 5PR (44), 5QA (56), 5RV (55), 5UI (43), 5UX (54), 5VB (547), 5VM (56), 5WG (54), 5WQ (44), 5XV (44), 6AH (44), 6CL (54), 6FW (44), 6GM (44), 6HB (548), 6IM (44), 6JF (55), 6KP (44), 6QN (44), 6RC (34), 6RS (34), 6UT (55), 6XR (45), 6ZO (43), 8BP (44), 8FV (55), 8GO (43), 8HH (458), 8IH (44), 8ON (44), 8PO (45), 8PS (54), 8QH (578), 8TI (44), 8VB (55), 8VG (43), 8WL (54), 8WV (55), GM2DI (44), 3RL (54), 3UM (555), 4HR (56), 5PY (45), 6KH (55), 8SQ (44), GW3VL (557), 5VX (44), 6AA (54). (*RS values in brackets.*) *July* 31-*August* 23.

G. Denby, 3 Sqdn., Palestine Command, Signals Regt., M.E.L.F.

CW: G2AIX, 2AS, 2CCN, 2CIX, 2CLL, 2FCL, 2FGX, 2FQH, 2FZO, 2HAO, 2OS, 2VK, 2XB, 2XD, 3BU, 3IV, 3YF, 4CP, 4DQ, 4IN, 5DQ, 5IK, 5RV, 6PA, 8AG, 8GB, 8GO, 8JJ, 8TI, 8UG, 8UR, GI5UW, GM2FV, 2FXN, 2LQ.
'Phone: G2AJ, 2BU, 2BZ, 2PU, 3BM, 3BK, 3FA, 3HV, 3MI, 3MK, 3MR, 4BD, 4HD, 6XR, 8AP, 8AW, 8KP, 8UR, GM2DI, 4II, 8NW. *All received August* 14-*September* 12.

1·7 and 3·5 mc CW

OK1AW, Alois Weirauch, Mestec Kralove 9, Czechoslovakia.

1·7 mc CW

G2OU, 3HT, 3NT, 3TK, 4FN, 4IC, 6LD.

3·5 mc CW

G2QN, 3AKF, 6ZY, GM5SL.

14 mc 'Phone

XADZ, Capt. Peter Keller, British Army, A5, G.H.Q., C.M.F. (Caserta, Italy).

G3HZ (55), 3MK (55), 5OO (55), 5XA (55), 6AG (957), 6BY (56), 6XR (57), GW3AX (55), 3XY (55). *All heard* 1900-2300 *GMT August* 17.

Lt. Robert S. Craig, 10th Gurkha Rifles, Alhilal Camp, Kangra Valley, Punjab, India Command.

G2AJ, 2IG, 2MF, 2PU, 2ZB, 3BM, 3HJ, 3HZ, 3MK, 3OZ, 3RI, 4KG, 4MS, 5MY, 5OV, 5VC, 6XR, 8LP, 8MO, 8MX, 8QW, GM8MW, GW3UG, 4FU, 5BW, 5XN.

GENERAL

3·5 mc

John Hall, 21 Howberry Road, Thornton Heath, Surrey.

VE1EA, 1HO, 1IA, 1JV, 1LZ, 1NY, 1PX, 1PY, 1QH, 1QI, 1QL, 1QT, 1RB, 1SY, 2HW, 2LZ, 2MP, 3ATM, 3AYE, 3HP, VO8AR, W5AUZ, KA1CM, KP4AE, KS5AA, KZ5AD and over 200 W's in Districts 1-4 and 8.

Simple CO-PA

Further Notes on August's 6V6-6L6 Design

On pp. 352-354 of the August issue of the *Magazine*, a practical CO-PA design was given under the title "Two Valve Job for 160 Metres."

Based on this design, with all details as given in the article, a *Magazine* model using the 6V6-6L6 combination has been on air test since the August issue appeared. The results obtained with this transmitter certainly more than bear out the author's claims for the original design.

It is simple, effective and, what is more important for the beginner, our American friends would describe it as "sure-fire." Simply plug in the crystal, bring the PA to resonance, tune up the aerial, and off you go. The question of neutralising does not arise, and no screening is required between stages.

The aerial coupler we are using is that described on p. 350 of the same issue—"Multi-Band Aerial System"—which is another sure performer.

Operation on 3·5 mc

The present intention is to explain how this same transmitter can be used on other bands; G6KR's article described its operation on 1·7 mc only.

By using a tank coil L and condenser C5 (see circuit diagram p. 353, August) of 35 turns 2½-in. in diameter, slightly spaced, and tuned with ·0003 μF for C5, both 1·7 and 3·5 mc can be covered in the same tank circuit, with reasonable L/C ratios in each case. The top band will of course be found near the maximum setting of C5 and 3·5 mc towards the minimum capacity end. It is then only a matter of plugging crystals to change from band to band.

7 mc Working

The circuit will perform equally well on 7 mc, using the appropriate crystal and a 10-turn coil of the same diameter for L, the tuning capacity C5 remaining as before.

Keying

Grid-block keying with a bias voltage of 120 (all of a nominal 120-volt HT block) is used in our case, to the circuit which appears on p. 155 of the May issue of the *Magazine*. This gives a good T9 note, but watch the loading on the PA, or it will tend to become chirpy. Having set up the transmitter on the desired band, monitor the signal and adjust the aerial coupling until the note is clean and sharp.

Power Input

On 1·7 mc, we use 280 volts on the HT+ lead (see circuit again), drawing about 35 mA in the 6L6 from a no-load minimum of 10 mA.

On 3·5 mc, the HT voltage is increased to 380 volts, and 40 mA load (15 watts) taken from a no-load minimum of about 12 mA. On 7 mc, similar conditions apply, except that the no-load PA plate current is rather higher.

The results on 1·7 and 3·5 mc have been quite consistent, and most satisfactory in view of the power used, though it must be borne in mind that the transmitter is being operated from a good country location; not much time has, however, been spent on 7 mc due to the chaotic condition of that band, but a few excellent test contacts have been made.

Since grid-block keying, in this particular circuit, will produce a standing current in the PA during open-key periods, either increase the PA biasing cathode-resistor R7 to 750 ohms, or return R5 to the blocking-bias line. In the former case, the standing current will be reduced to about 35 mA and in the latter to zero.

Developing the Design

Our model occupies only 6½-in. by 7-in. on an aluminium chassis with a 1-in. subspace. Various refinements are in mind, such as incorporated power supply, auxiliary grid modulation on the 6L6 (to G4HM's design, as described in the July issue of the *Magazine*) and the use of the Brookes' switching unit for the selection of crystals for the three bands. All this could easily be accommodated on a standard 17-in. by 10-in. by 1-in. chassis.

Apart altogether from these points, the transmitter as it stands would make an excellent exciter for a higher-powered outfit.

Its immediate value and merit is as a sound beginner (or stand-by QRP) design for the LF bands.

The R.A.F. T.1154 Transmitter

Some General Notes

(The T.1154 is a relatively high-power aircraft transmitter and, in the Service application, it is integral with the R.1155 receiver to make a complete installation. The T.1154 was the first band-switched spot-frequency airborne communications transmitter to be seen in the R.A.F. and fitting to aircraft of Bomber Command began early in 1941. *The* T.1154/R.1155 *combination is still standard equipment in heavy aircraft carrying a wireless operator as a crew member.—Ed.)*

The information given in this article is published by authority.

The photograph on p. 501 gives a good impression of the T.1154, which is a 100-watt CW/'Phone transmitter, using an MO-PA arrangement—an ML6 driving a pair of PT15's in parallel. The frequency coverage is in three ranges: 10-5·5 mc, 5·5-3·0 mc, and 500-200 kc.

At the 'phone position, provision is made for operation with either a carbon or an electro-magnetic microphone. Suppressor-grid modulation is used, with a second ML6 as modulator, and there is a side-tone circuit for CW monitoring.

Frequency Setting

Each tuning range has its own coil-condenser assembly on both MO and PA sides and on all three ranges, which are selected by means of switching. Any desired frequency in the range selected, up to a total of eight, can be pre-set by an ingenious click-stop mechanism which locks the dial at a particular setting.

In the air, the transmitter is adjusted to frequency either by " back-tuning " to the ground station it is desired to work or by the use of a crystal-controlled monitor carried in the aircraft and supplied with crystals for the frequencies required.

Aerial Coupling

The aerial coupling as fitted is direct and is designed to be used either with the aircraft fixed aerial or the usual trailing aerial, which on the HF bands can be run out to a length to match the frequency .

At a ground (amateur) station, the aerial output could be taken to any type of transmitting aerial *via* a suitable matching network.

Apart from the wave-range selection and tuning, the T.1154 is entirely relay controlled, with automatic change-over in combination with the R.1155 receiver. Two panel meters are fitted, reading 0-300 mA for plate and 0-3·5 amps for aerial current.

The equipment is extremely ruggedly built and is shock-mounted to withstand the inevitable rough usage involved in aircraft working. Unit construction has been adopted and the various elements of the transmitter are on separate chassis.

Power Supply

In the air, power at 1250 volts HT and 6 volts LT is obtained from motor-generators operated off the aircraft 24-volt DC line. One of these two generators is double-wound to give LT for the transmitter and R.1155 receiver, as well as HT for the latter.

The inter-connection between the units —transmitter, receiver, power generators and control system—involves a good deal of complicated wiring and the use of a starter control for ensuring that LT is fully applied to the transmitter before HT is switched on.

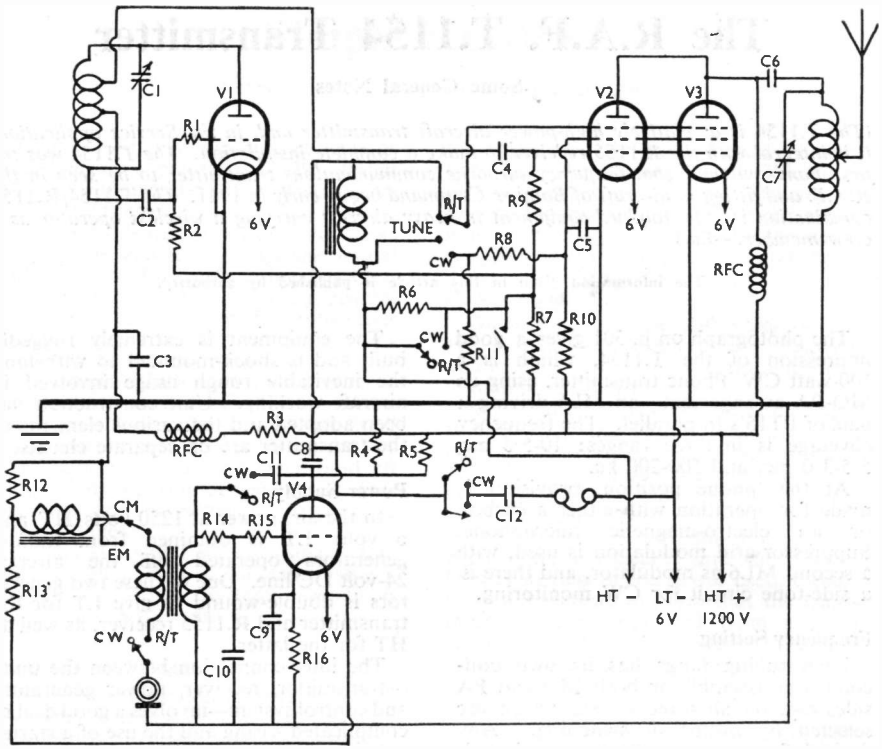
Instruction Manual

There is not the space here to discuss all these points in detail ; the Service manual describing the installation contains on the T.1154 alone some 24 quarto pages of instructions and warnings, with numerous illustrations and tables and two double-page detail wiring and circuit diagrams. Indeed, this manual is a model of its kind, containing all the information which could possibly be required on the construction, operation and maintenance of the whole installation.

Amateur Operation

Many of these transmitters are reaching amateur hands. Whether that is a good thing is perhaps a matter of opinion, for, as we see it, the T.1154 is not really suitable for amateur use without considerable modification.

It is too high-powered (except in the hands of an experienced amateur operator



Circuit diagram of the essentials of the T.1154 aircraft transmitter. *The arrangement is MO-PA, with suppressor-grid modulation, the modulator valve V4 also being used to generate MCW tone and, on CW, keying side-tone. V1, V4,* are *ML6's, and the paralleled PA valves V2, V3, are PT15's. The transmitter is relay controlled, and the apparent complication of the circuit is mainly due to the MCW and side-tone features and to the fact that in the Service application the Tx is interconnected with the receiver* R.1155 *to form a complete installation. The only amateur bands covered by the standard tuning are 7 and 3·5 mc. Frequencies can be set up by a click-stop mechanism, and switched wave-change is provided. For simplicity, the separate tuned circuits used for each band have been omitted from the circuit diagram. The master-oscillator will drive the paralleled PT15's to about* 100 *watts input on all bands, with* 1,000-1,250 *volts on the plate.*

Table of Values—T.1154 Transmitter

C1, C2	= 150 $\mu\mu$F	R1	= 51 ohms
C3, C5	= ·005 μF	R2	= 15,000 ohms
C4, C10	= 200 $\mu\mu$F	R3	= 50,000 ohms
C6	= ·004 μF	R4, R5	= 75,000 ohms
C7	= 205 $\mu\mu$F	R6	= 350 ohms
C8	= 0·25μF	R7	= 5,000 ohms
C9	= ·01μF	R8	= 12,000 ohms
C11	= 50 $\mu\mu$F	R9, R10	= 20,000 ohms
C12	= ·001 μF	R11	= 2,000 ohms
CM	= Carbon microphone	R12	= 6 ohms
EM	= Electro-magnetic micro-phone	R13	= 10 ohms
		R14	= 650 ohms
V1, V4	= ML6	R15	= 7,500 ohms
V2, V3	= PT15	R16	= 800 ohms

who, in any case, would not use equipment of this kind), it covers only two amateur bands (7 and 3·5 mc), it requires careful adjustment to produce a really good signal, the aerial coupling arrangement is both dangerous and unsatisfactory (though this could be altered), a good frequency standard is absolutely essential for the correct setting up of the transmitter, and the provision of a suitable power supply is awkward (1250 volts at 250 mA, and 6 volts DC at 4-6 amps for LT).

Nevertheless, the transmitter has several attractive features and contains some very useful components. Our advice to those who may contemplate the purchase of one of these sets is that they demand a copy of the accompanying instruction manual (one of these goes with each new equipment supplied to the Service) from the trader who offers the transmitter, as without this manual it will be difficult to get the set into operation.

The tendency recently has been for people to buy the set first and then to write *us* demanding answers "by return, please" to vague general questions as to how to get it working—hence this note ! With the best will in the world we cannot (for the present, at least) reproduce the mass of data contained in the instruction manual, nor do we see any reason why the dealers who profit by the sale of these sets should not have to answer the questions about them !

There is a moral in this, by the way.

The Editor Wants

★ Photographs with Notes for the "Other Man's Station" series.

★ Photographs of Equipment of Amateur Radio interest, home and overseas.

★ Photographs of Club Meetings.

All material accepted for publication is paid for on appearance. Photographs must be clear and sharp, but can be any size, and either print or negative.

NEW QRA's

*Only **those** which have changed since the appearance of the September, 1939, issue of the Call Book or **were not** included in it for fully licensed operation, or are now licensed for the first time, can be published here. All that do appear in this column will automatically be included in the next Call Book, now in preparation. The number of QRAs we can print each month depends upon space available. QRAs are inserted as they are received, up to the limit of the space allowance. Please **write clearly** and address to QRA Section.*

EI4Q Rev. Fr. J. A. Stone, 39 Booterstown Avenue, Blackrock, Co. Dublin, Eire.

G2AJV R. C. Jennison, 28 Park Drive, Grimsby, Lincs.

GW2AVV G. E. Evans, B.Sc., A.M.I.E.E., Flatholm, Royal Buildings, Port Talbot, Glam.

G2BGG J. Garner, Barbon, Aigburth Hall Road, Liverpool,19. (*Tel.: GARston* 1903.)

G2CDT F. H. Martin, 22 Walders Avenue, Wadsley, Sheffield,6.

G2DUD H. Worsley, 8 Hall Grove, Cheadle, Cheshire.

G2DVF F. G. Antervie, 19 Norley Avenue, Stretford, Lancs.

G2DXK L. Knight, 132 Norton Road, Stotfold, Beds.

GW2FRB E. Naish, 46 Brook Street, Taibach, Port Talbot, Glam.

G2HLL F. H. Pickard, Stonegate Farm, Meanwood, Leeds, 6, Yorks.

G2QX A. E. Groom, 19 Woodland Avenue, Luton, Beds.

G3AAH L. Allen, 14 Frampton Close, Bournville, Birmingham, 30.

G3ABM H. E. Bull, 6 Brooklyn Drive, Ellesmere Port, Cheshire.

GM3ACD C. N. R. Ross, The Braes, Kincardine-on-Forth, Fife, Scotland.

GW3ACF A. J. Glassford, 4 Wood Street, Margam, Port Talbot, Glam.

G3ACU E. H. Pearson, 23 Alwyne Mansions, Wimbledon, London, S.W.19.

G3ADA W. Swanston, 24 Chapel Street, Eyemouth, Berwick.

G3ADX E. C. Jenkins, 72 Milton Road, Weston-super-Mare, Somerset.

G3AFI T. M. Trotter, Flat 3, 13 The Cross, Oswestry, Salop.

G3AGD A. L. Drakeford, Arkley Hotel, Barnet, Herts.

G3AGH R. Carpenter, 120 Hedge Lane, London, N.13.

G3AGL M. M. D'Arcy, 27 Theydon Grove, Woodford Green, Essex.

G3AGP T. J. Barns, 73 Torrington Way, Morden, Surrey.

G3AGQ R. C. Eldridge, 10 Westridge Road, Southampton, Hants.

G3AHJ K. W. Lawson, 24 Heaton Road, Heaton Norris, Stockport, Cheshire.

G3AHO C. Finch, 6 Lowden Road, Herne Hill, London, S.E.24.

GM3AHQ J. S. Stewart, A.B.I.R.E., 1 Beech Avenue, Bearsden, Dumbartonshire, Scotland. (*Tel: Bearsden* 3222.)

G3AHT J. C. Park, 15 Oswald Road, Oswestry, Salop.

G3AHU J. L. Monk, 14 Angell Road, Brixton, London, S.W.9.

G3AIA H. G. Cundall, 21 Milner Road, Ravensbury Park, Morden, Surrey. (*Tel.: MITcham* 3307.)

G3AIG T. G. Dickinson, 6 Temple Gardens, Golders Green, London, N.W.11.

G3AJQ A. H. Crossland, 35 Keeling Road, Cheadle, Stoke-on-Trent, Staffs.

G3ARM R. Ramsey, Rock Hill, Sydney Road, Guildford, Surrey.

GW3GO S. Waters, Radio Relay Station, Kenfig Hill, Glam.

G3TO A. R. Donald, 186 Stockton Road, West Hartlepool, Co. Durham.

G3YK G. A. Kenyon, 32 Emerson Avenue, Middlesbrough, Yorks.

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

G5CX C. R. Pill, 22 Alcester Road, Bromsgrove, Worcs.

G5IH Commander (L.) G. C. Turner, R.N., c/o Westminster Bank, Ltd., Mount Ephraim, Tunbridge Wells, Kent.

G5IW F. E. Barlow, Drakeford, Poolhead Lane, Wood End, Tanworth-in-Arden, Warks.

G5MR V. G. Mellor, M.A., South Lawn, Admiralty Road, Felpham, Bognor Regis, Sussex.

G5RZ A. G. Wood, Holmeside, Heath Road, Leighton Buzzard, Beds. (*Tel: Heath & Reach* 5.)

G5SI A. Wood, 7 Burcott Gardens, Addlestone, Surrey.

GW5VX A. C. Willams, 14 Holland Street, Port Talbot, Glam.

G5WC N. Vaus, Upper Maisonette, 101 Central Hill, Upper Norwood, London, S. E.19.

GM6JJ W. N. Craig, 2 Aberdour Road, Burntisland, Fife, Scotland.

G6NV A. Hargreaves, 5 Ridge Street, Barnoldswick, via Colne, Lancs.

G8FA E. J. Napier, 8 Fore Street, Teignmouth, S. Devon.

G8FJ H. S. Norris, G.I.E.E., 7 Kingshill Crescent, St Albans, Herts.

G8VG Capt. W. H. Windle, 121 Laburnum Avenue, Dartford, Kent.

Here and There

The Call Book

The second post-war (Fall) issue of the Radio Amateur Call Book became available in the States about September 15, so that first consignments should reach this country very shortly. The new cover price of the Call Book is $1.70, or 8s. 3d. at the prevailing dollar rate. The annual subscription (four issues) is $6.00, or 29s. Published by the Radio Amateur Call Book, Inc., 608 South Dearborn Street, Chicago, Illinois, U.S.A., it can be obtained as explained in the notes which appeared on p. 248, June, and p. 308, July, and as advertised from time to time in this *Magazine*.

It is of sufficient interest to add that the Summer 1946 Edition (the first post-war issue) contains seven pages of G calls, which include those that appeared in our "New QRA" lists as far as the May issue. The new edition should take these particular listings two months further forward.

Greek Calls

It is probable that by the time this appears in print, Service users of the XA prefix in Greece will be issued with authentic SV callsigns in the SV1AA-SV1AZ and SV2AA-SV2AZ series, allotted by the British military authority. The issue of licences to Greek nationals is a matter for their Government, and is understood to be under consideration at the moment.

Staff Note

Readers will be interested to know that L. H. Thomas, M.B.E. (G6QB) has been appointed Assistant Editor of the *Short Wave Magazine* and *Short Wave Listener*, to take effect from October 1. He will assume responsibility for certain features in both publications.

One of the regular contributors to the *Magazine* since our resumption of activity last March, he will also be well known as a writer for several radio periodicals in the pre-war era. Licensed as G6QB as long ago as 1924, and constantly active ever since, he has had great experience of the practice of Amateur Radio. He is the third member of our executive staff who is an ex-R.A.F. officer.

Eddystone Gear

Messrs. Stratton & Co., of Birmingham, manufacturers of "Eddystone" components, are now appointing agents in various parts of the country. Readers can obtain the name of their nearest dealer by writing to Stratton & Co., Eddystone Works, Alvechurch Road, West Heath, Birmingham, 31.

Do You Know That

When using the grounded-grid technique, inter-stage RF coupling can be obtained simply by putting a link coil in series with the cathode of the driven valve? This link is coupled to the buffer or driver stage in the usual way and will excite the driven valve almost as effectively as if a tuned circuit were being used in the cathode. An output stage driven in this manner operates as a triode with only one tuned circuit (the output tank) and requires no neutralisation.

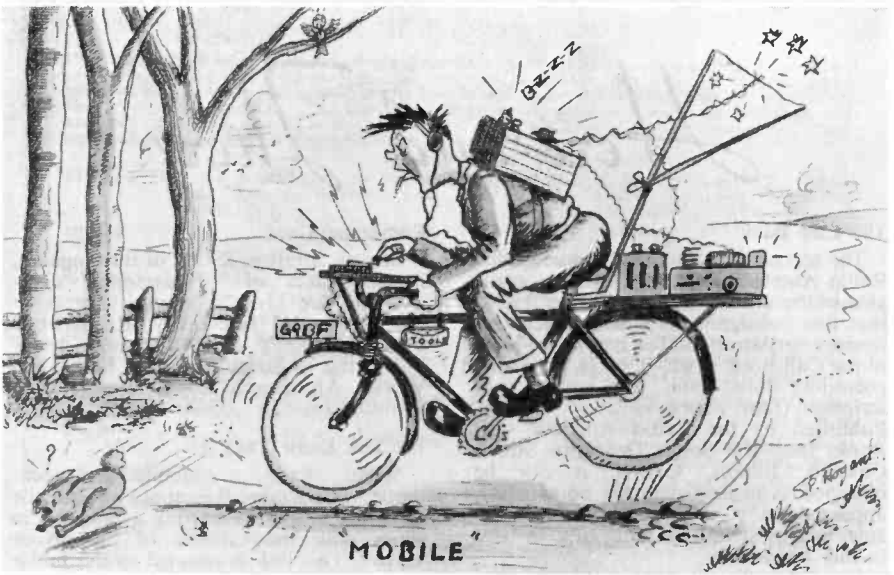
VK Frequency Allocations

On September 1, the 3500-3800 kc band was reopened to the Australians. On 40 metres, however, they only have 50 kc! The 14 mc band is crowded to suffocation, and G's are difficult to work through the QRM. The bright spot is the 166-170 mc band, which is giving the VK's who use it results as good as they get on their 50-54 mc band.

Publication

Our first 32-page reprint booklet, "The Principles of Short Wave Reception," is now on sale at 1s. 6d., and should be obtainable at bookstalls and news-stands throughout the country. The original articles appeared this year in the March, April and May issues of the *Magazine* (now out of print), though some of the material is reprinted from the pre-war series.

If a newsagent does not carry stocks, supplies can be obtained in the usual way through normal trade channels. Alternatively, reader copies are available at 1s. 8d. post free from us at 49 Victoria Street, London, S.W.1. But ask your newsagent first.



G9BF Calling

(*Yes, we know he wastes space, but the stuff costs nothing.—Ed.*)

In view huge success my DX advice, have decided contribute one my real *technical* articles this time. Editor raising usual objections, saying G9BF fan-mail (long letter from G explaining how obtain real super-DX note, several phoney QSL's and my foreign p.c.) now wasting too much office time. This attitude only jealousy of course as Editor's fan-mail reduced insignificant proportions due immense popularity KZ7LX. This of course is me G9BF.

Station G9BF naturally conforms best technical standard. Max possible power used irrespective conditions, band or range of QSO. This ensures consistent results for which I am famous. On principle PA stage always working best when plate red-hot, keep my T20 at maximum drive, heaviest load and highest available HT. In order obtain regenerative effect (this technique not understood by most amateurs) do not bother with neuting. Hence valve always working full efficiency, key up or down, and radiating plenty heat to keep shack warm and dry. No other writer ever before covered this important point.

This system not too satisfactory for BKS, agreed, as RX noisy due PA hard at work 100% time, but easily overcome this by cutting HT at Tx power pack when using BK. Can always explain delay in coming over by saying "Sri OM but QRM ur freq did not hr ur BK." This sounds *efficient*.

Have now designed motor-controlled tuning mechanism, using ½-h.p. motor to tune all Tx circuits *simultaneously*. At present bothered by heavy loading motor (fuses fizz on starting) and *very* rapid tuning motion when motor gets away. Tuning swept right out of band before have time stop motor ; designing special brake for this, controlled by lever at Rx position. Elements design obviously sound and only small details like smooth control, steady adjustment, tracking Tx circuits and dead-beat motor action now require attention—matter of half-hour's work when time available.

Readers will agree my famous station well in forefront technical progress Amateur Radio. "Advice to beginners freely given and DX worked to order" is motto at G9BF. Feel certain I will be first holder Certificate of Merit in view my splendid record service to cause.

(*We rather doubt this.—Ed.*)

THE MONTH WITH THE CLUBS

FROM REPORTS

Without exception, those readers and Club secretaries who have commented approve of the new layout of this section. We are glad about this, as it is a great space-saver and with no less than 30 reports (a record) on the hook for this month, we need all the room we can make for the Clubs.

The Editor has renewed his promise to accommodate all Club reports received by the due date, and if the need arises, is prepared to think up another scheme for saving space!

One interesting suggestion made this month is contained in a remark in one of the northern reports "Why not an Association of Clubs?" Why not, indeed. As a matter of fact, we have had ideas along these lines from the beginning! How many Clubs are interested in such a proposal? We leave it at that for the moment.

The Inter-Club Contest

So far, four Clubs have nominated for the proposed 1·7 mc transmitting contest—see this space last month—and several others will have taken the vote by the time this appears. Remember, the closing date for entries is October 10 (within about a week of seeing this) and the rules will be circulated to all concerned before they are published here in the November issue, with the final list of entrants.

A suggestion is that where Clubs do not possess their own licence, they should be allowed to nominate one of their member stations as the Club entrant. It is not quite what we had in mind, but as three secretaries have made the same suggestion, we have no objections and are prepared to accept such entries. Clubs in this category can be given till October 17 *latest* to put in their entries, as we anticipate that a little time will be necessary to arrange matters among the membership.

November Closing Date

Having forgotten this important point last month, the closing date for copy for the November issue is October 17 *certain*, which means posting on the 15th in many cases. Address "Club Secretary," *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1.

Herewith the reports—and by the way, a welcome to Aberdeen, Stroud and Wigan, newcomers to the fold. Good luck, and we hope to hear of your doings regularly from now on.

Secretaries' QTH's in the panel at the end, as usual.

Wanstead & Woodford Radio Society.—This is a slight change of name for the old Woodford society. Meetings are every Tuesday, 7.30 p.m., at Wanstead House. New members are welcome.

Aberdeen Amateur Radio Society.—This is a new formation and applications for membership are invited—secretary's name and address in the appropriate space.

Slade Radio.—They are completing arrangements for a portable licence, with a view to doing some D/F work on 1·7 mc before the weather finally makes it impossible. Membership is on the increase here, too, and they look forward to a successful season. An interesting meeting on telearchics will be held on October 25, when a joint discussion takes place with the Model Aero Club.

Cheltenham & District Amateur Radio Society.—Their first D/F field day was such a success that another was held on September 29, using a vibrator power supply to put 10 watts into a 6L6. The input used on the first occasion was much lower—the HT being a 120-volt battery—which made it hard going for some of the younger members with their one-lung Rx's. In spite of the weather, 30 members took part in the first event, and G8DA/P was found by a car party ten minutes before the QRT; a cycle party led by G3LP was only a few hundred yards away. If anyone outside the Cheltenham district heard G3LP/P on September 29, it was the second field day, and reports on the signals would be welcome.

Wigan & District Amateur Radio Club.—This is a newly formed club, membership of which is open only to those interested in Amateur Radio. They meet every Thursday at 8.0 p.m. at 30 Darlington Street, and prospective members are asked either to get in touch with the secretary or to call in at the meetings.

Stroud & District Amateur Radio Club.—Having closed for the war, the Club reformed in April last. Meetings are held every Monday evening at the Spread Eagle, Bisley Old Road, Stroud, with lectures, Morse under G5ZK and general instruction by G5HC. The junior members have undertaken the construction of a Club receiver under the watchful eyes of the more experienced. Secretary Ayers asks for 58 mc co-operation in the district—the nearest station we know of is G8DT, Cheltenham.

Bradford Short Wave Club.—They are on the air with G3NN, and good progress has been made with the new club-room. The Morse class has recommenced, membership is now a total of 52, including 12 juniors, for whom the Club has a special welcome. We are particularly asked to say that new SWL membership will be gladly received. Bradford has shown an excellent record of steady progress; starting from scratch in the summer months, they have gained a splendid membership, acquired their own premises, and have a station on the air. As we have remarked once before, this all means hard work by someone.

Romford & District Radio Society.—They meet every Monday, 8.0 p.m., at Mawneys Road Schools. Activities have included D/F contests with other societies in the area. The last was on September 29, the contest being a "walking" affair over a 2 mile radius, to combat the petrol shortage! G3FT offers details of how these events are organised, as he suggests something on the same lines might be of interest to other Clubs.

Reading & District Radio Club.—The recent summer weather having encouraged indoor activity, Reading members have been busy on all bands. G4CY gave a useful talk on the power supply "before it reaches the station" (August 31) and on September 14 a by-request junk sale was held. The Lewis Cup competition is being well supported. The October meetings are on the 12th and 26th, those following being on November 9 and November30.

Stockport Radio Society.—The first meeting of the winter session was held on September 2, when 34 members attended to settle the Club's business and hear a lecture on aerials by G3LX. With a total present membership of 60, meetings are held every Monday in the Textile Hall, Chestergate, and consist alternately of lectures and discussions; Morse instruction is also given.

City of Belfast Y.M.C.A. Radio Club.—The club-room has been almost completed and old members would hardly recognise GI6YM if they saw it now. During the rebuild, the room was screened with wire-mesh which, it is hoped, will eliminate the noise-interference which was always one of the troubles at GI6YM. A new transmitter is under construction, membership continues to increase, and a new series of talks has been planned. New members are welcome on Wednesdays after 8 p.m., at the club-room, which is open every evening except Sundays.

Hi-Q Club, Giffnock.—An excellent report from GM2FZT, who remarks that their weekly meetings are going from strength to strength. The winter session opened on September 12, with a very useful talk by I. B. Jamieson, B.Sc., on "Cathode-Follower Detection as used in a Straight Receiver." Two new calls have appeared in the Club, GM3AKK (28 and 58 mc) and GM3ANV (14 mc). GM3AR is on 1·7 mc, looking for contacts with southern stations, but the bulk of the Hi-Q activity is on 14 and 28 mc.

Surrey Radio Contact Club.—At the last meeting on September 10, a record attendance of 60 turned out to hear G2MV talk on aerials; it was clear from the many questions he had that his lecture aroused a great deal of interest (we also heard it was very good). Over the week-end September 14-15 they held a club field day, with the station operating on 14 mc. A gallant undertaking in view of the weather!

Salisbury & District Short Wave Club.—Members of the receiver section have been busy on the Club superhet, which is a 10-valve job with plug-in coils and band spread. The transmitter section is responsible for a CO-ECO-PA, which they hope to have on the air shortly. The Morse angle is looked after by G2FIX and G5DZ. Meetings are held every Tuesday at 7.30 p.m. and the Club workshop is open to members any evening.

Edgware & District Radio Society.—They have found new headquarters which are a great improvement on the old; it has been decided to change meeting nights back to each Wednesday. Membership is now 72, and when a recent postal vote was organised for the election of committee members, 70 per cent. of the membership responded, which indicates a very healthy state of affairs. Member S. Fryer passed the R.A.E., the only entrant from Edgware and a real amateur with no professional or Service experience. This tends to support our contention that the R.A.E. is a fair and reasonable test.

Doncaster & District Amateur Radio Society.—They now have permanent HQ at 73 Hexthorpe Road, and are busy getting them ready for occupation. Membership is 40, including three YL's. On September 19, the Club visited Finningley R.A.F. station, which was a Bomber O.T.U. during the war.

Hounslow & District Radio Society.—Average attendance at the last four meetings has been 20 members, and some well-prepared papers on a variety of Amateur Radio subjects have been discussed. The Club is now planning for the winter—one idea is an "exchange and mart" night.

St. Pancras Radio Society.—The winter session has started, with meetings on Mondays, Tuesdays and Thursdays each week, 7.0-9.0 p.m. One evening is allocated to elementary instruction in the fundamental principles of radio, the instructors being G2DDK and G2FMJ. Several ex-Service members have undertaken responsibility for teaching Morse, and in general the Club looks forward to a busy and successful season. They also hope shortly to see a number of their pre-war members, who were full licence holders, when they return from the Services. St. Pancras are very anxious to obtain the co-operation of other Clubs and would particularly welcome assistance in the matter of lectures and lecturers.

Following are the names and addresses of the secretaries of the clubs mentioned this month. They will be pleased to give every assistance to prospective members.

ABERDEEN. A. J. Anderson, B.Sc., 87 Braemar Place, Aberdeen.
BELFAST. F. A. Robb, GI6TK, 60 Victoria Avenue, Sydenham, Belfast, Northern Ireland.
BIRMINGHAM. C. W. Thompson, 6 Caldwell Road, Birmingham, 9.
BRADFORD. V. W. Sowen, G2BYC, 6 West View, Eldwick, Bingley, Yorks.
CHELTENHAM. H. Brislin, 52 Cleevemount Road, Cheltenham.
COVENTRY. J. W. Swinnerton, G2YS, 118 Moor Street, Coventry. (*Tel.* : *Coventry* 4578).
DONCASTER. H. Flintham, 50 Burton Avenue, Balby, Doncaster.
EDGWARE. P. A. Thorogood, G4KD, 35 Gibbs Green, Edgware, Middlesex.
GRAYS. B. Edmonds, G3AGU, 22 Brentwood Road, Chadwell St. Mary, Essex.
HI-Q. J. D. Gillies, GM2FZT, 3 Berridale Avenue, Glasgow, S.4.
HOUNSLOW. A. H. Pottle, 11 Abinger Gardens, Isleworth, Middlesex.
LEEDS. F. Stork, 1 Brudenell View, Leeds, 6.
LIVERPOOL. T. W. Carney, G4QC, 9 Gladeville Road, Aigburth, Liverpool, 17.
OSWESTRY. A. D. Narraway, Lamorna, Pant, Nr. Oswestry, Salop.
ST. PANCRAS. H. Brown, 84 Blenheim Gardens, London, N.W.2. (*Tel.* : *GLA* 3212).
READING. R. J. Nash, 9 Holybrook Road, Reading.
ROMFORD R. C. E. Beardow, G3FT, 3 Geneva Gardens, Whalebone Lane, Chadwell Heath, Essex.
SALISBURY. C. A. Harley, 85 Fisherton Street, Salibury, Wilts.
SLADE. L. A. Griffiths, 47 Welwyndale Road, Sutton Coldfield, Birmingham.
SOUTH SHIELDS. W. Dennell, 12 South Frederick Street, South Shields, Co. Durham.
STOCKPORT. L. Chappell, G2AAY, Heathfield, Buxton Road, Disley, Nr. Stockport, Cheshire.
STOKE. D. Poole, 13 Oldfield Avenue, Norton-le-Moors, Stoke-on-Trent, Staffs.
STROUD. K. D. Ayers, Victoria Villas, Whiteshill, Stroud, Gloucestershire.
SURREY. L. Blanchard, 122 St. Andrews Road, Coulsdon, Surrey. (*Tel.* : *Uplands* 3765).
SWINDON. P. Greenwood, G2BUJ, 49 Western Street, Swindon, Wilts.
WANSTEAD. F. C. Judd, G2BCX, 111 Mayband Road, South Woodford, London, E.18.
WATFORD. J. C. Warren, 29 Market Street, Watford, Herts. (*Tel.* : *Watford* 5988).
WEST HARTLEPOOL. A. R. Donald, G3TO, 186 Stockton Road, West Hartlepool.
WEST MIDDLESEX. N. Priest, 7 Grange Road, Hayes, Middlesex.
WIGAN. H. King, 2 Derby Street, Spring View, Nr. Wigan, Lancs.

Coventry Amateur Radio Society.—We mentioned last month that G2ZT had recently given up the secretaryship; what we did not know till the present report came in was that he has been secretary of C.A.R.S. for no less than 14 years! In recognition of this long record of service, which to our knowledge is unique in the radio club world, he was recently presented with a certificate of life membership. C.A.R.S. meetings are very well attended, and the visit to the BBC at Daventry was a great success. The next such outing is to Rugby Radio on October 26.

Liverpool & District Short Wave Club.—G3ADH is the Club call under Class-B conditions, with a 'phone endorsement. G6VS and G8JU have continued their very helpful talks, and a lecture of particular interest was one by G6KS on aerials; he dealt with the subject at considerable length and has been asked to prepare another on similar lines. The visit to Seaforth Radio, GLV, was a great success and the station personnel are specially thanked for the trouble they took in making the visitors welcome.

Leeds Radio Society.—They recommence their winter session at the Swathmore Settlement (every Friday at 7 p.m.) and look forward to the support of local readers, particularly holders of transmitting licences. It is hoped to have a fully active station on the Club premises.

West Middlesex Amateur Radio Club.—Sir Ernest Fisk of E.M.I. has consented to become President of the Club, and his acceptance was announced at the meeting on September 11. Club nights are the second and fourth Wednesday in each month; on September 25, G6WK discussed television.

Watford & District Radio & Television Society.—The last month's meeting, on September 3, drew 28 members, when the evening was largely taken up by a junk sale, with the usual success attaching to such affairs. On October 1, a general get-together was arranged to meet a number of visitors from outside the Watford area.

Swindon & District Short Wave Society.—On September 14 the first of a very interesting series of talks was given on the operation and application of the cathode-ray tube. With nine transmitting members already, three more calls are expected in the town very shortly.

Oswestry & District Radio Society.—The second meeting of this new organisation was held on September 10 and produced a good attendance. We see at least one of the OT calls in the list—G6US; 73, OM! A room has been made available for future meetings in the Oswestry Technical Institute, where members will foregather on the second Tuesday in each month. To date Oswestry has some 16 licensed members, with more to come from the official mill.

Stoke-on-Trent & District Amateur Radio Society.—Morse classes have commenced and technical classes will shortly be started, the latter in the form of lectures followed by a practical period. G3UD has recently become the new chairman; known as Colonel

Bandspread, he is said to be working on a secret D/F machine for detecting beer. On the more serious side—though we welcome a break like this occasionally—Stoke now have 40 members, with new arrivals at every meeting. The last was on September 12, when Colonel Bandspread gave a successful demonstration of Amateur Radio operating for the edification of non-transmitting members.

West Hartlepool & District Radio Club.—Membership has gone up to 33, and the Club lectures are now being devoted to the syllabus of the R.A.E. Two new calls issued to members are G2AIX and G3AJA; four aspirants propose to take the November R.A.E.

Grays & District Amateur Radio Club.—G3AGU is the new secretary here, and reports that G2YH gave a very interesting lecture on voice-controlled carrier working, which he illustrated with a system he has in operation on 1·7 mc.

Birmingham & District Short Wave Society.—A great blow is the recent death of their popular and successful secretary, G. Hodgkiss, who had done a great deal to sustain and encourage the Club. His successor is C. W. Thompson. The Club meets on the first Monday of the month, 8 p.m., at the "Hope and Anchor," Edmund Street, the next being on October 7, when the R.A.E. paper is to be discussed. A regular feature of each meeting is an affair known as the "monthly log," when a member summarises conditions for the preceding month and discusses the DX heard. Birmingham challenges any other club to a DX listening contest (teams four a side) to take place over the week-end October 19-20. Secretaries interested are invited to get in touch.

South Shields Amateur Radio Club.—They continue to make progress and the recent series of lectures proved useful and interesting to both receiving and transmitting members. The general meeting was held on September 27, when new officials were elected and a programme considered for the coming winter session.

'PHONE/CW AREAS

Help rationalise the use of the 3·5,7, 14 and 28 mc bands by keeping 'phone in the 3685-3800, 7200-7300, 14,200-14,300, and 28500-29500 kc areas. New 3-letter G's and CW operators, please choose your crystals to give working points in the 3500-3635, 7150-7200, 14100-14200 and 28000-28500 kc areas.

NEW QRA's

These are now coming in so fast that they have caught up on us to the extent that we are more than a month behind on publication. The list this time was actually made up before the September issue was published, and we already have over a page-full for November, with October yet to go !

Readers will probably agree that more than one page (which allows an average of 50 addresses) is hardly justified. Nevertheless, if the rate of receipt continues to outstrip publication, we shall do a two-page spread to get level again. We think that " New QRA's " is a useful feature, particularly as the lists we print are automatically incorporated in the Call Book.

THE PAPER ALLOCATION

An increase in paper supplies has been much publicised in the daily Press. At present, however, the increase applies *only* to newspapers, and not to periodicals of any other description.

It is reasonable to expect that in due course established publications in other categories will also be allowed a certain amount of extra paper. Unless when it does come this increase is a great deal more than we expect, it will be used to widen the circulation of the *Magazine*.

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HAPPY NOTE

To date we have had nearly 3,000 letters written apparently for no other purpose than the kindly one of expressing appreciation of the *Magazine* and of our efforts to provide a publication worthy of British Amateur Radio.

Such backing is very gratifying and extremely encouraging. But no one need think that we imagine the *Magazine* cannot be improved. There is much yet to be done before the " sit-back-and-take-a-holiday " stage is reached.

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WANTED, Urgently, SX24, HQ120X, NC100X, NC81X or similar RX. Particulars and Price to BRS.13,120, 66 Greystone Avenue, Burnside, Rutherglen, GLASGOW.

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