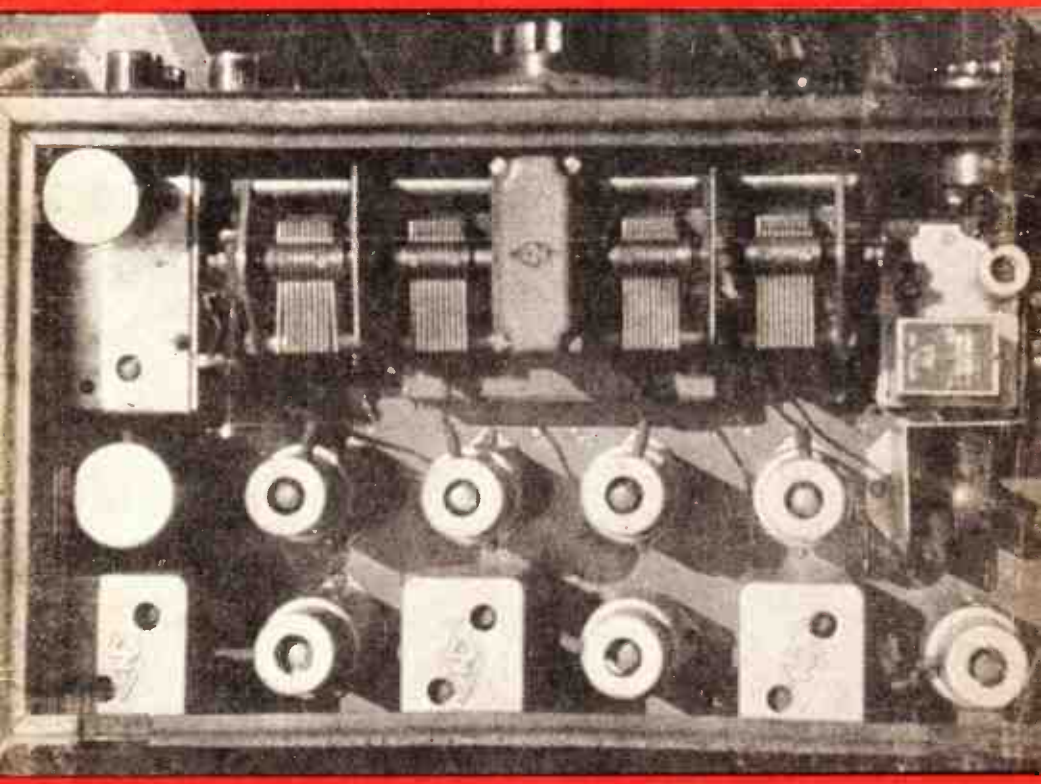
Vol. 8
Number 9
SEPTEMBER
1953

The RADIO AMATEUR

SPECIAL CONSTRUCTIONAL FEATURES

Modifications to HRO.

The "Bandhopper"—All Band Tabletop Tx.



ALSO IN THIS ISSUE . . .

Strictly for the Beginner—Buffers and Doublers. Narrow Band Phase Modulation. VFO Discussion. Talks about VHF. On Being an XYL Operator. Broadcast Bands, Amateur Bands and VHF Commentaries, Club News, etc.

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OUR FRONT COVER

Shows the interior of the modified HRO described in this issue. The 100 kcs calibrator can be seen in the top right hand corner of the illustration.

The
RADIO Amateur

Vol. 8. No. 9. Annual Subscription 18/- September 1953

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EDITORIAL

Somewhat against our will, we are being driven to the conclusion that " what the boys want " in an amateur radio magazine these days, is constructional features; constructional features and still more constructional features !

Your Editor admits to having a secret liking for those topical features which have been, we might almost say characteristic, of the periods in the life of this magazine during which he has occupied the editorial chair. Accounts of interesting radio installations and equipment; broadcast and amateur station descriptions; the story behind famous radio personalities and so on. For him—and some others—these have been the spice which flavoured the whole. But we have to admit that those readers with a liking for that type of material are in the minority. So too, apparently, are those interested in DX commentaries, SW broadcast station news and VHF topics. We know that chiefly because ionospheric conditions have deteriorated so much in this period of the sunspot cycle, interest in DX working has fallen off greatly. In fact, the LF amateur bands are rapidly becoming the most popular once again. The position of the broadcast SWL has always been difficult in this country, where the question of providing literature for him is concerned. One monthly periodical devoted solely to his needs has recently ceased publication, and our own SWL readers cannot number very many.

One of the peculiarities of " minorities " is that they are usually very vocal and by far the keenest members of the community. To hear some of the VHF gang at times, you'd think the whole of amateur radio participated in VHF work. The single sideband types could almost be numbered on the fingers of one's hands, but for keenness and enthusiasm for their cause, they'd be hard to match anywhere. And so on with the other specialities.

But it seems that the mass of readers are, in the main, constructors, and as they pay the bill, they are entitled to call the tune. During the summer months which have just passed, we have kept to our policy of publishing a fair proportion of general reading matter, as the summer months are months of " low activity " where amateur radio is concerned. With this issue, we start out once again on the busy season for amateur radio. We get back into our workshops and radio shacks—and we start rebuilding.

So with this issue, we shall become more constructional in our contents. We have some good ones up our sleeves as the first—this month's special article—" The Bandhopper "—will confirm. A.G.C.

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

Component Review. Manufacturers, publishers, etc., are invited to submit samples or information of new products for review in the section.

CHEQUES and Postal Orders to be made payable to Data Publications.

ALL CORRESPONDENCE should be addressed to " The Radio Amateur," 57 Maida Vale, Paddington, London, W.9. Telephone CUN. 6518.

MODIFICATIONS to the HRO

by

E. H. TROWELL, G2HKU

This article describes how an HRO receiver was converted to operate efficiently on either AC or DC mains supply and also includes such improvements as increased IF gain; 100 kcs check oscillator; voltage stabilised HF oscillator; noise limiter; new output stage with increased audio output to headphones and a frequency trimmer-cum-dial corrector. All numbering and lettering conforms with the *HRO Instruction Manual* except as otherwise stated.

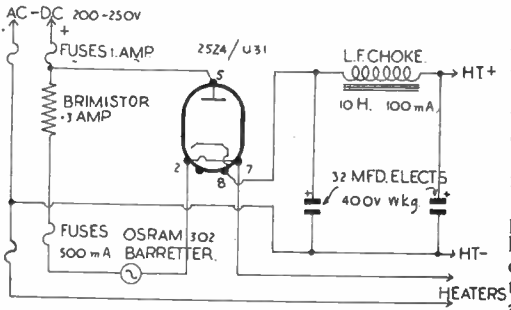


FIG. 1. AC-DC POWER SUPPLY

Power Supply

As in all series heater-communication receivers it is necessary to pay particular attention to the order of sequence of valves and the result of much experimentation is the present arrangement. The power supply shown in Fig. 1 is considered first. The Brimistor may be omitted but it is well worth its cost as the initial voltage surge through the valve heaters when switching on (which is common to all AC-DC receivers) is completely removed. This helps to prolong valve life as does the regulation of the barretter specified. The Barretter is sometimes "looked down upon" by a few people—it may even be a little old fashioned, but nobody has yet devised anything better for this purpose. If cost be of prime importance then both Brimistor and Barretter may be replaced by the usual dropping resistor which may be calculated from the formula:

$$R = \frac{\text{Mains volts—total heater volts}}{\text{Heater current in amps}}$$

where R is the required resistance in ohms. The rectifier may be either the American 25Z4 or British U31.

Connection to the receiver is made via the original power supply lead. To commence work on the receiver, turn it upside down (dial facing operator) remove base plate and the power supply cable will be seen entering in the back right corner. Lift the red heater wire and remove heater centre tap resistor on the CW oscillator valve. The black heater lead may be left connected and series heater wiring commenced using existing wire by cutting paralleling wire off from each valve in turn and joining where required to next valve. The order in which valves and "S" meter lamp are wired is firstly CW oscillator then output valve, first RF, second RF, first Detector, HF oscillator, first IF, second IF, second Detector, 100 kcs oscillator, "S" meter lamp and return to red lead. The new output stage 12A6 has a .15 amp heater and connected in parallel across its heater is the new EA50 noise limiter diode heater. The red indicator lamp on the front panel should not be connected as this position is used for another purpose and in any case the "S" meter lamp already performs this function.

IF Gain

The IF Gain may be increased by removing the cathode resistor of the 6D6 second IF stage, and replacing it with one of approximately 500 ohms. This is marked R9 in the *HRO Instruction Manual*, and varies with individual receivers, from 1000 to 5000 ohms. If the receiver has already a 5000 ohms cathode resistor fitted, then the new one should be about 1000 ohms for a first trial. The value is not critical however, but the increased gain is most noticeable from 1.7 Mcs to the end of the HF range.

100 kcs Oscillator

With a receiver fitted with the dial mechanism of the calibre of the HRO, this small oscillator unit virtually makes the receiver a frequency standard. Referring to Fig. 2 and 2a, a 6AM6 (British Osram Z77) is used but the 6AK5, 6AK6 or 6AU6 will work equally well, provided that allowance is made for different heater currents. The component values are not very critical and C6 may be varied to suite the audio output required from the oscillator. The value chosen gives a fair signal at 30 Mcs. For increased signal strength C6 may be increased to 30 pf or R4 may be increased to 200 k. It is

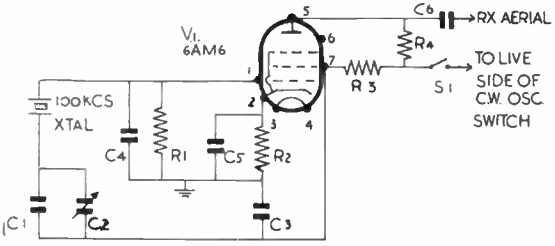


FIG 2 100 KC/S OSCILLATOR

RA197

TABLE OF VALUES

C1—30 *pF*
C2—25 *pF*
C3—50*pF*
C4—50 *pF*
C5—.002 *mfd*
C6—10 *pF*
R1—620 *k*
R2—200 *ohms*
R3—50 *k*
R4—160 *k*

best to check the receiver at 1.7 Mcs and at 30 Mcs to adjust C6 or R4 to one's taste. Naturally, the signal is very much stronger at the low frequency end of the range and no connection to the receiver aerial terminal is necessary but it is normally required on the HF ranges. As the circuit is of the aperiodic type other crystals may be used such as 1000 kcs although of course 100 kcs is optimum for most people. The oscillator may be zero beat with WWV on 2.5, 5, 10, 15 or 20 Mcs or a similar known transmission by means of C1. This will vary the frequency a few cycles and once set should not need further adjustment. The mounting plate dimensions are given in Fig. 2a, and are suitable for most models of the HRO. The holes coincide with those already drilled in the receiver chassis below the "S" meter adjacent to the aerial input terminals and this facilitates installation. The photograph shows the unit mounted on stand off insulators 1¼ in. high and another view shows the position of the on-off switch S1 on the front panel between the "S" meter and main tuning dial. It will be found easiest to solder C6 to the underside of the receiver aerial terminal, the wire passing through one of the already provided holes in the receiver chassis to the oscillator unit.

HF Oscillator

Stabilisation of this stage affords a very marked improvement in reception and reduction of drift. Referring to Fig. 3 and the underneath view of the receiver, the VR150/30 can be seen mounted horizontally between the HF oscillator on the left, and the first detector on the right. The plate lead of the oscillator is lifted from its HT tag and connected to pin 5 of the VR150. The oscillator HT connecting point is a small tag strip which can easily be located near the corner of the coil box shield between the oscillator and first IF valve bases. The 3000 ohms resistor should be connected to this. On this tag strip there is also a convenient earthing tag for the .01 mfd mica condenser and pin 2 of the VR150/30. After completing the modification the HT voltage should be carefully checked at the oscillator anode. The absolute minimum striking voltage for a VR150/30 is 180 volts so the resistance value of 3000 ohms may need to be more or less depending on the HT voltage available. It must be stressed that serious damage can result if the value of this resistance is too low. A final voltage check on the main HT line should reveal no decrease when the VR150/30 is plugged in, if it does, then the resistor is too low in value.

Noise Limiter

The VR92 or EA50 used as the noise limiter has its heater wired in parallel with the 12A6 output valve since both valves have .15 amp heaters. This has produced no ill effect in practice and gives satisfaction. The circuit in

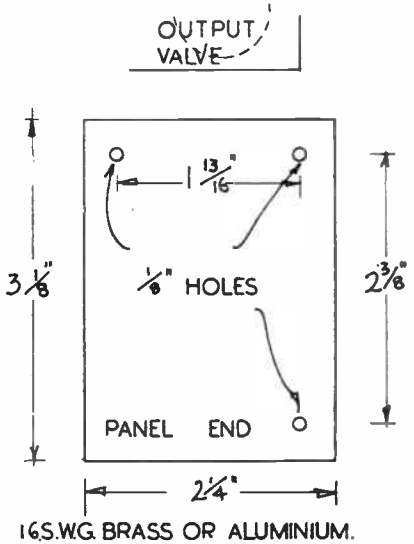
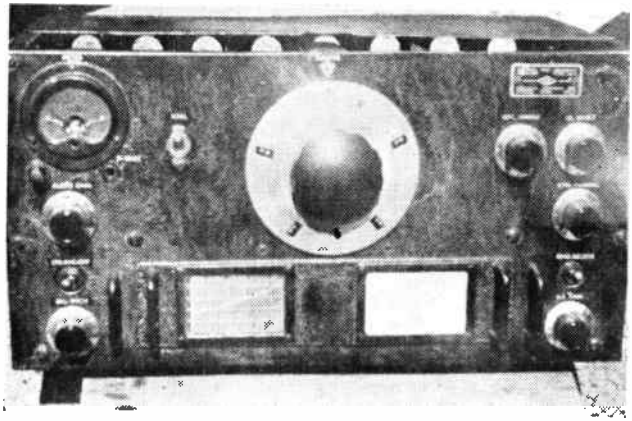


FIG 2A. 100 KC/S OSCILLATOR MOUNTING PLATE

RA198



The positions of the additional Controls are well shown in this photo.

Fig. 4 is the original HRO circuit and the noise limiter is incorporated in Fig. 5. It is a standard series type of circuit and no originality is claimed for it. It is, of course, self-adjusting to the receiver carrier level. Naturally, it is not effective on CW, but it is very useful for telephony reception through ignition interference, etc.

The VR92 is mounted on the inside back of the chassis close to and just above the 6B7, second detector valve holder. Referring to Fig. 4, the second detector load resistor R12 should be removed and replaced by RA and RB as in Fig. 5, wherein the additional components are listed. R12 may be easily located between a mica condenser (C12) and a paper one (C14) parallel with the rear of the chassis immediately adjacent to the 6B7 valve holder. The connection between R13 and C14 is removed and C14 connected as in Fig. 5 to the VR92 cathode. The rest of the wiring should then be carried out using screened wire, well earthed at several points to connect the on-off switch S1. This can be mounted below the 100 kcs oscillator switch or beneath the position lately occupied by the indicator lamp. The writer uses the limiter in circuit all the time and no switch is required.

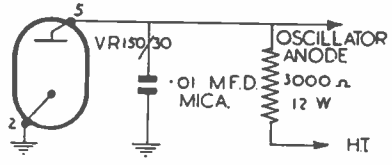


FIG.3. VOLTAGE STABILISER.

RA199

As with all half-wave limiters a small decrease in audio output is inevitable though normally, this is of no real consequence. This circuit is, of course, applicable to receivers other than the HRO. A 12H6 may be used instead of the VR92 if desired although it requires much more room for installation.

New Output Stage

A number of people, the writer among them, find that they are not satisfied with the audio output from the second detector to the headphone jack, so the circuit shown in Fig. 6 was devised to replace the existing output stage.

V9, a type 42 valve, is removed together with its holder and an octal valve holder substituted. The output transformer T5 is mounted inside the chassis on the side just above the output valveholder as may be seen in the photograph. The leads to the headphone jack are removed and connected as in Fig. 6. The only change in components is the cathode resistor R25 which should be changed from 500 ohms (in most HROs) to 350 ohms. The condenser CA of .1 mfd is the only addition required. It will be noticed that the output to the speaker is virtually shorted when the headphone jack is inserted. In actual use over a considerable period this arrangement has never caused any trouble and is simple to connect up. The speaker will still be alive of course, but to obtain much volume with the headphone jack inserted would require overloading the headphones. Upon removal of the jack the speaker will resume its normal function of course.

The 12A6 was chosen for this new output stage partly because of its availability at a low price and because it is an excellent valve for the job.

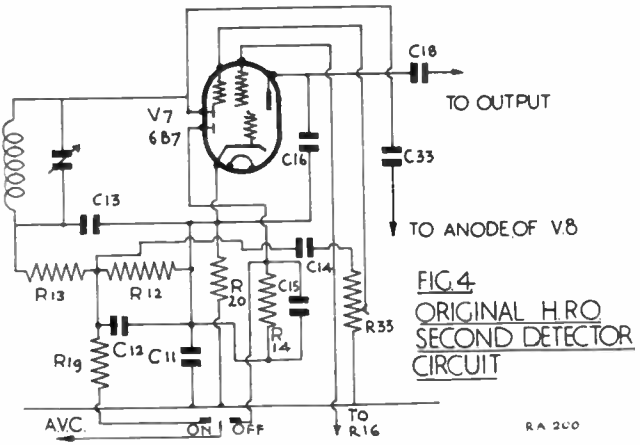


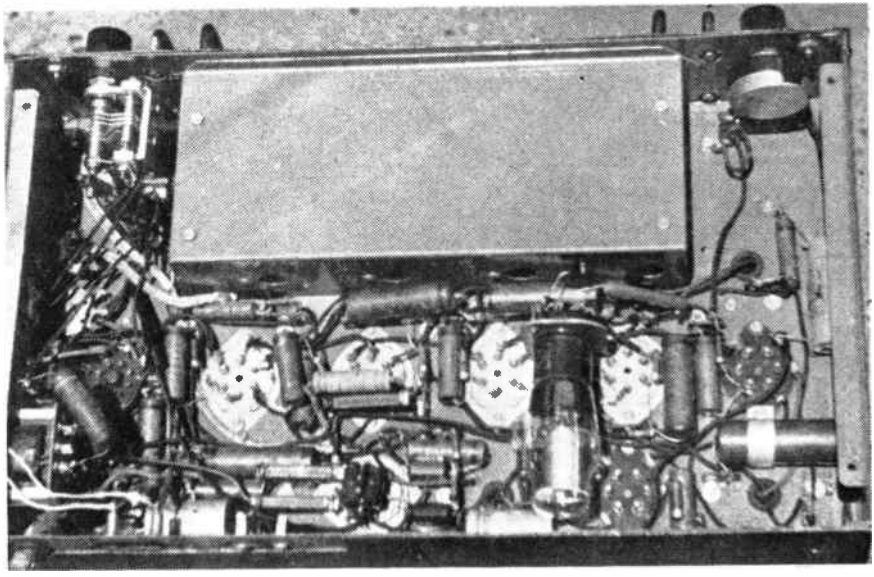
FIG. 4
ORIGINAL H.R.O. SECOND DETECTOR CIRCUIT

R12—500 *k*
R13—50 *k*
R14—250 *k*
R19—500 *k*
R20—300 *ohms*
R33—500 *k*
C11—10 *mfd*
C12—.0001 *mfd*
C13—.00025 *mfd*
C14—.1 *mfd*
C15—.01 *mfd*
C16—.0005 *mfd*
C18—.1 *mfd*
C33—2 *mfd*

Frequency Trimmer

The ability to move the HF oscillator frequency very slightly is of great use at times enabling one to correct the dial reading without altering the coil adjustment screws.

The hole left by the removal of the red indicator lamp is enlarged to take a standard ¼-in. shaft bushing as shown in Fig. 7. The small bush with tapped hole for a set screw is soldered to a copper plate and axial movement of the shaft is prevented by pushing the



Under chassis view of modifications

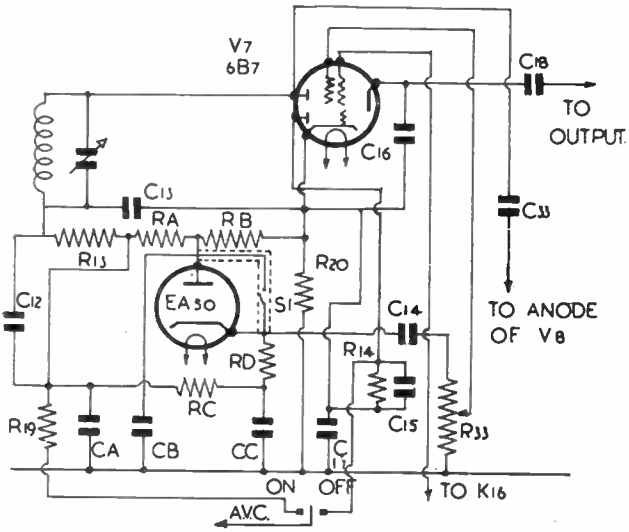
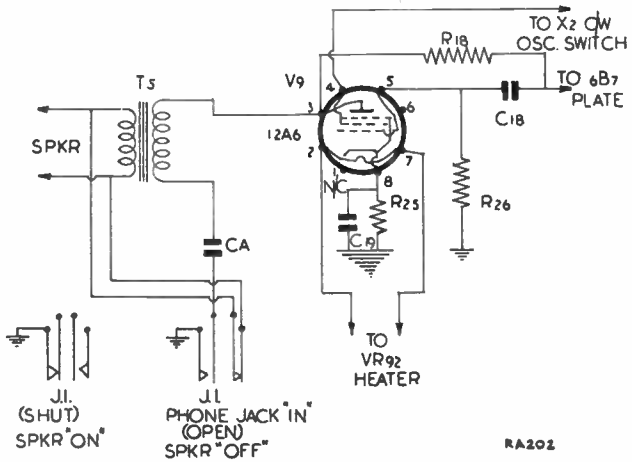


FIG.5. MODIFIED H.R.O SECOND DETECTOR CIRCUIT

RA201.

RA—250 *k*
RB—250 *k*
RC—1 *Meg*
RD—800 *k*
CA—.0001 *mfd*
CV—.0001 *mfd*
CC—.05 *mfd*

All other values as in Fig. 4



RA202

FIG. 6 NEW OUTPUT STAGE FOR THE H.R.O

R18—100 *k*
**R25*—350 *ohms*
R26—500 *k*
CA, C18—.1 *mfd*
C19—10 *mfd*
J1—*Phone Jack*

**R25* in HRO is 500 ohms and should be changed.

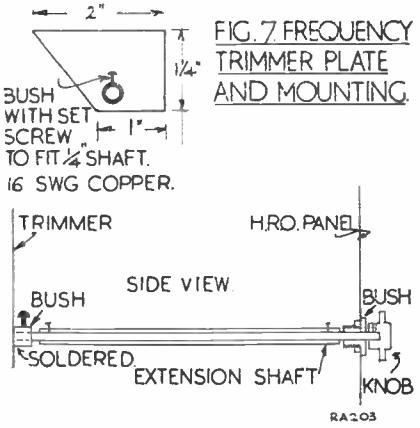


FIG. 7 FREQUENCY TRIMMER PLATE AND MOUNTING.

control knob on the shaft against the panel when tightening up. The writer used polystyrene rod as a shaft partly to prevent electrical noise as it is turned and partly to obtain a good fit in the panel bush, since the rod is slightly oversize and needs rubbing down with smooth glasspaper to obtain a good fit. The trimmer may be seen in the photograph between the crystal phasing box and the main tuning condenser.

Used in conjunction with the 100 kcs oscillator this trimmer enables the band edge to be set and maintained at a given dial reading. The grid lead of the HF oscillator V4, is dressed close to the copper plate of the trimmer, whilst the 100 kcs oscillator is switched on, and adjusted until enough variation in frequency is obtained by rotation of the control knob of the trimmer.

IT SHOULD BE NOTED THAT WITH THE HRO OPERATING AS CONNECTED IN THIS ARTICLE, THE NEGATIVE SIDE OF THE MAINS SUPPLY IS LIVE TO THE CASE.

STRICTLY FOR THE BEGINNER

PART 8. **by O. J. RUSSEL, B.Sc., A.Inst.P., G3BHJ**

BUFFERS and DOUBLERS—*Continued*

Previously, the question of valve types suitable for buffer and doubler service has been mentioned. The value of modern pentodes and tetrodes of high power sensitivity has been stressed. This does not mean that triodes are necessarily obsolete, as some of the new miniature triodes, and particularly double triodes such as the 12AU7 and the 12AT7 are particularly useful. In view of the modern tendency for compact transmitters, the use of double triodes is especially valuable as two doubler stages can be obtained with one miniature " bottle."

Owing to the need for neutralisation, triodes present a problem if used " straight through " as amplifiers. However a neat solution of the problem is achieved by the use of the new double triodes as " push-push " doublers for doubler operation, and as self-neutralised amplifiers in " straight through " operation. A typical circuit is shown in Fig. 1. With both halves in operation, the circuit is used as a doubler in the " push-push " circuit. The " push-push " doubler has the merit of high efficiency, and output comparable to a straight Class C amplifier, so that good drive is available when doubling. Incidentally, the push-push doubler is particularly valuable for UHF use, particularly as triodes such as a pair of 7193s will give high output, and are considerably cheaper than special UHF pentodes. The 12AU7 and 12AT7 are also good performers in 2 metre transmitter drive stages when used as push-push doublers.

For use on the lower frequencies, the push-push doubler becomes a self neutralised amplifier by opening the cathode connection to one of the triodes. The stage then becomes a grid neutralised single sided amplifier, in which the neutralising capacity is supplied by the inter-electrode capacity of the disabled triode section. Incidentally in view of the good performance of modern miniature triodes, it is as well to remember that a conventional neutralised single triode stage is equally effective if used as a doubler or tripler, as the presence of the neutralising circuit is actually helpful when doubling.

Some general observations on valve selection may prove helpful. First of all the so-called " figure of merit " which has some virtue as a guide to the design of wide-band amplifiers, is not a very useful guide to buffer valve selection. In fact we should immediately abandon most of the popular transmitting tubes were the " factor of merit " to be as important as some seem to think. In point of fact there is little difference in the practical operation of valves

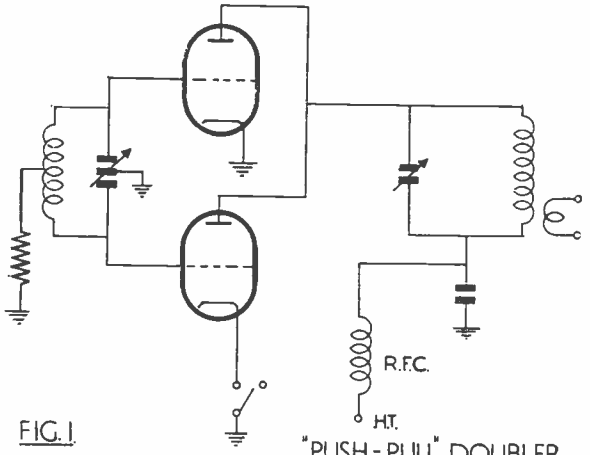


FIG. 1. "PUSH-PULL" DOUBLER. KA174

With cathode circuit of V_2 closed the stage is a push-push doubler. With the cathode circuit of V_2 open circuited, the stage becomes a neutralised amplifier.

having factors of merit differing by enormous amounts, and in fact the highly sensitive 807, 6V6 and 6L6 are right down towards the end of the " factor of merit " tables published ! Anybody who has decided to abandon such tubes as the 807 because of the " factor of merit " consideration, can be assured that despite the " factor of merit " bogey, the 807 still remains as a highly efficient valve, and that the substitution by a valve having a much greater merit factor will not effect any magic improvement.

However, there is a much better valve property than the " factor of merit " for selecting valves for doubler and buffer service. For doubling particularly, a valve having a high amplification factor (" high mu ") is desirable. As pentodes and tetrodes generally have higher " mus " than triodes, they are mostly used for buffers and doubler circuits. However, there are some high mu triodes which give a creditable performance without requiring excessive drive. Valves having a " mu " in the range 20 to 200 are suitable, whereas " low mu " tubes having a mu of 10 or so are unsatisfactory. If the " mu " is very low, the absurd situation may be reached in which the grid drive voltage is as large as, or even greater than the RF output voltage at the anode !

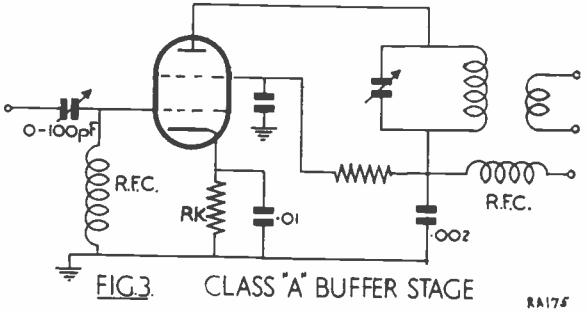
With regard to drive requirements for buffer amplifier and multiplier operation, Fig. 2 lists the approximate bias values required for straight-through amplifiers, doublers treblers and quadruplers. Cut off bias is represented by 1 and is the condition for a " Class B " amplifier, as TVI problems have made it fashionable to operate where possible with low drive. Class C operation requires valves of 1.5 times cut off or more, while before the advent of TVI, values of bias up to 2½ times cut off were used to improve anode efficiency in straight Class C amplifiers. As heavy drive coupled with bias well beyond cut off is a potent source of TVI, and as very little drive is needed by modern PA valves, it is well to sacrifice a little efficiency in the drive stages so as to minimise TVI causing harmonics. The noticeably higher biases required for multiplying shown in Fig. 2, stress how high bias and high drive accentuate harmonic production. For the drive stages therefore, operation in Class B is recommended for straight through amplifying, and the lowest bias and drive that gives adequate multiplying when doubling or trebling. Efficiency when multiplying falls off rapidly if the bias is reduced below the figures of Fig. 2. However, a very low efficiency is tolerable in the drive stages, particularly as it is helpful in keeping down TVI. As an extreme example, a doubler stage with a modest 5 watts input would deliver 1 watt of RF if its efficiency was only 20 per cent. One watt of drive is adequate to drive an 807 to full output,

Operation	*Approximate Bias*
Class B Linear	Cut off
Class C	1½ to 2½ Times Cut off.
Doubler	2—3 Times Cut off.
Tripler	3—4 Times Cut off.
Quadrupler	5—6 Times Cut off.

Fig. 2. Bias conditions in amplifier and multiplier operation.

so that it is unwise to strive for high efficiency in the driving stages. The case of UHF operation is of course rather different, as the main difficulty at UHF is in obtaining adequate drive for efficient operation so that the last ounce has to be squeezed from the drive stages. On the other hand one can drive hard at 2 metres without fear of 2 metre harmonics causing TVI ! In the matter of drive, the push-push doubler scores again, as it will double efficiently even when run with the bare cut off bias, and the push-push doubler is popular at UHF for its efficient operation with low drive. For work on the LF bands, the push-push doubler may no doubt come into wider use because of its efficiency with low drive.

While the " efficiency " of an RF stage in a transmitter is of course its efficiency as a converter of DC anode power into RF output so that a stage of 65 per cent. efficiency operating with an input of 100 watts will produce 65 watts of RF, there is another sense in which an amplifier is efficient. This type of " efficiency " is the amount of RF output at the anode for a given amount of drive power at the grid. This is termed the " power sensitivity," and is the RF power output in watts produced at the anode per watt of drive power at the grid. The " power sensitivity " of a given amplifier depends upon the operating conditions as well as upon the valve type. As a guide, triode amplifiers may require a watt of drive in order to produce 10 to 20 watts anode output, while the pentode or tetrode may provide 50 or 100 watts output at the anode for one watt of grid drive. The power sensitivity of a PA stage is very much dependent upon the actual operating conditions chosen, for as previously stated, a tetrode type PA valve gives very little increase in output when drive is increased beyond a certain point, so that increasing drive in effect lowers the operating power sensitivity. In this connection, a Class A amplifier is the case of highest power sensitivity, as no grid current flows, and ideally the grid consumes no power. A Class A buffer amplifier is accordingly often used to follow a VFO, as the VFO is only very lightly loaded by the Class A stage. In fact as a Class A stage requires only a few volts on the grid to produce a good power output, it need only be very loosely coupled to the VFO. This loose coupling coupled with the negligible drive power requirement of a Class A stage make it ideal as a true " buffer," especially as the power output can be high. The bias values, and other operating conditions in Class A RF service are precisely the same as given for ordinary Class A audio operation. Be sure however, to keep the coupling really " loose " to the VFO, as too much drive will drive the grid positive so that grid current will flow, and the load upon the VFO will be increased. As a typical example, the 6L6 operated under its " maximum output " Class A conditions requires some 25 volts of bias, and an RMS grid drive input of some 15 volts of RF. For this modest grid swing, the anode output will be some 6 to 10 watts ! The 6V6 under similar conditions will give 3.5 watts, and in general the Class A audio outputs will be obtained for small output valves in Class A RF service. The Class A buffer stage can be thoroughly recommended for following a VFO. Despite the high power sensitivity of the Class A buffer, it is of course possessed of a rather low anode efficiency, as the usual efficiency of a Class A tetrode is around 35 per cent. Fig. 3 shows a Class A buffer stage, and cathode bias using the recommended bias for audio operation should be used. A " drive adjusting " condenser of 100 pf having a low minimum capacity should be included so that drive can be set to avoid overloading, and to avoid driving the grid into grid current.



Class "A" Buffer Stage. RK is normal bias resistor as used for audio operation.

Narrow Band Phase Modulation

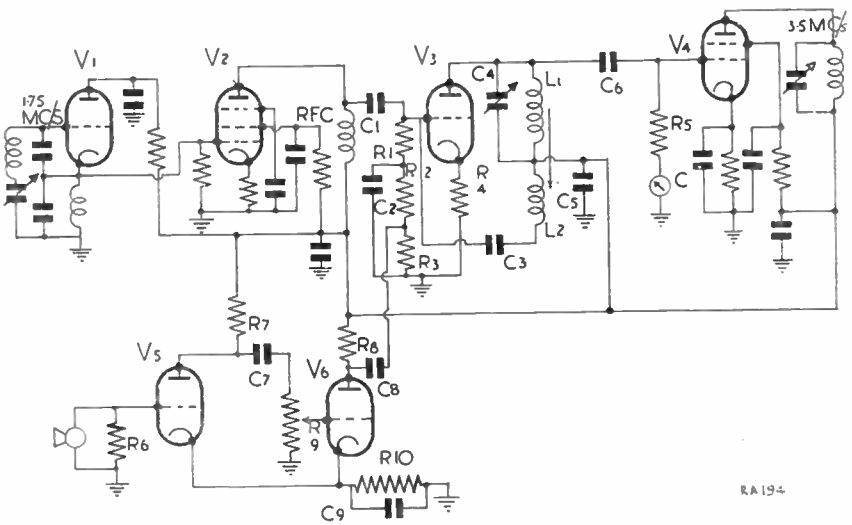
by EVERT KALEVELD, PAØXE

In "The Bandhopper," described elsewhere in this issue, our contributor has used NBPM as the modulating system. In this article he deals with this method of modulation in greater detail

Methods for obtaining frequency modulation can be divided into two groups; the first in which the frequency of a self-controlled oscillator is varied according to the audio frequency changes, so that direct FM results, or those in which the frequency of the oscillator remains constant, but where the output is changed in phase at an AF rate. Since a change in phase is equivalent to an instantaneous change in frequency, phase modulation produces indirectly the same effect as frequency modulation, with only this difference, that the change in phase and also the change in frequency is proportional to the modulating frequency. Therefore it is necessary to produce true frequency modulation to insert a correcting network in the amplifier to attenuate the higher frequencies. Phase modulation necessitates a somewhat more elaborate setup than simple frequency modulation circuits, but the main advantage is that there is no loading of the oscillator, with the consequent impairing—however slight—of its stability.

The Sonar Radio Corporation are using a very simple method of phase modulation which is ideally suited for narrow band FM. At least two "DX-kings" known to the author are using this system entirely for their DX work and both have worked over 100 countries on Phone with it.

The RF output of a VFO with its associated buffer stage is fed to the grid of a high impedance triode—a 6F5 is very suitable—but any RF or AF pentode with screen and suppressor



C_1	250 *pF*	R_1	50 *kΩ*	*C*-	*High mu Triode, see text*
C_2	5000 *pF*	R_2	25 *kΩ*	*V*5,	6 12 *A*& or 6*SL*7*GT*
C_3	*See text*	R_3	0.5 *mΩ*	L_1,	2 *wound on Aladdin iron core former* 7/16 *in. diameter with no* 36 *SWG enam.*
C_4	3.30 *pF Trimmer*	R_4	25 *kΩ*	L_1	75*t*. L_2 30 *t, same direction (ratio* $L_1 : L_2 = 2, 4, : 7$)
C_5	5000 *pF*	R_5	100 *kΩ*		
C_6	250 *pF*	R_6	5 *MΩ*		
C_7	10000 *pF*	R_7	0.25 *MΩ*		
C_8	10000 *pF*	R_9	0.5 *MΩ*		
C_9	25 *μfd* 25 *v*	R_{10}	1 *kΩ*		

grid strapped to the anode will do. The writer used a 9003 with very good results in this way.

This valve (V3 in Fig.) is biased far beyond cut-off by its large cathode resistor. C3 serves to provide an adjustment for the phase and amplitude of the voltage between the grid and the plate. It is not critical, the writer used two insulated wires twisted together. Sonar indicates 2 pf in the original circuit. C4 offers a means of varying the magnitude and phase-angle of the impedance in the plate circuit. This can be a Phillips compression type air trimmer, 3-30 pf. Once the system is tuned and adjusted this capacitor need not be touched. R1, R2, R3 and C2 form a correcting network for the AF, giving an attenuation of 6 db per octave above 2000 cycles, to convert the phase modulation into true frequency modulation.

A 12AX7 double triode is used as an audio amplifier, giving sufficient output from any type of crystal microphone. Its volume control serves as a " deviation control."

The following frequency doubler/buffer stage not only serves to give the required output for driving a beam tetrode of the 807 variety, but also to wash away any possible amplitude modulation. With this circuit, a swing of 1.5 kcs on the fundamental, i.e. 3 kcs on the 3.5 Mcs band can easily be reached.

To adjust the unit, the grid current of V4 is measured, the final amplifier is switched off and the signal is listened to on the desired band. The grid current of V4—a 6V6—should be about ·0.3 mA at least and probably will be much higher. With the volume control—or deviation control—about half way in, talk at normal level into the microphone and listen to the signal. Next tune C4, where a point will be found where the speech is loudest. This setting is usually not on correct resonance, but slightly higher. C4 can be left at this position for any frequency in the Phone bands, if adjusted for the middle of the band, as the circuit is quite broad.

The deviation control is adjusted for every band separately, of course, and when using AM receivers, it will differ for different receivers. Usually one has more often too much than too little deviation. The exact centre of the carrier should have no modulation audible on it when the unit is adjusted correctly.

VFO Discussion

by:—L.C.R.

Of the many factors essential to the satisfactory operation of a variable frequency drive unit for transmitters, probably the most important is stability of frequency, (*a*) during transmission, and (*b*) when switching to " transmit " after a relatively long period of reception.

In the experience of the writer the " acid test " of VFO stability under actual operating conditions is the consistent reception of one's signal by a distant station using a passband of the order of 3 kcs on his receiver.

At 14 Mcs, for example, to quote a round figure, a drift of $\pm$ 1 kcs represents about 0.014 per cent. change of carrier frequency; this is quite tolerable for practical purposes, enabling a contact to be held under difficult conditions without the signal drifting out of the receiving stations passband during the initial " switch to transmit."

It appears to be general practise nowadays to mute the VFO during periods of reception, in order that one can converse with another station on one's own transmitter frequency, and also to facilitate " break in " working. In the quest for stability coupled with good output, many excellent drive units have been evolved to meet the above desiderata, but almost all appear to employ no less than three stages.

It is the purpose of this article to discuss how a single-valve VFO/drive unit may be used very successfully to excite a doubler/push pull PA arrangement operating on 14 and 28 Mcs. There is nothing at all unorthodox nor yet original about the circuit, but the successful operation of the unit relies entirely upon choice of the valve used, components, adjustment, and of course good mechanical stability.

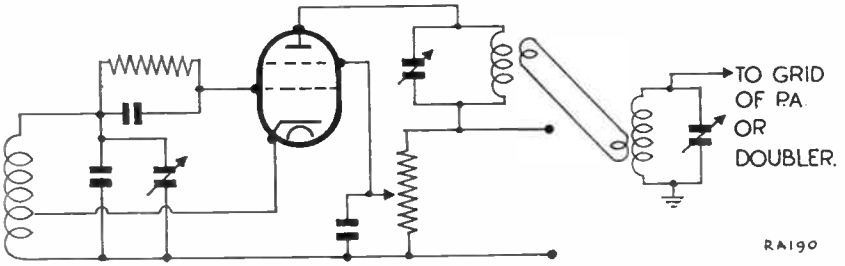
Design Considerations

The requirements for a VFO to meet all contingencies will now be examined, and the merits of various types discussed.

Foremost in the mind of the designer/constructor when considering the merits of various non-crystal controlled drive units are (*a*) stability, (*b*) freedom from long-term drift, (*c*) accuracy of calibration and (*d*) sufficient output to drive doubler or amplifier stages. Let us define the foregoing, and examine the necessary steps which must be taken to fulfil these various properties.

Stability

This refers to the ability of the unit to maintain constant amplitude output and freedom from short-term frequency variations, this type of instability is usually countered by a well-regulated power supply, good quality components and mechanical rigidity of the frequency determining circuits.



Long-term Drift

Temperature variations of the valve(s), and inductances and capacitances which form the frequency determining elements are responsible for this type of frequency drift. This usually occurs over relatively long periods of operation until the equipment as a whole attains a reasonably constant temperature determined by the valve and the ambient air.

Capacitors having a negative co-efficient of temperature are often used in conjunction with those having a positive co-efficient, such that a given change of temperature creates a positive and negative change of capacitance, the resultant of two such variations is to provide a virtually zero change of capacitance.

The above method, whilst being very effective in some respects, does not take into account changes in valve inter-electrode capacitance, which can vary from the cold to "hot" condition by about 4$\mu\mu$F in an RF pentode of high slope which is often used as the oscillator in a drive unit. The above value of 4$\mu\mu$F, added to a capacitance of 200$\mu\mu$F, used in conjunction with 2.6μH to resonate at 7 Mcs, reduces the frequency by something around 50 kcs. In modern oscillator circuits, the LC arrangement which determines the frequency is never sufficiently tightly coupled to the valve input capacitance to be affected directly by it, but valve capacitance changes with temperature must inevitably vary the frequency of oscillation to some extent, and every possible measure must be adopted to combat such variations.

Another source of trouble in the above connection is "pulling" of the frequency by the external load; tuning of the driven stages coupled to the output of the drive unit produces a change of input impedance, this becomes manifest as reflected capacitance or inductance back into the oscillator with attendant frequency variation. The multi-stage drive unit usually employs one or more isolating stages to overcome this effect.

In practise, it is customary to pre-heat the oscillator valve by switching on the heater some 20-30 minutes before applying the anode voltage; subsequent application and removal of the HT anode and screen potentials during a period of working should then be such as to have a minimum effect on the valve temperature. In order to combat frequency drift due to valve capacitance changes with temperature, the writer has successfully employed a valve having a relatively high dissipation, such that application and removal of the HT voltage had very little effect on temperature. In a particular electron coupled oscillator, a type 807 (25 watt DC dissipation) was used with 180 volts on the anode and about 120v. screen.

The screen becomes a "virtual anode" for the oscillator section, whilst the anode proper is tuned to twice the oscillator frequency. Since the only coupling between the frequency determining circuits and the output is via the electron stream (hence—electron coupled) and also that the output is always made f $\times$ 2, the effect of external loading can be made negligible.

The foregoing, of course, is nothing new, and in fact is a well-established virtue of this type of oscillator; but perhaps the point which has not been fully realised is that one valve can be made to provide sufficient output of stable frequency, where two or more are generally employed in more ambitious designs.

The saving in power consumption, components and materials is considerable; regarding space, the writer used on the operating desk a VFO measuring 6 in. $\times$ 5½ in. $\times$ 5½ in.

Calibration Accuracy

If due attention is paid to the quality of tuning capacitors, rigidity of coils, correct adjustment of anode and screen voltages, and the points mentioned in (*b*) above, then it should be possible to attain an accuracy of $\pm$ 0.02 per cent. The writer employed a 15$\mu\mu$F bandspread capacitor in parallel with a band set of the order of 200$\mu\mu$F, which was arranged with a given value of **L** to tune exactly from 14 to 14.4 Mcs (i.e., 7-7-2 fundamental) over 180° of dial. This arrangement gave an excellent linear relationship between dial reading and frequency, since only 7 per

(*Contd. on p.* 358)

TALKS ABOUT VHF

by H. E. SMITH, G6UH

Mixers (using some of the more common valves)

Last month we dealt with the EF54, EF50 and Z77 when used as RF amplifiers at 144 Mcs. When a valve is used as a mixer, the equivalent noise resistance figure is not quite so important as the mixer noise may be referred to the grid circuit of the previous stage. In other words, the noise generated in the mixer circuit is usually masked by the noise from the RF stage or stages. This does not mean that any type of valve can be used as a mixer, but it does mean that when a certain type is unsuitable for use as an RF amplifier it may be possible to use it as a mixer. For instance, the Z77 wired as a pentode, is not particularly suitable as an RF amplifier as it has a noise resistance figure of 1000 ohms. When preceded by one or two GG stages, the Z77 will give an excellent performance as a mixer, provided that the oscillator injection is made via a small capacitance (2-pF is usually sufficient) to the grid. (Fig. 1 shows a Z77 mixer circuit for 144 Mcs.)

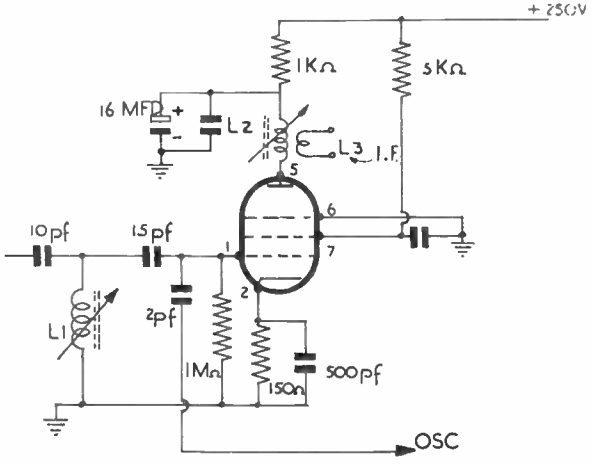


FIGURE 1. Z77 MIXER FOR 144 MC/S

RA191

L1. Three turns 16-SWG on 3 in. former, dust iron tuned.

L2/L3. IF coil and coupling link. (Turns dependent on frequency chosen.)

The EF50 and EF54 are both efficient as VHF mixers. The EF54 in particular, when triode connected, is as good as the best of the B7G based types. The EF54 operates best as a mixer when cathode coupled to the oscillator as shown in Fig. 2. In a cathode-coupled circuit, the oscillator should not be allowed to oscillate too strongly, as IF instability may result. Methods of controlling the oscillator voltage will be dealt with in the next article, which will also deal with various types of VHF local oscillators. Modulation hum in VHF converters is one of the most difficult faults to cure. Most of the blame is usually put on to the oscillator, and in many cases this is true, but quite often it is due to insufficient decoupling of the mixer stage. All mixer stages should be well decoupled as shown in Fig. 3.

The EF50 operates best as a mixer when used as a pentode, and although very slightly noisier than the EF54, will provide a good stage gain. Unlike the EF54, the EF50 prefers oscillator injection via the grid, as per the circuit given in Fig. 1.

Several letters have been received recently regarding the suitability of certain types of valves for VHF work. Most of these can be answered in one sentence. Never, in any circumstance, use octal-type valves in a VHF converter if you expect good results. Some beginners seem to think that because the VR65/SP61 was used as an RF amplifier and mixer in the R1132 VHF receiver (90-125 Mcs) it will be OK to use it for 145 Mcs. This is not the case, as the maximum frequency for operation at 100 per cent. efficiency is 100 Mcs. Although it was used in the R1132, it must be

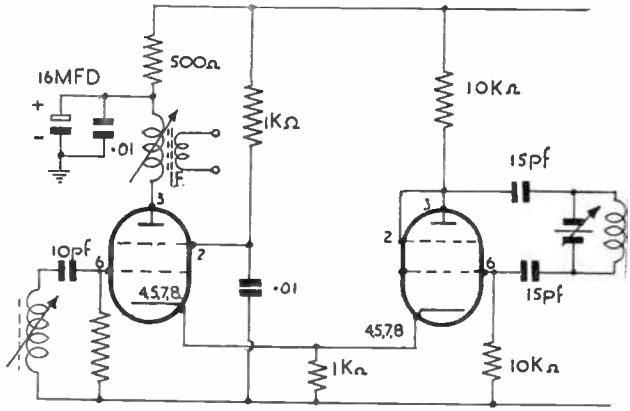


FIGURE 2 2 EF54's IN A CATHODE COUPLED MIXER/OSCILLATOR CIRCUIT FOR 144 MC's RA192

remembered that this receiver was used for comparatively short range work from air to ground, dealing with strong signals most of the time. Remember also that there is a tremendous difference between 125 and 145 Mcs ! If you cannot run to the EC91/6J4 or the ECC91/6J6 or the 6AK5, use the EF54/VR136 in any or all stages of the converter. The Z77 runs in a good second place, and if triode connected will give results very nearly as good as the 6J4.

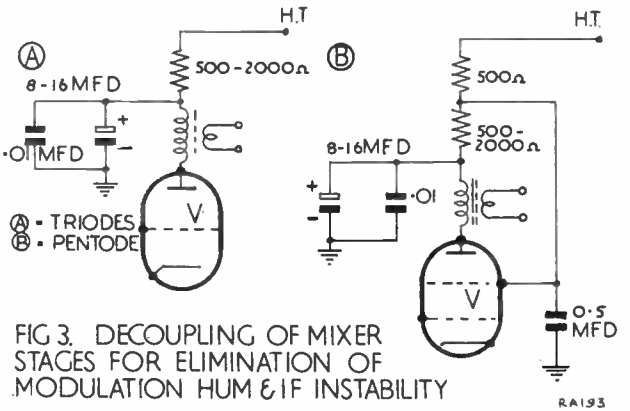


FIG 3. DECOUPLING OF MIXER STAGES FOR ELIMINATION OF MODULATION HUM & IF INSTABILITY RA193

Values given are suitable for any type valve

ON BEING AN XYL OPERATOR

MARIA MONTEIRO

CTIYA

For almost three years I have been a radio amateur. At the beginning I worked as a second operator, but a few months later I decided to get my own call and have a small station of my own.

I can't say that I became a radio amateur willingly. My husband had been one for quite a long time and as we often had quarrels because he wanted to stay at home and do some QSOs while I wanted to go to the cinema, he decided to try and interest me in the hobby. At the beginning I was reluctant, but little by little, I became interested and one day, knowing that it would give him pleasure, I made up my mind to prepare myself for the exam which would enable me to operate.

Often, I had heard my husband making QSO's with other foreign stations and thought it very easy, but when at last I got my licence and was able to speak at the microphone, I found myself at a loss for words. I can't remember the call sign of the station which was in contact with CTIJM (my husband) when he handed me the mike. All I can say is that at that moment I couldn't think of a single word and had to ask him to suggest something to say. I quite believe that I spoke about the weather, because when someone is asked to speak and doesn't know what to say, the subject universally chosen is: the weather or pass me the salt please.

After hearing one of my present QSO's it is almost unbelievable that I was once microphone shy, but it is true. I was as deeply affected by the disease as anyone else.

Little by little I got used to saying first a few words and afterwards to having long QSO's.

It seemed incredible that I, who had been so much against amateur radio, had become in a short time crazier than most of the amateurs and from morning till late at night I could be heard either on 10 or 20 metres.

At the beginning I used to work 10 metres during the daytime and towards the evening, when this band closed, I changed to 20 metres.

Many long and interesting QSOs have I had since March, 1950, and I should like to relate some of the more interesting, but although many people say that to write is the same as to speak, I don't agree with them. In my opinion, it is much more difficult to write than to speak, but as I have started with this task, I'll go on with it and try to tell you as well as I possibly can the most interesting QSOs I have had since then.

One thing I can't forget is the kind way I have been treated by all amateurs, all over the world and to all of them go my sincerest thanks. Some helped me to work under better conditions, giving me hints about aerials, modulation systems, etc., and when I was on

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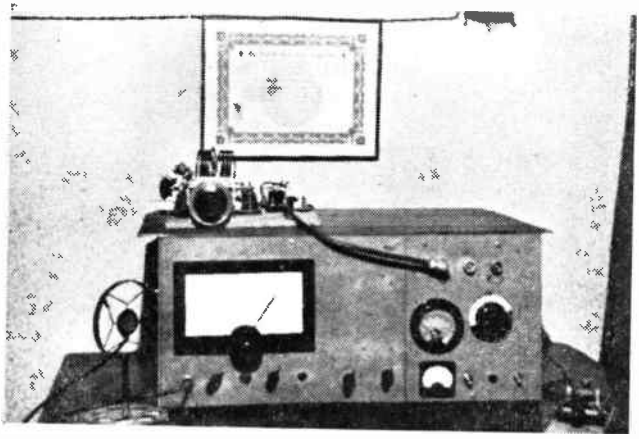


THE BAND HOPPER

A multiband bandswitching phone/CW transmitter designed for maximum flexibility on the communication bands

by E. KALEVELD, PAØXE

After several years of DX-ing as well as ragchewing, the need was felt for a transmitter which would allow both methods of operation. In designing this rig, the following points were kept in mind:

An output of about 50 watts would be sufficient to work all the DX there would be, according to previous experience.

For the sake of flexibility the Tx should employ full bandswitching, the only tuning-controls being the VFO dial, the final tank circuit and the antennatuner.

The Tx should operate on the 80, 40, 20, 15 and 10 meter bands.

For CW, full break-in with very great stability without chirps or tails should be aimed at, for the sake of ease in ragchewing.

To keep down cost, the fone part could be narrow-band phase-modulation, avoiding any possible TVI or BCI troubles. Previous tests had shown NBPM quite capable of performing very well on both DX and local work.

The output should be variable between a few watts and maximum.

These were the main design considerations on top of which came the necessity to build the rig as compact and with as few parts as possible.

The outcome of many sleepless nights was at last the rig to be described, of which the only drawback is that it took away the necessity for the writer to change anything in this rig forever, as far as forever goes, designing and changing being another great hobby here.

The VFO is a conventional Clapp circuit, with the omission of the grid condenser for the sake of stability. This Clapp swings on a frequency of 1.75 Mcs; the cathode current of the EF50 oscillator valve being only slightly over 2 milliamps.

Keying is done in the oscillator screen. This gives absolutely clickless keying without the notorious time-lag filter, while even on the eighth harmonic on 144 Mcs not a trace of a chirp or a tail could be detected. Given the use of good components and common-sense rigid building the stability of this VFO can be made excellent. The frequency-determining parts are enclosed in a metal screening box, as a shield against heat from valves, etc., as well as an RF shielding against the output-frequency.

The EF50 buffer stage following the VFO is conventional. To keep this valve strictly in Class A the grid circuit is broad-band tuned to 1.8 Mcs by means of a resonating choke. The screen is stabilized by the same 70-volts stabilizer as the VFO.

Choke coupled to this buffer plate is the high-mu phase-modulator. This modulator, which is very easy to adjust, employs a 9003 strapped as a triode.

As a speech amplifier a double triode—a 6SN7GT was available and therefore used—gives sufficient gain from even a low-output crystal mike to allow sufficient deviation on the lowest output frequency, i.e., 3.5 Mcs.

A 6V6GT is the doubler valve, which drives the final (807 or similar) on 3.5 Mcs far into Class C. The anode of the 6V6GT is tuned to

3.5 Mcs by means of a resonant choke, which is adjusted with its iron core to a resonant frequency of about 3600 kcs, with the final amplifier connected, of course, to allow for the grid cathode and other stray capacities in this final stage. This resonant choke has a sufficiently broad characteristic to give an equal drive from about 3500 to 3700 kcs. As the drive above the latter frequency can be brought to the correct value by means of the potmeter in the 6V6GT screen, no need was felt to compensate for this by means of much-harder-to-make broad bandpass filters.

This 6V6GT screen potmeter is the drive-control for all bands. It allows the output to be " screwed down " to a few watts, a real boon to the other inhabitants of the band when working locals. And, incidentally, you will be surprised what QRP on DX bands can do for you !

All doubling, tripling or quadrupling for the other bands, 7 to 28 Mcs inclusive, is done with only two valves, with plenty of drive to spare, for the final.

On all other bands then 3.5 Mcs the 3.5 Mcs output from the 6V6GT is connected to the grid of a 6AG7 valve. A 30-pF trimmer from this grid to ground compensates for the larger final input capacitance.

For 7 Mcs the 6AG7 doubles, delivering its output frequency straight to the final grid.

When working 14 Mcs, this 7 Mcs energy is capacitively coupled to the TT 11 grid, which again has a little air trimmer in its grid to compensate for the final grid capacitance, as stated earlier.

This TT 11 doubles on all bands, for which it is used, as all valves with tuned circuits in plate and grid do, so that there is no need to worry about TPTG oscillations.

For 21 Mcs the 6AG7 triples from 3.5 to 10.5 Mcs, while the TT 11 again doubles to 21.

On 28 Mcs the 6AG7 quadruples, and delivers its 14 Mcs to the TT 11 doubler.

It was found necessary to tune the anode of the TT 11, in order to obtain sufficient drive on the full width of the 14, 21 and 28 Mcs bands; moreover, this gave an additional possibility to reduce the drive on 14 Mcs, where there is so much drive to spare, that even with zero volts on the 6V6GT screen there is still an appreciable input. The disadvantage of this additional tuning control is only slight: for changes in frequency of less then 150 kcs on 14 Mcs it need not be touched whereas the coils for the three highest frequency bands can be made so that resonance occurs at the same setting of this tuning condenser for all three bands. This setting should be as much near minimum as possible to obtain sufficient drive over the whole of the 28 Mcs band.

The coils for 21 and 28 Mcs are air-wound, and mounted directly on the switch.

One word of warning however, as far as the operation of this multiplier unit is concerned: if you don't already posses one, borrow, beg or steal a grid dipmeter, for you are almost certain to get lost in all kinds of spurious resonances. If the 6AG7 quintuples instead of quadruples, you get a very nice output on 35 instead of 28 Mcs and I have yet to meet the man who can *see* the difference between a 14 and a 17.5 or a 28 and a 35 Mcs coil !

The adjustment of this unit is best done by measuring grid-currents of the various multiplier stages and the final, with the final connected of course.

After a preliminary tuning of the various coils with the aid of a grid dipper the 3.5 Mcs coil is first brought to resonance by observing final grid current on 3600 kcs. After switching the unit to 7 Mcs, the 6AG7 grid current is peaked on about 3575 kcs by means of the grid-to-ground air trimmer. The 7 Mcs output coil is tuned to a resonance of about 7075 kcs as indicated by the final grid-current.

In the 14 Mcs position of the switch the grid current of the TT 11 is first measured and by means of the grid-to-ground trimmer brought to maximum on 7075 kcs again. For 21 Mcs the coil for this band is resonated on 10.6 Mcs and for 28 Mcs on 14.2, as indicated again by the TT 11 grid current.

Resonating the TT 11 output coils is done once again by measuring and observing the final grid current, taking care that all resonances occur at the same condenser setting, as explained previously.

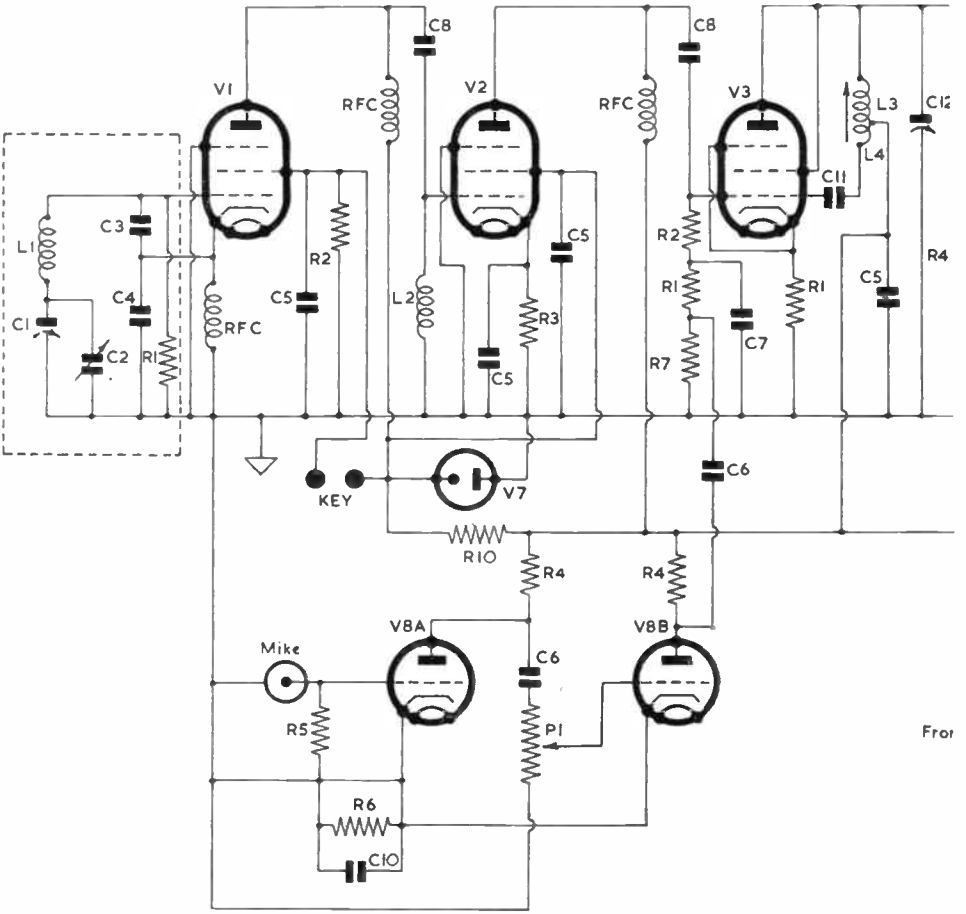
The final is designed for a valve in the 807 power class. The writer used an ex-German Army type, an RL12 P50, which has a slightly higher power rating than the ubiquitous 807.

The grid circuit is conventional. To overcome the difficulties of fixed grid bias a relay valve is used. In American publications a 6Y6GT is invariably indicated for this function, because it has a very low Ri. This valve is, however, much scarcer and much more expensive than the 6V6GT or an equivalent type, whereas any tetrode or beam-power valve can be used for this job. By giving the screen a higher tension than the anode, the Ri can be lowered to a suitable value, but care should be taken not to exceed the dissipation of the valve.

The anode circuit employs a multi-band tuner. On 3.5 and 7 Mcs the circuit resonates with the larger coil and both sections of the split-stator condenser in parallel. The smaller coil can be neglected on these frequencies, and it can be seen as a direct connection from the one half of the split stator to the anode.

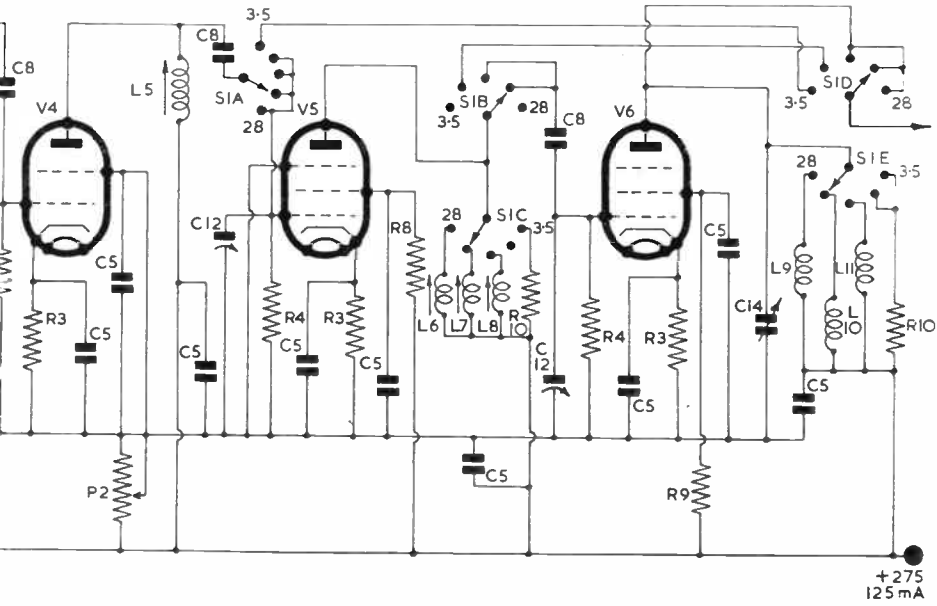
Resonance occurs on 3.5 with the condenser nearly fully meshed, and on 7 Mcs with the condenser near minimum capacity.

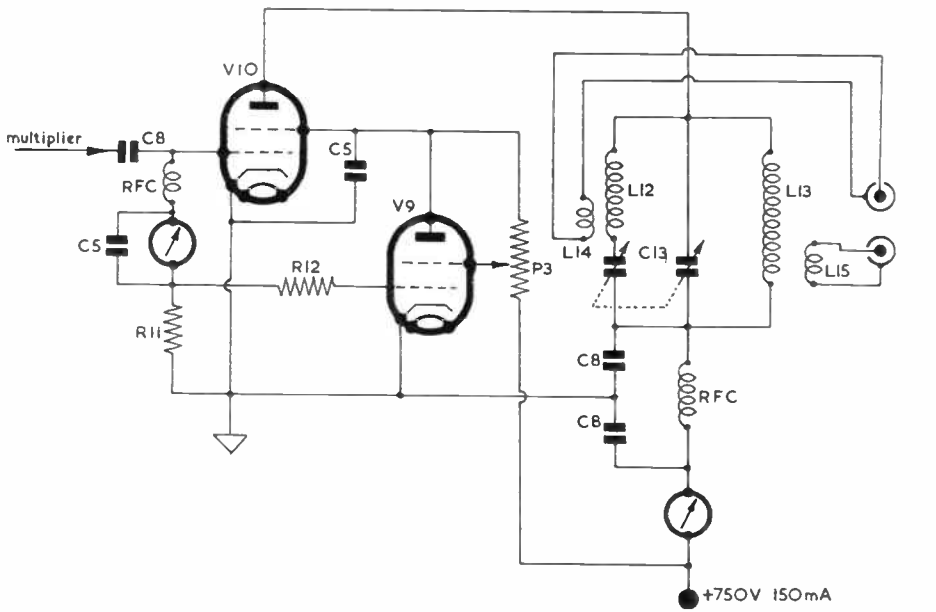
At 14 Mcs and higher, the reactance of the smaller coil becomes important and the circuit

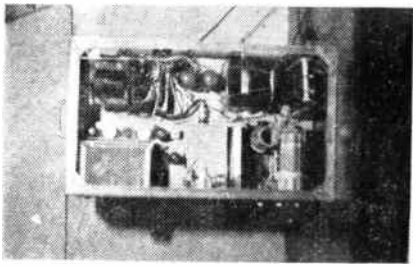


BANDHOPPER

RA156







becomes a very complex one, consisting partly of series and partly of parallel resonance. 14 Mcs is found near maximum, 28 near minimum capacity, and 21 in between.

It is important that the difference in minimum and maximum capacity of the split stator tuning condenser be as large as possible; a very small minimum capacity is a necessity. In wiring and mounting this could be kept in mind: the split stator should not be mounted too near to the metal chassis or any metal screening. A very suitable condenser, which can be used safely with plate voltages exceeding 1000 volts is the split stator used in the T 1154 Army-surplus transmitter.

When other split stators are used, it may be necessary in order to bring the useful tuning capacity (maximum minus minimum cap) to the required 120 pF to change the metal final plates which contain the ball bearings into perspex ones, thereby lowering the minimum cap effectively.

The coils should be mounted at right-angles to each other and one winding of the smaller coil should be left loose for final adjustment. It is important that resonance at different frequencies should not occur at the same condenser settings, e.g., 7 and 28, or 3.5 and 14 Mcs. Should this occur, then one of the resonance points can be shifted by varying one of the inductances, i.e., by moving the loose turn.

There are two coupling coils, one for the two lower, and one for the three higher bands. These are brought out to the front panel by coaxial fittings.

The final should be carefully built and shielded, to prevent self-oscillation. No provision is shown for the suppression of VHF parasitics. The normal rules for any power tetrode or pentode output stage apply here.

Power packs are normal, and not shown in the diagram.

The rig with its power supplies is built in a metal frame, covered with plywood, so that a fully-enclosed foolproof transmitter results, matching a commercial receiver of AR 88 model, and neat enough to take its inconspicuous place in the living room.

Changing from fone to CW is done by means of a key plug, disconnecting the modulator plate from the phase modulator grid, and changing from one band to another, inclusive tuning the antenna unit, takes less then 15 seconds.

It is a real pleasure to hop from band to band, following the conditions in a contest, now to indulge in a 3.5 Mcs phone chat, then 20 seconds later to be calling CQ-DX on 21, when this band suddenly is discovered to open up.

COMPONENT VALUES

C1 140 pF airtrimmer.
C2 25 pF air tuning cond.
C3 1000 pF mica.
C4 1000 pF mica.
C5 bypass cond. 5000 to 10.000 pF mica.
C6 10.000 pF paper.
C7 5000 pF paper.
C8 100 pF mica.
C9 1000 pF 1000 v. wkg. mica.
C10 25 pF.
C11 2 pF.
C12 30 pF compression type trimmer.
C13 split stator 145 pF.
C14 25 pF air variable.
R1 25 k. R2 50 k. R3 600 ohm. R4 0.1 Megohm. R5 5 Megohm. R6 1 k. R7 0.25 Megohm. R8 20 k. R9 5 k, 2 w. R10 5 k, 5 w. R11 30 k. R12 10 k.
P1 0.5 Megohm pot., deviation control.
P2 50 k wire wound output control.
P3 20 k 10 watt semi-variable.
S1 5 position, 5 contact ceramic switch.
RFC 2.5 Megohm choke.
V1, V2, EF 50. V3 9003. V4, V9, 6V6 gt. V5, 6AG7. V6, TT11. V7, VR, 75/30. V8 6SN7 gt. V10, 807.

COIL TABLE

L1 75 turns No. 30 SWG close wound on ribber former 1-in. diameter. Frequency 1.75 Mcs.
L2 160 turns 42 SWG scramble wound, $\frac{3}{16}$ in. diameter former. Frequency 1.8 Mcs.
L3 140 turns 42 SWG close wound in two layers. $\frac{3}{16}$ in. dia former.
L4 35 turns 42 SWG wound under L3.
L5 75 turns 30 SWG for 3.5 Mcs.
L6 10 turns 30 SWG on iron core former, close wound. Frequency 14 Mcs.
L7 25 turns 30 SWG. Former as above. Frequency 10.5 Mcs.
L8 32 turns as above for 7 Mcs.
L11 12 turns as above.
Note : L3 to L11 wound on iron cored formers, close spaced. The 13/36-in. diameter Aladdin type will do.
L10 10 turns 18 SWG $\frac{1}{2}$ in. diameter. 1 in. length. Air spaced.
L12 6 turns 14 SWG 2 in. long, 2 in. diameter.
L13 14 turns as L12.
L14 3 turns at cold end of L12.
L15 9 turns at cold end of L13.

BROADCAST BANDS REVIEW

All Times G.M.T. "Nf" New Frequency. by J. FAIRS

EUROPE

Switzerland. The European Service of the Swiss Broadcasting Corporation is being radiated in the 75-metre band, and will continue until the autumn. These transmissions are experimental (350 watts output) and are in addition to the regular frequencies of 6165 kcs (HER3) and 9535 kcs (HER4). A three-day cycle is operated, commencing with HER22 on 3961 kcs, the following day HER33 on 3981 kcs is used, and HER44 on 3989 kcs the third day. (*World Radio Handbook* and *Sweden Calling DXers.*) Several readers have logged these transmissions, including Arthur E. Lewis, London, Roy Patrick, Oldham, Bill Griffith, Ashtead and Sidney Pearce, Berkhamsted. If the schedule continues in the above order until these lines appear, it should be over HER22 on 2nd, 5th, 8th September, etc.; over HER33 on 3rd, 6th, 9th September, etc.; and over HER44 on 1st, 4th, 7th, September, and so on. All are Nf's, of course.

The United Nations Information Centre, Geneva, now uses HED5 on 9545 kcs, instead of HBQ, 6675 kcs. (*Radio Sweden.*)

Germany (Federal Republic). The 5980 kcs outlet of " Deutsche Welle " is to be changed again shortly, as too much interference is being experienced. (WRH. From personal observations, we would have considered the original 6270 kcs channel to be quite definitely the better of the two ! Scribe.)

England. Roy Patrick and Bill Griffith both report the new BBC outlet on 3970 kcs heard in the evenings carrying the European Service. This is presumably a move from 2880 kcs of GRC. Arthur E. Lewis has logged the BBC on 15400 kcs (Nf) around 1115.

Netherlands. " Radio Nederland " has abandoned 6025 kcs in favour of 5980 kcs (Nf). (" Radio Sweden.") This new channel was found to be completely unreadable recently during the evenings, for NWDR on the same frequency, while Warsaw was S9-plus on 6025 kcs at the same time. (Scribe.)

Trieste. The British Forces Station, British Element Trieste Force, on 15125 kcs, is again in the news. Patrick Cody of Roscrea, Co. Tipperary, Ireland, lists this station with good signals at 2100 to sign-off at 2300; the address for reports is now announced, and is " Technical Section, British Forces Radio Station, Trieste." Letter verifications state that the transmissions are still in the early experimental stages, and are the only service operated on Short-wave. The allocated channel is that formerly occupied by the FBS in Malta. The schedule is 1600-2300 daily, although this is not rigidly adhered to during the present testing period. The service is intended for comparatively local reception, and DXers may find that their future listening conditions will deteriorate as final adjustments are made to the aerial system. (John Whitington, Worthing, Roy Patrick, Bill Griffith and Scribe.)

Spain. " Radio Albacete " has been heard on 7462 kcs (Nf) around 2200-2230. (" Sweden Calling DXers.") A station located at Leon, and probably " Radio Falange de Leon," has been logged on 6950 kcs (Nf) closing at 2300. (Scribe.)

Portugal. " Emissora Nacional," Lisbon, is heard on 15042 kcs (Nf) around 1100-1130 carrying the Overseas Service. This appears to be a move from 15125 kcs, listed as CSA36. (Arthur Lewis and Scribe.)

AFRICA

Tangier. Edward Classe (Vienna, Austria) has been hearing " Pan-American Radio " on 14500 kcs around 2300. This is hardly a new frequency, as it is listed " under construction " in the current edition of WRH, but this is the first report we have received of it actually being in use. Ted has already received a QSL from the station, and they confirm that they are now broadcasting on 14500 kcs. Carl Shapiro, Belfast, mentions " Pan-American Radio " on 7290 kcs, Q4 S5-8 with the identification in Spanish and English at 2245.

Egypt. Cairo is testing a new powerful transmitter on 9615 kcs, and is heard at 1715-2130 when directed to Europe: announcements are in French and English. (WRH.) This must be another of the new 100 kW jobs.

French Morocco. The " Voice of America " frequency schedule always lists the 7220 kcs (ex-7214) channel as " Tangier-10 Beamed to North Africa (RABAT/RDF)." We have not quite decided on what the " RABAT/RDF" signifies, as QSLs from " Radio Maroc," Rabat, have always included this frequency in their list of stations, and according to

" Sweden Calling DXers " this is still the case. Sidney Pearce has done a sport of listening on 7220 kcs, and found this transmission signing-on at 1200 to close at 1400; the first hour is in Spanish, the second in French, and the indentification following the time signal at 1300 is " Ici Rabat, Radiodiffusion Marocaine." The explanation must be that VOA Relay Station Tangier-10 is actually rebroadcasting " Radio Marco " programmes. Can anyone confirm, please ?

NEAR EAST

Kuwait. Stanley Coppel of Belfast tells us he has got a QSL from Radio Kuwait on 5000 kcs, and, in view of our rather pessimistic remarks on the subject of verifications from this station in the July " Review," asks if he is " one of the lucky ones, or have they changed their present policy ? " Well, Stanley, we think you *are* lucky, but maybe your QRA has something to do with it ! However, we would be very interested to know if anyone else has got one fiom Kuwait, especially DXers in this country. By the way, OM, what do they say in your verification ?

ASIA

China. A new Chinese station has been discovered by W. Blanchard, VS1EV, in Singapore. It operates slap in the middle of " 20 " on 14216 kcs, and in parallel on 17684 kcs. Times are very irregular, but are approximately 0030-0230 and 1100-1400. With the aid of a Mandarin-speaking friend, these transmissions were identified as belonging to the internal services of the Communist Chinese Radio, and the transmitters are located at Canton. The programmes consist of Communist indoctrination lectures for the benefit of classes held for this purpose in every town and village, the classes copying down the slowly-dictated speech in Mandarin dialect, the official language of Communist China.

Thanks a lot for your letters, VS1EV. We admit the fault of having to describe a language as " Chinese," but then, in many cases, can only quote from the information available; we shall have to try and remember to insert the word " dialect," and would be very pleased to have a friend who speaks Mandarin !

India. The External Services of " All India Radio " are using 9590, 9740 and 11855 kcs—all Nf's. The broadcast for the West Indies at 2330-0030 is now aired over 7170, 9570, 11950 and 15290 kcs. (WRH.) The English programme for South-East Asia at 1330-1445 is now heard on 15380 and 11780 kcs. (Sidney Pearce.)

Afghanistan. " Radio Kabul " is listed on 9980 kcs by Ron Young, Chelmsford, and heard at 1645 to close at 1704; signals were Q3 S2 and accompanied by much static.

Malaya. " Radio Malaya," Singapore, is no longer operating on 7200 kcs, but is using 4820, varying with 4825 kcs, instead. (W. Blanchard.)

Indo-China (Vietnam). Ron Young sends along the current schedule of " Radio France-Asie " he has just received. Here it is. 2330-2400 on 7230 kcs, and 0130-0200, 1400-1615 on 11935 kcs, beamed to India and South-East Asia; 0845-1015 on 15430 kcs for Australia and New Zealand. News bulletins in English are read at 0130, 1000, 1400 and 2330.

The full schedule of " Radio Hirondelle," Hanoi, is: 2330-0200, 0500-0730, 1100-1700 weekdays; 2330-0300, 0500-1130, 1200-1700 on Sundays. Frequencies are 4403 (Nf) and 7408 kcs, both of 1-kW power. (WRH.) The call for this station is " La Voix de Forces de L'Union en Indochina du Nord," and the QRA is " 63 Boul Boudard de Largee, Hanoi." (*New Zealand DX Times.*)

Taiwan. Sidney Pearce has collected a QSL from " The Voice of Righteousness," Shih-Lin, Taipeh, heard on 7400 kcs. They say " Our station broadcasting are both Chinese and English (7300 kcs, former 7400 kcs) 2200 GMT to 0100 GMT in English and rest Chinese." Oh well, we know what they mean, anyway ! Reports on the English broadcasts are requested. It seems that the schedule given in our June " Review " has been altered or extended, but in any case, the times then quoted must have been in Taiwan Time as we suggested. (Scribe.)

Thailand. Bangkok is heard with strong signals from the 50 kW Tx HSK9 on 11700 (Nf) and 6010 kcs in parallel at 1000-1200; English is at 1000-1115, with news at 1015, and Malay at 1130 to sign-off. (Arthur Cushen, Invercargill, New Zealand.)

PACIFIC

Pitcairn Island. This British Colony of two square miles and a population (in 1949) of 135, is to have a radio station of its own. The station is in the course of erection and should be ready for service shortly; the MW call-sign will be ZBP and a SW Tx will also operate. (WRH.)

Philippines. The Committee for Free Asia Inc., Manila, have sent a letter veri to Sidney Pearce for reception of DZI7 on 11940 kcs, which was announced as DZI5 when heard: see the April " Review." The broadcasts of " Radio Free Asia " on SW definitely terminated on April 30th, which confirms the previous report from WRH.

Guam (Mariana Islands). KUJ39 Agana on 9490 kcs, which relayed " Radio Free Asia " programmes, also concluded these transmissions on the above date, according to an air mail verification from Manila. (*New Zealand DX Times.*)

Australia. Ron Young sends along the new schedule of " Radio Australia " programmes, which came into operation on the 1st August. It is much too lengthy to repeat here in full,

but we note that while programmes to South and South-East Asia have been extended, there is now only one transmission beamed direct to the British Isles: 0645-0815 over VLA9, 9580 kcs. VLB11, 11760 kcs, also carries this programme for southern Europe at 0659 (0745 Sats.) to 0815, and makes a possible alternative for reception in the UK.

Dutch New Guinea. Hollandia is using both 5045 (Nf) and 7126 kcs at 0930-1130; news in Dutch is usually on the air at 1000. (Arthur Cushen.)

New Caledonia. " Radio Noumea " is now using 6028 kcs (Nf) and is heard in Australia opening at 0700. (" Radio Sweden "). The last frequency reported for Noumea was 6000 kcs, and the one before that, 6035 kcs.

Tahiti. " Radio Tahiti," Papeete, is using 6980 kcs again, and has been heard with Tahitian programmes to 0515, then in French to 0630; the 6135 kcs channel is now inactive. (Arthur Cushen.) We feel sure that all readers will join us in congratulating Arthur Cushen on his recent award of the Queen's Coronation Medal, in recognition of his untiring efforts as a BBC Observer for 14 years, and for the self-imposed task of conducting through two wars the Prisoner-of-War Monitoring Service of the New Zealand Radio DX League. Good work, Arthur.

NORTH AND CENTRAL AMERICA

United States. The " Voice" of America, has cancelled the contract to operate 12 SW transmitters, in an attempt to cut costs. The transmitters which no longer relay the VOA programmes are owned by the World-Wide Broadcasting System, Boston (WRUL, five Tx's), Associated Broadcasters Inc., San Francisco (KWID, two Tx's), General Electric Company, Belmont (KGEI, two Tx's), The Crosley Broadcasting Corporation, Bethany (WLWO, two Tx's), and Westinghouse Radio Stations Inc., Hull (WBOS, one Tx). The VOA now operates 30 Short-wave transmitters, 16 of their own, six are privately owned, and eight jointly owned; all are using between 150 and 300 kW. The Relay Station at Munich is to commence operating soon with an increased power of 1000 kW. (*New Zealand DX Times.*)

Mexico. XEQQ Mexico City, 9680 kcs, is back on the air again but on an irregular schedule, and relaying MW stations XEQ and XEX which appear to have merged, (August " Review.") XEXE on 6065 and 11900 kcs is also now carrying the same programmes on both frequencies. (Marvin Robbins, Indianapolis, USA.)

XEWW " La Voz de la America Latina," Mexico City on 9500 kcs was S9 recently around 0550. (Arthur Lewis.)

Costa Rica. TIMC " La Voz de Guanacaste " at Liberia is now reported on 6074 kcs (Nf, ex-6200). (WRH.) The slogan on their letterhead is " Radio Guanacaste " however, and the letter was signed by Emilio Marin Blanco. (Robbins.)

Station TIHH " Radio Athenea " at San Jose is also reported to have moved from 11972 to 6744 kcs (Nf). (WRH.)

Panama Republic. Station HORT " Radio Balboa," Panama City, 6065 kcs: S7 signals at 0400. (Bill Griffith.)

Haiti. " Radio Commerce " located at Port-au-Prince is a new station on about 9487 kcs. " Radio Sweden " lists the call-sign as 4VE, the frequency as 9484 kcs, and the QRA as " Radio Commerce," P.O. Box 94, Port-au-Prince. Sidney Pearce hears this station near 9490 kcs with good signals and test programmes from 2200; English announcements have been heard, " This is Radio Commerce testing in the 31-metre band," and reports are asked for, at the address given above. Our own log includes this station, and signal strength and modulation are both very good, especially after 2300. In fact, these are the best signals we have heard from Haiti for years; if this is another of those 100-watt jobs, their antenna must be remarkably efficient and beamed " spot-on " Yorkshire. Hi. Identification is announced in French every 15 or 20 minutes, and usually runs: " Ici Radio Commerce . . . a Port-au-Prince, capital de la Republic d'Haiti . . . Radio Commerce . . . Programme Nationale . . . " Lots of Spanish, Latin-American and French popular music are included in the programmes.

4VEH Cap Haitien has been heard several times on 9525 kcs (Nf) around 2400. (*Universalite*, bulletin of the Universal Radio DX Club of California.)

Curacao. Station PJC2 Willemstad is now using 6677 kcs (Nf) in parallel with the 2460 kcs outlet. (WRH.) This will be the same Tx which used to work on 5017 kcs.

Guatemala. TGNA Guatemala City, 9668 kcs, has been discovered at 0400 with a Bible Quiz, playlet and organ music at 0430 to close at 0445. (Ron Young. Rx. AR88.)

TGDA Quezaltenango on 7470 kcs is reported heard when signing off at 0530 on Sundays. (*New Zealand DX Times.*) The call for TGDA is " La Voz de Occidente."

Nicaragua. A new station on 6199 kcs, located in Managua, capital of the republic, has been found by several listeners on both sides of the Atlantic. URDXC reports the call as " En Managua, Nicaragua, Radio New . . . " and a cock crows at identification time. " Sweden Calling DXers " quotes the call as " Radio Mil." Stanley Coppel includes it in his log this month, Q3 S5 on 6200 kcs at 0030, and Sidney Pearce mentions " Radio Mil " but he can't catch the location.

El Salvador. Bill Griffith has received a QSL card from " La Voz Panamericana " at San

Salvador, which gives the call-signs as YSAX on 800 kcs, YSAXA on 11950 kcs, and YSAX1 on 101.1 mcs FM. The QRA seems to just be " Radio YSAX, San Salvador." (Tnx for the confirmation of the call-letters. " Gerencia " means " management ' in Spanish, OM !)

Dominican Republic. Carl Shapiro has been hearing a Dominican station on a varying 6050 kcs which he believes to be HI2A; it has a three-chime signal and announces " La Voz Domincana, La Voz de la Reeleccion," is regularly logged from 2345, and signals improve to Q4 S5-7 by around 0300.

Yes, Carl, HI1N is certainly listed on this frequency, but whether HI1N announces as " La Voz del Partido Dominicana " or " Emisoras Unidas " we don't know for sure—perhaps both slogans are used. HI2A " La Voz de la Reeleccion " has moved from 9680 to 4840 kcs (see last month's issue), and as this station is at Santiago de los Cabelleros, we suggest the announcement of location should be a good guide. HI2A, when we heard it last, had a four-vibraphone-note signal and the call was " HI2A La Voz de la Reeleccion, Santiago de los Cabelleros, Republica Dominicana."

SOUTH AMERICA

Brazil. The call-sign for " Radio Cultura de Poços de Caldas " is PRH5 on 9645 kcs. A new station on 3944 kcs is " Radio Universidade do Rio Grande do Sul " located at Porto Alegre; output is 1 kW. (WRH.)

ZYR31 " Bauru Radio Clube," Bauru (State of Sao Paulo) on 3275 kcs opens at 1000 with QRM from " Radio Trinidad." (*New Zealand DX Times.*)

The frequencies mentioned in respect of ZYR61 " Radiodifusora de Taubaté," Taubaté, in our July issue appear to have become mixed. This item should read: " moved from 4805 to 4855 kcs (Nf)."

Patrick Cody reports PRB23 Sao Paulo, 15135 kcs, heard around 2100. He adds that this station announces as " Radio Panamericana " but sometimes also mentions " Radio Record," and he wonders which programmes PRB23 broadcasts. Well, as far as we can gather from WRH, PRB22 (9505 kcs) and PRB23 both relay PRB9 " Radio Record " on 1000 kcs MW, while PRB21 (6055 kcs) relays PRH7 " Radio Panamericana " on 620 kcs MW. Carl Sharpiro lists PRB21 frequently heard Q3 S5 under a heavy hetrodyne whistle around 0010, and he says the identification is given as " Radio Panamericana " and not " Radio Record." We have noted all these stations to be in parallel on more than one occasion, and though there may be separate programmes at times, we list them all with both calls to avoid confusion ! By the way, as WRH mentions " PRB21, 20, 22, 23/PRH7 " for this network, can anyone give us a frequency for " PRB2O " ? Scribe.

PRG9 on 11805 kcs is reported heard by Ted Classe, who says " no gongs, bells or chimes for this station: just ' Radio Nacional, Sao Paulo, Brasil ' ".

Ecuador. HCJB " La Voz de los Andes," Quinto, have informed Roy Patrick that they hope to move the present transmitters out to the new location at Pifo (18 miles from Quinto) in the very near future. The signal strength should be greatly increased, as a new curtain antenna system will be used.

Falkland Islands. Port Stanley is now using 6100 kcs (Nf) in addition to 3440 kcs (also a Nf—formerly listed as 3400). 580 kcs is the MW outlet. (WRH).

Urugauy. CXA13 " Radio Carve," Montevideo, 6155 kcs, was logged at 2330 by Stanley Coppel, and at 0015 by Carl Shapiro; both readers report Q4 S6 signals in Belfast.

Peru. OAX4Z Lima, 5886 kcs, is sometimes heard around 2300, Q3 S4-5 with lots of sambas in the programme; the signal of two chimes precedes the call " Radio Nacional del Peru." OAX4T on 9562 kcs is also heard in parallel, Q4 S5 at 2315, but later wiped out by Moscow. (Shapiro.) OAX4Z was Q3-4 S6 at 2315 on 5886 kcs. (Coppel.) (Are you two fellows using the same Rx over there in Belfast ? Hi !) A very recent measurement for OAX4Z was 5902 kcs. (Scribe.)

Station OAX4S " Radio San Christobal " at Lima is now on 6203 kcs (Nf, ex-5965). (" Radio Sweden.") These few poor and heavily-burdened kilocycles around 6200 appear to be very popular lately, and judging by the " pile-up " that has taken place during the past few months, we should imagine South American listeners can only hear a S9-plus hetro !

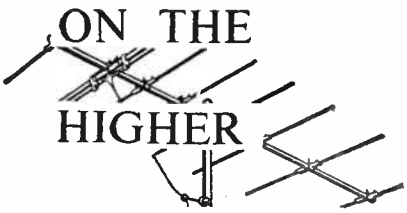
Colombia. An appárently new station is HJEZ " La Voz de Cali " on 6195 kcs. (" Radio Sweden.") HJEZ is listed by Stan Coppel: Q3 S5 at 0025, and by Bill Griffith: S7 to close at 0415. There is a striking similarity here with HJED " La Voz del Valle," Cali, and hope we are not getting 'em mixed !

HJCT " Radiodifusora Nacional," Bogota, is heard on about 6190 kcs with Q5 S8 signals from 0000 to 0400. (Shapiro.) So there is only about 5 kcs between these two Colombians.

Venezuela. Bill Griffith's QSL card from " Ondas del Lago " at Maracaibo shows a view of the aerial across the lake of Maracaibo. The MW Tx is on 1120 kcs with the call-letters YVMF, and 10-kW power. The SW Tx on 4800 kcs now has an output of 7.5 kW to a half-wave dipole, and the call-letters are YVME. These call-letters agree with our original lists; about two years ago someone switched them around, and thus they have remained so, in error, ever since. (Scribe.)

Bolivia. CP6 La Paz, 9500 kcs, was heard

(*Contd. on p. 355*)



Monthly Notes and News

by H. E. SMITH, G6UH

We much regret having to open the proceedings this month with some gloomy news for our VHF readers. Owing to space considerations, the Editor has been compelled to ask your conductor to reduce the VHF feature to three pages instead of the usual five. This comes just at the time when we could do with *more* space. However, we shall endeavour to make the best of a bad job. Everything will be shorter than usual, and we apologise to those reporters who sent in such long and detailed information which we are forced to leave out. Perhaps in the not-too-distant future we shall be allowed our usual space again. Meanwhile, as the Calls Heard and QRG sections seem to be the most popular and the most useful, we shall devote as much space as we can to them.

Transmitter Reports

G4RO (St. Albans, Herts.) who operates on 144720 and 434160, sends in a most interesting first report to these columns. Some of the outstanding contacts of the month include LA2RB, F8GH, F8MX, Gc3EBK, on 2 metres, and Gw2ADZ, G3IOO and G3FAN on 70 cms. G4RO has compiled an "Occupancy List" of the 2 metre band, taken between July 1st and 30th, and showing the disposition of stations over the band. We wish we could reproduce this in full, as it shows that the band is pretty well filled between 144200 and 145400. Only five stations were heard between 145400 and 145700 and five between 144200 145400 and 145700 and five between 144200 and 144000. The most crowded area, as observed by G4RO, lies between 144700 and 144900. The wide open spaces at the HF and suggest that everything possible should be done to encourage all operators in Zone F and Zone D to operate within their correct zones. The British Isles Band Plan for 2 metre working has now been officially recognised by all organisations, and it is up to every operator on the band to make every effort to co-operate in making it work 100 per cent.

The Calls Heard list submitted by G4RO is indicative of the high activity during July.

G5TZ/A (St. Catherine's Down, I.O.W.) is now firmly established on the band again. Your conductor made his annual trek to the Island early in July and carried out a knob-by-knob inspection of the station !

Those who marvel at the high quality Phone which "Old Jumbo" puts out would be equally amazed at the efficient appearance of the gear. We could find nothing but praise for the businesslike set-up. One would never expect to find such an efficient VHF station housed in the crumbling ruins of an old lighthouse, perched at some 850 ft. above sea level, with a view to the French coast on a clear day.

The circuit between Jumbo's QTH and Hayes is not quite so good as it was from Arreton Down in the old 5-metre days, but we can usually manage a QSO, even when conditions are poor. So keep your ears open on 144999 if you want to hear some real hi-fi Phone !

G3WW (Wimblington, Cambs.) has not been very active, as he has been busy trying to get the portable rig going to take away on *another* holiday. The rig is now working well with about 8 watts input. The best DX worked on this rig up to the time of writing is Goole, Yorks, Ilkeston Derby, Colchester and Surrey on CW. On the big rig, G6JK/P at St. Neots was worked, also G4JJ/P near Oakham. F8MX was also worked at his holiday QTH on the coast near Dieppe. When in contact with G3GJZ (Newmarket) who had G3FIJ and G2ANB visiting him, G3WW tried out the portable rig on its own mast (22 ft.) and obtained a report of 57 at 25 miles. Other news from the area is that G2HOP met ON4BZ and PAØFD while on holiday with his wife on the Continent.

G3AGR (Streatham, London) has been active since last January, and as he puts it, came on the band under great pressure from G6TA and G2DUV. Using an 8-element stack on 144890 Mcs, Jack has worked 130 stations in four countries, and hopes to improve on this figure when he gets the aerial up a few feet higher.

G3HZK (Hayes, Middx.) is now operating with a 3-element Yagi at 25 ft., the whole beam only weighing ½ lb. Although no DX has been worked yet all reports seem to up about 12 dbs. Some of the more distant stations heard but not worked include G2FTS, BMZ, XV, WJ, G3BNC, GHO, BKQ, ECV, WS, G5YV, TZ/A and F8MX.

G3AJP (Fritton, near Great Yarmouth) has now got the new beam up (a 4 × 4) at 34 ft., and hopes to make a start with the transmitter in the near future, so *Suffolk* will then have a new station on the air ! (Fritton is actually in Suffolk). John reports that G3CFK made the

first G Phone QSO with LA8RB (LA8RB being on CW). G3AJP could not hear him, although G6NB (who made the first Phone-to-Phone QSO with the LA), G3GHO and G5YV were pounding in. Another new station is active in the area, G3HRW (Acle, Nr. Norwich) operating on about 145600 Mcs. G4KO and G4PV are both active.

Listener Section

With this issue we come to the end of our Listener Award Scheme for the time being. It is with great regret that we have to make this announcement, but as will be seen earlier in these pages, we are compelled to cut the space for VHF matters. As the main object of our scheme was to encourage listener reports, and to build up a solid listener section, there is, at the moment, no point in continuing, if we cannot obtain the space required. *Every* listener reporter this month will receive a useful award by way of compensation however, and we hope that our regular reporters will continue to send in their logs and comments, and your conductor will do his best to deal with them all as fully as possible.

Peter Blair of **Mill Hill** who normally uses a super-regen with RF stage, has now constructed a converter using an EC91 oscillator, 12AT7 mixer/RF amplifier, and is enlisting the aid of G2YC for the alignment. The converter will be used in conjunction with the BC624C and an IF of 12 Mcs. The best DX heard during the month on the super-regen was G5TZ/A.

Ted Stonestreet of **Willesden Green, N.W.2** is another super-regen fan, being without mains supply. An EC52 with heaters supplied from two cycle-lamp batteries in series and a 90-volt HT battery provides Ted with many hours of enjoyment. On the question of re-radiation, exhaustive tests have been made locally, and there appears to be none, either on TV or Radio In case there should be any interference however, Ted confines his listening to the very late hours (11 p.m. and after). Some of the stations heard recently include G2ANT/A, G2AHP, G3GDR, G3GHR, G3GSE, G3FYY, G3HAZ, G3IUE, G3MI, G3HBW, G8OU, not to mention G2HDZ who is the strongest and most persistent station of all.

R. W. Russell of **Shirley, Nr. Southampton** once again sends in a fully detailed and informative report. Reg found the good conditions of the end of June continuing up to July 5th. The period July 6th to 17th, was extremely poor, although stations such as G8OU, G2BMZ and Gw8UH were well heard on their nightly skeds. F8GH has been heard almost every night working locals. The SWM Contest week-end produced G4JJ/P in Rutland, but little else. G5YV can now be received under any conditions, and it will be interesting to see whether he can be received under winter-time conditions. Comparison with signals from G2HCG and G6NB, shows that G5YV's signal is always more reliable, and is not subject to the multi-path fading as are these two nearer stations. Reg says it would be most interesting if G6NB, G5ML and G5YV could arrange to transmit with their beams south at pre-arranged times.

A. W. Blandford of **Mitcham, Surrey** spent part of the month on holiday, but still found time to hear some new stations. A total of 18 new ones have been heard since last report, and the grand total now stands at 548. Nothing new has been heard on 70 cms, and the total still remains at 41. Some of the best stations heard during the period July 1st to 9th, included GwADZ, Gw8UH, G3GOP, G3BKQ, G5TZ/A, G5YV and G8AO/MM. Stations heard during the week-end of July 25th and 26th, will be found in the Calls Heard section.

Harry Parker of **Smethwick, Staffs.** has just started to listen on the 2-metre band. Harry is another keen VHF fan without mains supply in the house, and is forced to use a super-regen at the moment, but a receiver using 6.3 valves is under design and this will be run from batteries. A single 958A acorn triode is being used in a self-quenched circuit with a simple dipole at 25 ft. has so far provided signals from the following, G2NV, AVQ, CVD, FXK, G3BKQ, EQR, HAZ, G5FH, G6SN, G8KL, SC.

An 8-element stack is also under consideration.

Len Whitmill of **Harrow Weald** reports that July 4th, and 28th, were outstanding days, G6OU, G5YV, G3GOP/P, were all S8/9 and F8MX was running a full S9. The outstanding signal of the month was G5TZ/A. In all kinds of conditions " Old Jumbo " has been well heard. Len has also been busy building a new converter of the G2IQ type. This has now been effectively neutralised and is working well. Total of stations heard on 144 is now 508.

Can anyone help !

Alan L. Higgins of 64 St. Brides Road, Aberkenfig, Nr. Bridgend, Glam., South Wales, would like to hear from anyone who has used 954's, 955's and 956's on 144 Mcs. Alan is situated somewhat " in the wilds " as far as VHF is concerned, and would be glad to hear from any other listener. (We forgot to mention that Alan is BRS 15844.)

CALLS HEARD

G3HZK, Hayes. Heard, but not worked :—

G2BMZ, FTS, WJ, G3ECV, BKQ, GHO, WS, G5YV, TZ/A, F8MX.

L. A. Whitmill, Harrow
G2AHP, BMZ, BRR, DDD, DUV, FQP, HCG, HDZ, HGR, XV, YB. G3AEP, AGR, CAT, CGQ, CVO, DIV, EGV, FAN, FIJ, FO, FQS, FSD, FYY, GBO, GDR, GHO, GOP/P, GSE, HAK, HQJ, HZK, ISA, MI, SM, WW, XC. G4KD. G5LC, LK, MA/P, NF, QL, SZ, TZ/A, UD, YV. G6GR, LL, OU, RH, UH, YP. G8OU, WV. F8MX.

R. W. Russell, Southampton
100-150 miles:—G2FZU, PU, XV. G3AEP, ANB, BK, BKQ, GZM, HAZ, IIT, WS, WW. G4JJ/P, MW. G5JO, JU, ML, MR. G6WF. G8AO/MM. SY. Gc3EBK.
150-200 miles :—G2BAT, HQ/P. G3AGA, CFK. G5YV. G8MW.
Over 200 miles :—F8GH.

Peter Blair, Mill Hill
G2AHC, AHP, AHP/A (?). ANT/A, DTO, HDZ, MV, YB, YC. G3CAT, CKX, DJZ, EGV, FB, FQS, GBO, GDR, HAK, HWJ, HZK. G4RO. G5KL. MA, NF, TZ/A. G6JP, OT, OU, WU, YP.

A. W. Blandford, Mitcham
(July 25th, in order of reception.) G5QL, 4SA, 2AHP, 8AO/MM, 2DSW, 2DSP, 3IAM, 3HCU, 3GOP, 5MA/P, 6XH, 8SK, 5YU, 2FTS, 2HDZ, 2DTO, 3MI, 2HIF, 2XV, 3BKQ, 5LC, 8SC, 3FYY.
(July 26th, in order of reception.) G6TA, 3FUH, 5YV, 2HCG, 5DS, 4RO, 8SK, 2AHP, 6XH, 2FUD, 3CGQ, 2YC. 3HZK, 6OU, 2HDZ, 5NF, 6YP, 5WW, 2YB, 3ENI, 2DTO, 2HIF, 3FSD, 5YH, 8AO/Ma, 5TZ/A, F8MX, 2FSY, 3AGR, 3GDR, 5QL, 3EIX, 3FAN, 3HCU, 3ISA, 3WW, 3FFY, 3GHO, 8CK, 3FD, 8OU.

All listener and transmitter reports direct to your conductor at 176 Station Road, Hayes, Middlesex, by the 6th of the month at the latest please. 73 and good luck to all.

G6UH.

QRG SECTION (continued from last month)

Call-sign	*QTH*	*QRG (normal)*	*QRG when last heard*
G3EPW	Bury, Lancs	145395	145395
G3ETI	Wirral, Ches.	144130	144440
G3EUQ	Southampton	145325	144715
G3EYV	Clapham, London	145225	145060
G3FAN	Ryde, I.O.W.	145380	144480
G3FC	Stanmore, Mx.	145220	145220
G3FD	Southgate, Mx.	144925	144805
G3FDV/A	Dawlish, Devon	145040	same
G3FEX	Bramber, Sussex	144905	,,
G3FFC	Leicester	144605	,,
G3FFT	Blackpool	145230	,,
G3FFV	York	144320	,,
G3FGT	Birmingham	144405	,,
G3FIH	Radstock, Som.	145575	145325
G3FIJ	Colchester	145200	same
G3FKO	Bath	145000	,,
G3FKS	Nr. Romford	144740	,,
G3FLP	Streatham, London	144815	,,
G3FMI	Chester	144470	,,
G3FMK	Maidstone	144770	,,
G3FMO	Chard, Som.	145590	,,
G3FOD	Rochester, Kent	144900	,,
G3FOU	Ewell, Surrey	144790	,,
G3FP	Thornton Heath, Surrey	VFO	——
G3FQS	Chesham, Bucks.	144890	same
G3FRY	Cheltenham	144150	,,
G3FSG	Clapham, London	144420	,,
G3FSL	Barnwood, Glos.	145245	,,
G3FTR	Leytonstone	145225	,,
G3FUM	Weston, Som.	145345	,,
G3FUW	Hinkley, Leics.	144470	144220
G3FXG	Brixton, London	144920	same
G3FXR	Birmingham	144475	,,
G3FYR	Feltham, Mx.	145120	,,
G3FYU	Hackney, London	145075	,,
G3FZL	Dulwich, London	144737	,,
G3FZU	Ilkeston, Derby	144160	,,
G3GAO	Torquay, Devon	145465	,,
G3GAV	Winchester	145285	,,
G3GBO	Denham, Bucks.	144790	,,
G3GCX	York	144475	,,
G3GDR	Abbotts Langley, Herts.	145115	,,
G3GEN	Gloucester	145430	144190
G3GGJ	Cambridge	144890	same
G3GGL	Nr. Bradford	144315	same
G3GHI	Purley, Surrey	144865	,,
G3GHO	Nr. Northampton	144820	144670
G3GHU	Northampton	144140	same
G3GMX	———, Cheshire	144412	,,
G3GJZ	Newmarket, Suffolk	144575	,,
G3GOP	Southampton	145450	145025
G3GPT	Southport, Lancs.	144925	same
G3GRA	Barnet, Herts.	144645	,,
G3GSE	Kingsbury, Mx.	145085	,,
G3GSK/A	Chiddingfold, Surrey	144804	,,
G3GUD	Derby	144425	,,
G3GUU	Lytham, Lancs.	144530	,,
G3GVC	Nr. Portsmouth	145320	,,
G3GVF	Basingstoke, Hants.	145405	,,
G3GVL	Derby	144190	,,
G3GW	Sheppey, Kent	145110	,,
G3GWB	Northampton	144885	,,
G3GWR	Windsor (?)	144650	,,
G3GX	Whetstone, Mx.	144810	,,
G3GXO	Hounslow, Mx.	145340	,,
G3GZM	Tenbury, Worcs.	145725	144360 (app.)
G3HAB	Colliers Wood, London	145380	144990
G3HAE	Hounslow, Mx.	144940	same
G3HAK	Reading, Berks.	145280	,,
G3HAZ	Birmingham	144460	144560
G3HBN	Harrow, Mx.	145045	same
G3HBW	Alperton, Mx.	144885	,,
G3HCK	Hurst Green, Sussex	144925	,,
G3HCU	Chiddingfold, Surrey	144915	144805
G3HEA	Bloomsbury, London	144825	144575
G3HII	Liverpool	144168	144400
G3HSC	Wallington, Surrey	144750	same
G3HT	Edgware, Mx.	145200	,,
G3HUQ	Ilford, Essex	145035	145020
G3HVO	Parkstone, Dorset	145210	144155
G3HWC	Preston, Lancs.	144145	same
G3HWF	Yatesbury, Wilts.	145120	,,
G3HWJ	Surbiton, Surrey	145100	,,
G3HXO	Shefford, Beds.	144985	,,
G3HXS	Nr. Tring, Herts.	144520	,,
G3HZF	Nr. Northampton (?)	144890	144815
G3HZK	Hayes, Mx.	144845	same
G3IAI	Northampton	144920	,,
G3IEI	Nr. Kingsclere, Hants	144725	,,
G3IEX	Henlow, Beds.	144680	,,
G3IHH	Arborfield, Reading	144800	,,
G3IIR	Sydenham, London	145375	,,
G3IIT	Cambridge	144800	144500
G3IOO	Oswestry, Shrops.	145580	144200 (VFO)
G3ION	Tetbury, Glos.	145320	144725
G3MA	Cheltenham	144735	145260
G3MI	Chesham, Bucks.	144250	same
G3MY	Derby (?)	144250	,,
G3NL	Malvern, Worcs.	144760	,,
G3IRA	Swindon, Wilts.	145340	,,
G3ISA	Beckenham, Kent	145130	,,
G3ITI	Cottingham, Yorks.	144640	144375
G3IUK	Alverston, Derbys.	144530	same
G3IWA	Bath, Glos.	145307	,,
G3IWJ	Liverpool	144320	,,
G3QK	Pinner, Mx.	144880	,,
G3RI	Southampton	145350	,,
G3SM	Harrow, Mx.	145380	145300
G3SU	Stoke Poges, Bucks	144750	same
G3TF	Tettenhall, Staffs.	145420	,,
G3TN	Portland, Dorset	144170	,,
G3VM	Norwich, Norfolk	144770	144790
G3WS	Gidea Park, Essex	145260	same
G3WW	Wimblington, Cambs.	144825	144300
G3YH	Bristol	145335	145140
G3ZI	Cobham, Surrey	145035	same

(This ends the G3 section of our QRG List. We shall continue next month with the G4s onwards. We should like to thank all those who have written in, contributors and non-contributors alike, expressing their thanks to us for publishing such a complete QRG List, and we can only repeat, as stated in previous issues, that it would not have been possible for us to present these lists without the admirable co-operation of G3BLP who has given your conductor every possible assistance.)

Amateur Bands Commentary

STAN.
HERBERT
G3ATU

The month of July, now happily past, could, we feel, be described as "A DX chaser's glimpse of Purgatory"! Even 20 could produce only the odd opening, while the least said about the other bands, the better. However, as often happens when the bottom seems ready to drop out of our particular world, the first days of August saw things starting DX-wise in a big way.

On August 1st, CR7UU appeared, starting what must be one of the most fascinating one-man DX-peditions ever. The operator is that well-known rare country globe-trotter Jim Jamie, who has already held calls in SU, MI, MS4, EQ3, YA and who is currently active from ST2UU. Jim is on his travels again and has already operated from FB8UU, which created quite a stir and VQ7UU, which created a major upheaval! Not surprising, considering that the VQ7 call was used from the Aldabra Islands, and was the very first amateur station ever to operate from there.

The trip, which is by air, will take in VQ9, VS9 (Oman), ET2 and possibly more rare spots, if permission to land is forthcoming and will be over when you read this. Sorry we couldn't give you prior warning, but we hope you snagged at least some of the rare "UU's." To do so, though, you'll have to rely on Morse.

The other big news is of CEØAA, who, after all those delays, finally hit the air on August 7th. As can be imagined, the pileup around him is pretty awe-inspiring, but the ops have things well under control and will not work anyone nearer to them then some 10 kcs—result, a clear channel.

What's Been Going On

This month we are going to keep your lists as clear as possible of the "Bread and Butter" kind of DX—the sort of thing we all hear almost every time we tune the bands. We shall endeavour to pick out the juicy bits for you. Here we go.

Twenty Metres

D. E. Nunn (Hove) caught a new one on Phone in FF8AP, with ST2NW and HZ1MY (whom we thought had departed elsewhere), in addition.

R. J. Holliman (Cambridge) thought conditions up on last month. He did achieve two new ones at that—ST2NW and 9S4AD—making his Phone score 83C.

R. Goodman (Edgware) takes us to task for wishing an O-V-1 on him last month! Ron doesn't believe in the big stuff—he uses an O-V-0 on all bands and his latest 20 Phone catches were CT3AA, KA2AM, 2IM (1830) and two new ones—CR7KV and KX6BC (1345 and very nice, too).

P. Morgan (Stourbridge), another O-V-0 man, *also* snagged KX6BC (1340), CE's 1AA and 3CZ, HI6AT, 9S4AD and an unidentified PX.

G. H. Elleson (Malvern Link) still pulls in Phone on his old S20. Latest were CP1FY, VP1GM, 3A2AY, ET2CG, VP5AK, AP2N (S7-1730), CS3AB, FF8AP and OA5A, with near misses from ZS9, KH6I and FK8. Too bad, the last ones.

H. J. Hill (Whitley Bay) confesses being sick to death of listening to short skip, knowing that there is good DX somewhere underneath. So he got cracking and dug KX6BS and KA4SV from under a pile of the stuff. Harry tells us the KX6 will be on every Saturday and Sunday, too. Further battling with the splatter experts uncovered EL1OA, OA4BC, OQØDZ, VP5AR, 5WN, VQ2AJ, ZE2JE, VS1, 2 and 6CL, TI2FRQ and 3A2AH.

R. Williams (Aschurch) knocked up a pre-selector for his S740 and knocked off Phones CR5PR and 5SP, CR7CF, FF8, FQ8FS, 15US, KH6IB, KS4AU (Swan Island), OA3BG, 4BC, OY2Z, PZ1AL, TG9BG, VP2CZ, 3LF, 4AT, 4AJ, VQ2s and VR1ZZ(??).

A. P. Allchin (Clacton-on-Sea) collared CR5SP for a new one. He heard ZD4BK (0735 = 6/8/53) in QSO with ZM, he thinks, but can't be sure. Anyone help?

G. M. Sifford (Dudley) was on holiday during the worst of the conditions. (He had good weather, too!) VP's 2AL, 4TO, 5AR, and 6FO were heard in 10 minutes, followed by OA4BC (a new one), HI6EC and GM3DCK.

J. Whitington (Worthing) heard some good CW in AP2K, FP8AA, 8AK (W2BBK-Op), MP4BBE (1810), TI2TG, UA9KYB (1340) and Phone came from CR5NC, 5SP (2130), both in Sao Tome, HR1AA and 3A2AY.

John is stuck for Zone 26. Funnily enough, we heard XZ1SS (Mandalay-14200 = 1530 GMT) just before reading his report!

P. D. Lucas (Redhill) pierced the short skip for EA8BG, VS1EU and OQØDZ.

J. P. Corbett (Birmingham) did the same and emerged with Phones VP5AK, VS1ES (1700), MP4KAB, 4X4 and OA4BC, all in 25 minutes!

John is about to try out his painfully-built aerial tuning unit, which should make things fizz satisfactorily.

K. B. Ranger (Strood) pulled in on his O-V-1, Phones AP2N, CR5SP, I5SG, OA4BC, OQØ, TI2AB, VS1FK and CR6AP. CW was from FP8AK, FQ8AR, VQ5CL, VU2RD, 2RX, 2UD and YK1AH.

Keith is due for National Service shortly, so we wish him good luck and hope he finds a

spare moment now and then to keep in touch with the DX.

G. Curtis (South Harrow), who prefers CW, makes some pointed comments on the lengthy tuning up, long, long CQ's and generally clueless behaviour which, with commercial intrusions, are making such a mess of 20, but he finds that sticking to DXperts such as G6ZO, 3BTA and others usually results in some good stuff being heard.

The pick from G.C. are AP2K, 2N, FP8AA, 8AK, I5RM, JA8AA, KH6AMH, KR6GR, 6KS, VS1FE and 3A2AY. ZC3AA, AC3SQ and VK1HM got away. The latter is on the Zone 29, Cocos Isalnds, not to be confused with the Zone 10 Pacific Cocos, where TI9UXX (W6UXX) is planning activity.

R. Nixon (Stockport), with listening confined to dawn and evenings, comes up with AP2QM, CR6AJ, FF8AP, 8GP, HC1FG, KA2US, ZD3RRW, the very strong ZD4BF and ZE2JE.

B. J. C. Brown (Derby) combed " Poor Old 20 " for EL2P (2015), G3AAT/OX, KA2LN (2015) and VE7VC on the key and HP1AP, HI6EC, VP4CO, 4TI, VS1EU and W7DL on Phone.

C. J. Goddard (Warwick), after his spell operating with the T.A., found some nice ones waiting. He got the rare ZC3AA (0900), AP2K, CE4BX, CO5FL, CR6AI, FF8, TI2AP, VP2KO (2230), VP4EE, all CW, with DU1AL, I5GO, JAØAA (14105-1700. Any gen, anyone ?), MP4ABW (Quarter), VP5DJ, VP7NB, VQ2DT and VK2GO. DM2ACM, also heard, is in East Germany. These on Phone.

P. M. Crawford (Darlington), sticking to Phone this time, grabbed FN8AD, FO8AR, KA2IM, 5VW, KC6BN, KR6KS, KZ5WN, M1B, OA, VE8ML (5 and 9 at 0620), VQ5CB and ST1AYR, who continues very active.

Martin has a QSL from ZM6AA, giving some useful info., which we quote. " I am not a DX'er and work mainly fixed skeds, with an occasional CQ. Reception of G's is *out* here and even the BBC does not put in a reliable signal." So there you have it, chaps.

S. J. Melvin (Nuneaton) caught a nice one on CW in ZS8D (0630). Others were CE4BX, FQ8AR, KA2HQ, ET2CG and CO7AH.

P. Hunt (Ellistown) has changed his 1155 for an 11-valve Canadian 52 receiver, which pulled in ZK2AA, VK9MB and 9NA (three nice ones for a start), VK7AB (0500), KA2OM, VS7EA and ZC6UNJ.

J. H. Lloyd (Enfield) is welcomed to these pages. He is phone only and has 37Z-183C heard on an 1155 and 14 Mcs dipole.

Recent good ones are CR5SP (14190-2100), KX6BF, FB8BJ, KH6OR, VP2KM, HI6TC, KB6AQ, FQ8AE, VS6CL, MP4ABW, KA8SC, VP1WM *and* HL4SY (1300, rather doubtful, we feel, this one).

P. Dixon (Penrith), also welcomed, is sorry he can't send in a list mentioning rare call-signs and complaining about conditions ! In less than a year, he is up to 27Z-84C, using an O-V-1. Recent new ones are I5US, ET2 (Eritera), LU7AO, MP4K and MP4B, plus OQØDZ (Ruanda Urundi), VP4, VP7, TI2, VS1EV and 5A4TC (yes, they've started on 5A4, now—still Tripoli).

Regular Reader (Bristol) sends his first (and, he threatens, his last) log to *any* magazine. (Well, tut, tut, we hope not !) His job, with British Railways, means he has little time for listening, but with an S640 and Windom, he hears Phone from such as CS3AC, FC2EA (interesting—presumably Corsica), HI6EC, OA4BC, OQØDZ, VP5AK, 9AK, VQ2JE, VS2UW, VU2MC, VS1 and 4X4AS/MM (Gulf of Corinth).

P. J. Price (Smethwick), too, reports for the first time. He uses a mains O-V-0 and inverted " L " aerial. Using Phone, he bagged CM9AA, KL7ADR, TI2OA, VP5AR. On CW, he caught EA6AF, FQ8AR, KZ5EM and VP4LZ.

G. C. Allen (Thornton Heath) was right on the job when CEØAA opened up at 2340 on August 7th, at which time the queue was heard going into action on a dying band. After a little digging around in the mess, the quarry was discovered in splendid isolation, 10 kcs inside the band ! The next day, his Phone came through weakly on 14100 kcs, while the following day, George copied him on 7003 kcs, where he worked two G's—G4CP being his first G QSO—plus several W6, 5, Ø and ZL. He will be back home again when you read this, we expect, but we hope lots of you did manage to hear him.

N. C. Smith (Petts Wood) is very happy with his VRL receiver. He has perked it up and is satisfied it can be improved further, but already it compares favourably, on a long wire, with a local amateur's set-up which features a 3E1 beam.

Some items of " gen " from Norman concern CR5SP, on 14190 daily at 2000, in Phone QSO with CT1CL and 3A2AH, who uses 14330 for QSO's with G6LX. AC4NC was called by W's on 14120 and G3HLS worked an AC4 this year. N.C.S. suggests keeping an eye on Doha, an independant Sheikdom in the Persian Gulf area, which is growing fast and may soon issue its own stamps, so look out for another new country.

Latest CW heard was from CP3CB (1605), EQ1AC, ZK1AB, KG6FAA, CR7IZ and

FU8AA (0700). Phone DX included the peculiar MP4K, KH6AWM, OA4BC (1818), KF3AA, VP2KM and KX6BC. 9A2A, also on Phone, is presumably in San Marino.

More "gen" mentions activity from VK9RM, JAØIJ (now on Volcano Island), FK8AV (CW-0700), HL2FY (14165-Phone) and VU5AB (now on again from The Andamans). YS1O is active usually during contests.

An HC8 is expected from Galapagos and a Clipperton Island expedition is reported pending. All of which should keep everyone happily busy !

And, late flash, VQ7UU was heard on CW.

Top Band News

G3IYW sends good news for those among you who need the county of Brecknock. On September 12th, and 13th, a station will be on the air—continuously, it is hoped—on both CW and Phone, using both Top Band and 80 Metres. The call-sign will be G3GMN/P (are we wrong in thinking it should be GW3GMN/P ?—no matter) and the operators will include G's 3GMN, 3EUK and 3IYW.

Other Bands

N. C. Smith provides a good send-off to the rather lean pickings on bands other then 20. Eighty CW yielded ZL2AFA and 9S4BN, 40 CW did better with FP8's AA and AK, W5NWX and six ZL's, while 15 was good for SU1GG, LU8BQ on CW and a good one, LU5XE (southern Patagonia), YI3WH and 3A2AY on Phone.

Norman is impressed with the strength of W1, 2 and VE on 80, and suggests the band should be good later on, with which we quite agree.

P. D. Lucas succeeded in digging out CR4AI, ZD2S, LU3BD, OQ5BQ and YI3CWE from the morass of 15 Phone.

On 80, **G. M. Sifford** was rightly pleased to hear 5 and 9 signals from both W2ZQ and W3KIF/Portable mobile, for his first signals heard from outside Europe. The time was 0345 (Ugh !) and we imagine the mobile station (surely in a car), will be equally shaken to know he was putting such a wallop into Europe.

Ron Goodman, too, was combing 3.5 Phone and pulled in W1, 3 and VE1's around the same time. On 15, the O-V-0 accounted for KZ5DE, VQ2DT and FKS8AA.

J. Whitington, using 40, nobbled YV5EQ (0445), 5A1 and ZL2BJ (0440) on CW and CE4BD and LU7BF on Phone.

C. J. Goddard unearthed SP6XA (CW) and EA8AX (Phone) from 15, but he dosen't spend much time on the band.

B. J. C. Brown actually heard LU3DFJ on 10 Phone ! Heartened by this, he nipped onto 15 and snagged a new one in a 9S4, plus CE3CZ (2200), LU3DD and OQ5.

Other DX News

As reported by **G. C. Allen**, CEØAA started up on August 7th. Some days earlier, on August 4th, and 5th, a certain crack-brained moron was using the CEØ call-sign on 20 CW. He was convincingly weak, but came through at the peculiar time of 1800 GMT. We'd place him somewhere in the States and we hope the gang over there tracked him down and applied some RF where it would do him the most good ! We worked this character —fortunately we got the genuine article too !

We managed to work VQ7UU and, later on, VQ9UU. This was on August 11th, and the location was the Amirante Islands, a small group S.E. of The Seychelles, and a dependency thereof. In other words, VQ9 Amirante and VQ9 Seychelles count as one for DXCC purposes. We mention this particularly because '9UU flew to Seychelles and operated from there also for a day or two. His next stop is scheduled for 15, then on to pastures new, as reported earlier.

We recently came across KX4DH, using CW (579) in the Phone band and working European Phones. He gave his QTH as Iowa Island, near The Marshalls (KX6) and although the time was right—1300, onwards—we don't care very much for the set-up.

The other day, we overheard HI6EC giving some very good advice on the subject of QSL's from SWL's. Lots of SWL's, when sending a DX station a report, enclosed an International Reply Coupon for return postage. Normally, of course, this is an excellent thing to do, but there is a big snag. Post offices in countries outside the Universal Postal Union will not exchange IRC's and many Central and South American states fall into this category. The Dominican Republic is one example. In such cases, or when in doubt, the answer is to obtain the current postage stamps of the country in question—a stamp dealer, or even the consulate of the country concerned will be able to oblige—and send a SAE with the report.

John H. Lloyd would like to see a table of post-war zones and countries wkd/hrd and verified. We think it a good idea. What do *you* think ?

DX QTH's

Virgin Is. (KV4) QSL Bureau.	R. Spenceley, Box 403, St. Thomas, Virgin Is.
VQ7UU, VQ9UU, etc.	Via the RSGB.
CEØAA.	Radio Club de Chile, Box 761, Santiago, Chile.
ZM6AA.	J. L. Anderson, P.O. Box 23, Apia, Samoa.

And that tidies things up for this month. We hope conditions prove kinder for our next. Your reports please to reach Roker House, South Cliff, Roker, Sunderland, by September 8th, and by October 8th, for the following issue. BCNU, 73 and good hunting.

CLUB NEWS

Club Secretaries are invited to submit notes for this feature by 15th September, for inclusion in next month's issue.

Grafton Radio Society. Hon. Sec.: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.

The Club is re-opening after the summer break, on Friday, September 4th, at Grafton School at 7.30 p.m., visitors and new members being especially welcome. Club nights are Fridays only during September, the A.G.M. being on September 18th, but the usual Mondays and Fridays will commence on September 28th. A full programme of talks, demonstrations, etc., by leading "Hams" and the trade is being arranged, and with the Club transmitter on most amateur bands, Grafton look forward to a most successful season.

Warrington and District Radio Society, G3CKR. Hon. Sec.: G. S. Leigh, G2FCV, 49 School Road, Orford, Warrington.

Meetings continue to be held on the 1st and 3rd Tuesdays of each month at the King's Head Hotel, Winwick Street. 7.30 p.m. lectures by W7OFU, G3FGI, and a Junk Sale have been features of recent meetings.

Future activities include lectures and demonstrations on VHF, Region 1 Field Day at Lower Whitley and the GR Trophy Top Band contest on September 26th.

W7OFU has now left us on his return to W-land.

An open invitation to our meetings is extended to all interested.

Tops Club. Hon. Sec.: J. P. Evans, GW8WJ, 2 Ffordd, Ty Newydd, Meliden, Flintshire.

This will serve as a last minute reminder of our Topsfest at Chester on September 12th, all welcome . . . be they member or non-member, ham or SWL. Ask for the Y.M.C.A. Chester upon arrival in that City.

Our Flight Section contest was well supported by both member and non-member on July 26th. G3ABG logged 55 points and G8KP 52 points. G8PG had the best score outside the Flight Section.

VERON Code Proficiency Certificates are held by at least six of our members. The Dutch Society is pleased to see that so many hams/SWLs are trying for their award. New readers of these columns should refer to the July issue of *The Radio Amateur* for full details.

Latest recruits are G2QB, G3DWW, GM3EFS, G3IKO, G3IOB, GD3IYS, G4PX, G4TM, G5JM. G5JU, DL4PU and Wilf Roberts, P. Nicholls become associate members T111/T112, respectively.

Tops now have 229 members in 17 countries—amongst whom are 61 ex-R.A.F., 53 ex-M.N./R.N. and 43 ex-Army types. These include the representatives of equivalent services in foreign countries.

Clacton Radio Club, G3CRC. Hon. Sec.: R. J. Appleby, G3INU, 95 Oxford Road, Clacton.

At the Annual Meeting of the Clacton Radio Club, on Friday, July 17th, 1953, it was decided unanimously that the Tx licence should be retained, and that meetings should be held on alternate Friday evenings, beginning July 31st. The meeting place being the Lasefield Guest House, Beach Road, Clacton.

The vice-Chairman, Mr. W. A. Dobson, B.Sc., spoke of the work done during the past year, and thanked Mr. R. F. E. Bliss, the past Secretary for valuable work done in forming the Club.

It was decided that subscriptions should be paid quarterly, and not as in the past, at each meeting.

Two new members were welcomed. They were Mr. L. White and Mr. F. Ellis, both of Clacton.

Mr. Brian Dape a visitor on holiday from Derby paid us a visit, and we hope the R1155 is bringing in the DX. Good luck Brian with the RAE.

Officers were elected as follows :—Chairman, Mr. W. A. Dobson; Secretary, Mr. R. J. Appleby (G3INU) Treasurer, Mr. L. E. Healey; Committee, Messrs. W. Mason (G3HSM), J. Pitcher and J. Huggett.

New members would be made very welcome, and the only qualification needed is an interest in radio. Hi !

Torbay Amateur Radio Society. Hon. Sec.: L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot.

Final arrangements for the SW Hamfest of No. 9 District of the RSGB—in which all members are co-operating—are now completed.

Hamfest will be held at the "Oswalds Hotel," Babbacombe, Torquay, on Sunday, October 11th, 1953, assembling at 12 noon. The full programme will be announced later, in the *RSGB Bulletin.*

Tickets—price 12s. 6d., to include lunch and tea—can be obtained, and are now on sale, from Donald Cawley, G2GM, 1 Littlegate Road, Paignton, Devon—the Hon. Treasurer of the Society.

Meetings held on 3rd Saturday each month, at the Y.M.C.A., Torquay, at 7.30 p.m.—next meeting on September 19th, 1953.

The Slade Radio Society. Hon. Sec.: C. N. Stuart, 110 Woolmore Road, Erdington, Birmingham 23.

During September and October, the following events will take place. On September 18th, a lecture, "The Electron Microscope" by Mr. A. G. Barton of Metropolitan-Vickers Electrical Co., Ltd. On October 8th, 9th and 10th, the Society will participate in an Exhibition organised by the Sutton Coldfield and North Birmingham Model Engineering Society. A transmitting station will be in operation and there will be a display of radio and electronic equipment. Both these events are at the Church House, Erdington, Birmingham. The lecture commencing at 7.45 p.m. Visitors will be very welcome.

The East Surrey Radio Club. Hon. Sec.: L. G. Knights, Radiohme, 6 Madeira Walk, Reigate.

There was no monthly meeting of the above Club during the month of August, the next meeting being on September 24th, 1953, when Mr. W. Barnard, will be describing some of his recent experiences in the USA with television receivers.

The Club room will be open as usual for members and visitors on Monday, Thursday and Saturday evenings, for practical work, etc.

RAE AND MORSE CLASSES

These are to be held at the Ilford Literary Institute, High School for Girls, Cranbrook Road, Ilford, Essex. Adjacent to Grants Hill Underground Station (Central Line).

Two courses are available—RAE Course and Morse Course.

RAE Course—Wednesday evenings, 7.15 to 9.15 p.m. Cost: 10s.

Morse Course—Monday evenings, 7.15 to 9.15 p.m. Cost: 10s.

Cost of both courses combined: 15s.

Applicants outside Essex County should obtain written permission to attend from their local education authority.

These courses have now been running for five years during which time over 100 amateurs have been successfully "put on the air."

RADIO AMATEURS' EXAMINATION

The Grafton Radio Society has made arrangements with the local L.C.C. Men's Evening Institute for an official course of instruction for the RADIO AMATEURS' EXAMINATION to be held during the coming winter months.

Classes, including Morse instruction, will be held at the Grafton L.C.C. School, Edburne Road, Holloway, London, N.7 (one minute from the "Nag's Head"), on Monday evenings commencing September 28th, and application in the first instance should be made to the Grafton Radio Society Secretary:—A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

We should be most grateful if you will kindly give the above full publicity in your next issue, as it is the first time that such classes have been held in North London.

RADIO PAKISTAN

by

ROY PATRICK

Radio Pakistan, which holds a monopoly of broadcasting in Pakistan, is a government-controlled organisation under the Information and Broadcasting Division of the Ministry of the Interior.

On August 14th, 1949, the first high-power transmitter of Pakistan started operating at Karachi, and with its operation began the External Services with programmes in Arabic, Iranian, Afghan, Burmese and from March 20th, 1952, a regular service in GUJRATI, directed to listeners in South Africa. Programmes on experimental basis are also being broadcast for listeners in Great Britain and Ireland, Turkey, Indonesia and South Asia since January 18th, 1952.

At the eve of partition of Indo-Pakistan subcontinent, Radio Pakistan only consisted of three isolated medium wave stations, with no inter-linking arrangements, not enough technical operators to man all the shifts, old and worn out equipment. Under these great difficulties, Radio Pakistan managed to maintain a regular service. During the first five years of its existence, Radio Pakistan has made considerable technical progress, and to-day they have a network of five broadcasting stations operating nine transmitters, four of them short waves. The high-power short wave transmitters at Karachi provide a link for all regional stations. This short wave station is located at Landhi, about 15 miles from Karachi. The aerial system is one of the three largest aerial systems in the world and first of its kind to be installed in Asia as far as automatic operation is concerned. The linking of East and West Pakistan has been made possible with a short wave transmitter at Dacca. Then there has been the installation of teleprinter links between the studios of Peshawar, Rawalpindi, Lahore and Karachi.

To-day, after five years, Radio Pakistan has emerged as a full-fledged National Broadcasting system, which has played a big part in facing the desperate need of the moral and mental rehabilitation of millions of displaced persons. The scope of the " nation building " programmes, which still continue to be broadcast, has ranged from the great Islamic ideals of brotherhood, social justice and democracy to the realisation of new values in the National set up. More news and reportage has been the watchword of Radio Pakistan, to " bring more and more people to the microphone to give a first-hand report to the Nation of the progress made in various spheres. A number of the regional stations are almost completely independent, producing their programme in the main languages of their respective zones, apart from the 20 news bulletins and any National programme and official government broadcast, which are relayed by all stations.

The QSL card is coloured in many different shades and is certainly well worth having on the walls of your shack. The card is issued to all listeners who sent along a period reception report with sufficient programme details. QTH is Radio Pakistan, 71 Garden Road, Karachi.

ENGLISH TRANSMISSIONS

Relayed by all Stations in Pakistan

0700	GMT	17710 kcs.	
0830	,,	17710 ,,	
1230	,,	15270 ,,	
1515	,,	11845 ,,	
1715	,,	7010 ,,	(Dict. News).

TRANSMISSIONS beamed to BRITISH ISLES

2015 to 2100. 7010, 6235 kcs. Summer schedule may use 11940, 9484 kcs.

Future Plans

It comprises a number of projects, of which some are already at various stages of completion. The important ones are the setting up of two 10 kW, SW Transmitters at Karachi, another 10 kW SW Transmitter at Peshawar, 10 kW MW and SW Transmitter at Rawalpindi and three satellite stations in East Pakistan.

B.C. Bands Review. (*Contd. from p. 346*)

with S3-5 signals around 2300-2400 with very enjoyable musical programmes. No Latin-American rythms were included, and operetta selections by Lehar were featured for 20 minutes. Identification was announced frequently as " Radio Illimani, La voz de Bolivia." (Scribe.)

QSL SECTION

The following readers have received QSLs from the stations listed, during the past two months.

Arthur T. Cushen (Invercargill, New Zealand), Ian Hardwick (Thames Line, New Zealand), Manfred Lepple (Stuttgart, Germany), Edward T. Classe (Vienna, Austria), Patrick Cody (Roscrea, Ireland), Stanley Coppel, (Belfast, Northern Ireland), Carl Shapiro (Belfast), Sidney Pearce (Berkhamsted), Roy Patrick (Oldham, Lancs.) and William P. Griffith (Ashtead, Surrey).

Radio Yugoslavia, VOA Munich Relay, BFS Trieste, VOA Relay " Courier," Radio Free Europe, Lisbon, MSF Rugby, ORU Brussels, NWDR Hamburg, RIAS Berlin, OZF7 Denmark, Radio Norway, Monte Carlo, BDN Slazburg, Paris-Inter, HEU3, HEI3, Pan-American Radio Tangier, FBS Tripoli, VQ7LO Nairobi, Salisbury, ZQP Lusaka, Cairo, Mogadishu, CR4AA Praia, FIQA Tananarive, Brazzaville, Omdurman, CR5SC Sao Tomé, Kuwait, ZJM7, ZJM8, TAS, TAU, TAV, Tashkent, VOA Relay Colombo, Radio Ceylon, BFEBS, Radio Peking, Lagos, Djakarta, JKI, JKL, JKI4, JOA4, JOB3, VOA Relay Manila, DZ17 Manila, HSK5 Bangkok, VLG7, VLM4, VLX4, VLR9, VLQ9, Suva, KCBR, KGEI, KWID, WLWO, WDSI, WRCA, HI2T, Trujillo, TGJA, COCO, " Radio Excelsior " San José, YVMQ, YVMK, YVXJ, YVME, ZPA5 Encarnacion, TIHBG, HCJB, CE1173, CE1190, CE1174, ZFY Georgetown, SIRA Buenos Aires, ZYK2 Recife, ZYP23 Petropolis and YSAXA San Salvador.

CONCLUSION

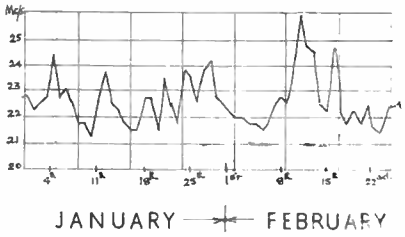
Material for this column is always appreciated; information from QSLs received from Central and South American stations is particularly welcome, and we always like to hear from listeners overseas—remember that your local stations are DX to us ! Short-wave broadcast news should be received before the 4th September for the October issue, and the 4th October for the November issue.

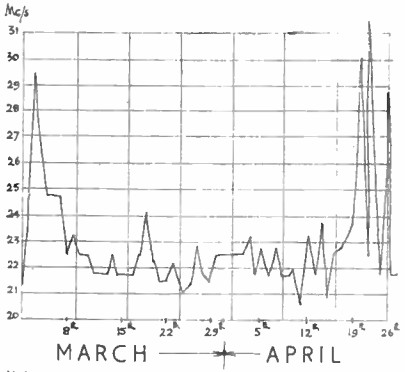
The Editor and your Scribe thank all readers and DX editors for their letters and contributions, and all is duly acknowledged. Republication of any items should be credited to *The Radio Amateur*. The address for everything is J. Fairs, 2a Durham Road, Redcar, Yorkshire.

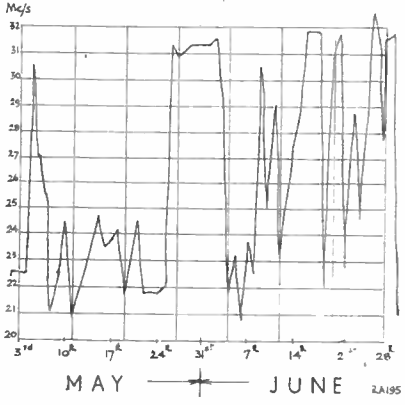
73 and happy hunting around the dials.

IONOSPHERIC DATA

In our February number we outlined a scheme for ionospheric mounting by amateurs. We reproduce below the results of our own records for the first six months of this year.







XYL OPERATOR. (*Contd. from p. 337*)

the air, but had something wrong with my IX, they helped me to solve the problem. Others did their best to help me to get in contact with Dx stations; and all of you helped me to spend some very pleasant moments and to practice and perfect my foreign languages.

Those who call the radio amateurs fools (and you know that there are a lot of people who think we are crazy) should follow the activities of an amateur closely for let's say a month, and I am quite sure that before long they would become enthusiasts. They don't know that besides learning other languages, we also keep up our geography which was learnt in school, but almost forgotten soon afterwards. We get acquainted with all sorts of problems from the technical to the most simple facts of everyday life.

On my numerous QSOs I have had a little of everything and I love to laugh as much as I love to discuss serious problems. I remember having one evening a QSO with a VPG station for almost two hours. During that time we exchanged opinions about our respective ways of life. The operator told me a lot of interesting things about the primitive inhabitants and the origin of the name of the Island. What his work and house were like, and also the kind of flowers he grew in his garden. On my side I told him why port wine is found only in the north of Portugal and how it is cultivated and later on made and transported to Oporto to store and export.

Another long and interesting contact was the one I had with an English doctor, who is also a radio amateur. With him I discussed medicine for a long time, especially that connected with children's diseases. I learnt much during this communication. Although I am a nurse and married to a doctor and could understand a certain amount easily, it is always pleasant to improve one's knowledge, no matter what the subject.

During another contact, I was asked to give my opinion on classic music and which were the composers I liked best. From there we went on to dance music and what dances I preferred, and as this is one of my favourite pastimes, I said what dances I liked best and how I thought they should be danced. He did encourage me to go on talking about this subject but at the end it turned out that I was speaking to someone who hated dancing and only tolerated dance music when he was comfortably sitting in a sofa near the fire and reading his evening paper. He explained afterwards that he had found so many adepts of dancing that he often wondered why he didn't like it and wanted to see if he could become interested. The result I don't know, but I heartily think that if he disliked dancing it was not through my words that he became an adept.

Speaking of amusing QSO's, I was once asked by a young man who was engaged, soon to be married, if for his own peace of mind, he should instruct his future wife in amateur radio or not. He said that I, better than anyone else, could be of some help to him in this matter, because I was an amateur and married. He was afraid of his fiancee getting interested in this hobby, because later on when she would call CQ she would get many more answers than he and as she would speak mainly with men he might feel jealous. I did laugh at him a bit, but I told him afterwards that it was much better for them if they were both interested in amateur radio, because even if he sometimes felt jealous because she got more answers than he, it was much better than quarreling because he wanted to stay at home to be on the air, while she wanted to go out either to the cinema or just to visit some friends.

The most amusing contact I have had until to-day was one I had with a DL4. He had the shack full of friends, all of them Americans in the services over in Germany. We were speaking about technical things, when I heard the voice of one of his friends saying " Look here chap, what has happened to you that while speaking with a girl, you talk of technical problems instead of other more interesting and more common subjects ? Why don't you ask what she looks like ? " All this was repeated to me by the owner of the station. When I took back the microphone and after answering all the other questions and making some amusing comments about his friend's curiosity, I at last broached the last subject. I gave him a detailed description of myself, not entirely true of course, and I finished by saying (and this is true) that I was happily married and the mother of three loving children.

After that, I passed him the mike and all I heard was the sound of a gong " Bung . . . " and then the operator saying " My friend has just fainted after your last words." I couldn't resist laughing and the QSO finished in the middle of jokes and laughter.

I can't go on relating my many contacts, but before I finish I would still like to speak about the many amateurs who were led by me to think that CT1JM's second operator " Maria " and the CT1YA " Maria " were two different persons. I used to laugh a good deal and to pull the leg of the OM with whom I was speaking in those first months when I got my call sign and only very few amateurs knew about it.

Before finishing those QSO's, I used to tell them the truth and then we laughed together about the mistake I had made them believe for a few minutes. Once at the end of March an amateur told me that I should have waited until April 1st, " All Fools' Day " and then the joke would be still better.

(*Concluded overpage*)

XLY OPERATOR. (*Contd. from p. 357*)

Like this I spent some agreeable moments and even sometimes when I felt depressed, my spirits brightened after being in contact with another station.

Nowadays, I can't understand how at the beginning I could have been so much against Amateur Radio.

All of us know that it brings us a lot of knowledge and pleasure and even when we travel, we never feel alone, we have always friends everywhere, who receive us in the kindest way.

V.F.O. DISCUSSION. (*Contd. from p. 334*)

cent. of the total range of tuning was used $\left(\frac{15}{200} \cdot 100 = 7\,\%\right)$, and hence the dial could be calibrated with ease.

Output

By virtue of the fact that a 25-watt valve is used, it is possible to obtain, under efficient "class C" oscillator conditions, a useful output at 14 Mcs of the order of 2 watts, and whilst this represents only about one-twelfth of the total possible dissipation, the temperature change between "receive" and "send" switching operations is negligible.

The electron-coupled oscillator followed normal practise, but due attention was paid to the cathode tap, and the anode/screen voltage relationship. The grid cathode resistor (with an 807) was 50K Ω, providing sufficient bias under oscillating conditions for class "C" working with high harmonic output; the second harmonic appearing at the anode (14 Mcs) provided about 1:5 watts of drive for a buffer/doubler or PA stage using similar valves.

With this arrangement it was found preferable to tune the doubler or PA stage grid/cathode input, and a low impedance coupling from the VFO was used as shown in Fig. 1.

General

The physical construction of the single-valve VFO may take any convenient form; the writer used a metal cabinet of the dimension mentioned earlier, and fitted a steel screen at the centre. The frequency determining circuits were located entirely on one side of the screen, the 807 being mounted horizontally with its base through this latter side; the anode top cap appeared quite separately at the other side, as did the anode coil (14 Mcs) and its associated capacitor, decoupling, etc.

It is not proposed to recapitulate on the ECO; it is so popular that the importance of cathode tap and screen voltage adjustment will be well known. It will be of interest to note that the unit built by the writer, having been calibrated against a crystal sub-standard, retained its calibration accuracy of ± 3 kcs in 14 Mcs (0.02 per cent.) for a period of many weeks. Numerous "break in" contacts were made on 28 Mcs, and reports from all "W" areas suggest that not at any time did the signal become difficult to read due to drift or instability.

There is perhaps nothing "new" in this article, but the writer felt that the virtues of one valve for a stable VFO of good output should be expounded, despite the fact that the unit "lived" in 1950, and unfortunately no longer exists. This article did not set out to describe a piece of apparatus, but to pass on some hints which it is hoped will set a new course for thought in the minds of the amateur transmitter, particularly as the tendency nowadays is toward the simple "table top" or portable equipment, rather than ambitious racks of equipment.

S.W.B.C. LIST AMMENDMENTS

Kcs.

6040—Delete: WLWO-1 Msaon, Ohio, USA.
„ — „ KCBR-3 Delano, Calif., USA.
„ —Insert: Salonika-1, Greece (VOA Relay).
(As per last amendment list.)

6040—Insert: (E) ZM2AP Apia, Western Samoa. (After VUD.)
6043—(49.64 m) Insert: Paris, France.
6050—Insert: Foochow, China. (After Tbilisi.)
*6057—(49.53 m) Insert: Komsomolsk, USSR. (Siberia.)
6072—(49.40 m) „ HC1AC Quito, Ecuador.
„ — „ „ Bukhara, Uzbek SSR.
6080—Insert: DZ17 Manila, Philippines. (After JK13.)
6085— „ (after ORU): Prague, Czechoslovakia.
„ — „ (after Cairo): "Radio Free Europe."
6090— „ (after HOO): OAX4G Lima, Peru.
6095—OLR Prague: Complete call to "OLR2H."
„ —Insert (after OLR2H): ZRH Johannesburg, South Africa.
6100—Insert (after YNV): (E) Suva, Fiji Islands.
„ —Belize: Add call sign "ZIK2."
6102—(49.16 m) Insert: (V) Djeddah, Saudi-Arabia.
6110—Insert (after DZ14): VUD3 New Delhi, India.
6115— „ (after HC2FB): Komsomolsk, USSR. (Siberia.)
6120—WDSI-2 Brentwood: change call sign to "WDSI-1."
6125—Insert: Moscow, USSR. (After Manila-3).
6128— „ (after OAX7A): TGQA Quezaltenango, Guatemala.
6130—LKJ2 Tromso: change call sign to "LKJ."
6135—Baghdad, Iraq: Add call sign: "HNM."
„ —HJEV Cali, Colombia: change call sign to "HJED."
6140—Delete: Tangier-2, Tangier. (VOA Relay.)
* 6060—*Delete*: *WRUL-1 Scituate, Mass., USA.*

SHORT WAVE BROADCAST STATION LIST

(T) Denotes Tentative Frequency or Station Under Construction.
(V) Denotes Frequency liable to Variation.
(E) Denotes Experimental Channel.
(I) Denotes Inactive at the time of publication.

Kcs		*M*	*Call*	*Location*
			COCD	Havana, Cuba.
			JKQ21	Kawachi, Japan.
			VLT6	Port Moresby, New Guinea.
			XEQH	Mexico City, Mexico.
	(I)		ZL11	Wellington, New Zealand.
	(I)		VPD2	Suva, Fiji Islands.
6131		48.93	HI1G	Ciudad Trujillo, Dominican Republic.
6134		48.91	*FO8AA	Papeete, Tahiti.
6135		48.90		Moscow, U.S.S.R.
			PRC21	Porto Alegre, Brazil.
				Singapore, Malaya.
				Baghdad, Iraq.
			HJEV	Cali, Colombia.
			CP30	Santa Cruz, Bolivia.
6138		48.88	APL	Lahore, Pakistan.
6140		48.86		Munich-5, Germany (U.S. Zone). (VOA Relay.)
				Tangier-2, Tangier. (VOA Relay.)
				Belgrade, Yugoslavia.
				Warsaw, Poland.
			OTC	Leopoldville, Belgian Congo.
			DYH2	Cebu, Phillipines.
			HOQQ	Panama City, Panama.
6141		48.85	TGJB	Guatemala City, Guatemala.
6145		48.82		Paris, France.
				Algiers, Algeria.
			HJDE	Medellin, Colombia.
			LRR	Rosario, Argentina.
6147		48.80	PRL9	Rio de Janeiro, Brazil.
6150		48.78	GRW	Daventry, England.
				Moscow, USSR.
				Khabarovsk, USSR.
				" Radio Free Europe."
			VUB2	Bombay, India.
			VLR6	Melbourne, Australia.
			CE615	Valparaiso, Chile.
			YSP	San Salvador, El Salvador.
			CKRO	Winnipeg, Manitoba, Canada.
			CP12	La Paz, Bolivia.
			HI1R	San Cristobal, Dominican Republic.
			TGAZ	Guatemala City, Guatemala.
			TIRH	San Jose, Costa Rica.
6154		48.75	CSB52	Lisbon, Portugal.
				Chungking, China.
6155		48.74	WLWO-8	Bethany, Ohio, USA.
				Moscow, USSR.
				Vienna, Austria. (USSR Zone.)
			EQB	Teheran, Iran.
			XEEP	Mexico City, Mexico.
			OBX4G	Lima, Peru.
6157		48.72	CXA13	Montevideo, Uruguay.
6160		48.70	OZF	Herstedvester, Denmark.
				Moscow, USSR.
				Munich, Germany. (US. Zone.)
				Algiers, Algeria.
	(I)		CHAC	Sackville, Canada.
			CBRX	Vancouver, B.C., Canada.
	(V)		HJKJ	Bogota, Colombia.
			OAX1A	Chiclayo, Peru.
6165		48.66	GWK	Daventry, England.
			HER3	Schwarzenburgh, Switzerland.
				Moscow, USSR.
				Damascus, Syria.
			TILS	San Jose, Costa Rica.
				Hanoi, Indo China. (Vietnam.)
6167		48.64	4VCM	Port-au-Prince, Haiti.
6170		48.62	GSZ	Daventry, England.
				Moscow, USSR.
				Munich-4, Germany (US Zone), (VOA Relay).
				Tangier-5, Tangier. (VOA Relay.)
			WDSI-2	Brentwood, Brentwood, NY, USA.
				" Radio Free Europe."
	(V)		ZJM5	Limassol, Cyprus.
			DUH2	Manila, Philippines.
			YVKO	Caracas, Venezuela.
			CXA21	Montevideo, Uruguay.
			YDG	Surakarta, Java.
			OAX4B	Cerro de Pasco, Peru.
			YSHQ	San Miguel, El Salvador.
6172		48.60	FIQA	Tananarive, Madagascar.
6175		48.58	OLR2D	Prague, Czechoslovakia.
				Moscow, USSR.
				Djeddah, Saudi-Arabia.
				Singapore, Malaya.
			JKG21	Kawachi, Japan.
			HSE2	Bangkok, Thailand.
				" Radio Liberation " (Clandestine).
			HOB	Panama City, Panama.
			XEXA	Mexico City, Mexico.
6177		48.56		Athens, Greece.
6180		48.54	GRO	Daventry, England.
				Ashkhabad, Turkmen SSR.
			LRM	Mendoza, Argentina.
			TIPGH4	San Jose, Costa Rica.
			YSMA	Santa Ana, El Salvador.
			TGXX	Guatemala City, Guatemala.
				Saigon, Indo China. (Vietnam.)
6182	(V)	48.52	TGWB	Guatemala City, Guatemala.
6185		48.50		Munich-2, Germany (US Zone), (VOA Relay.)
			KRCA-3	Dixon, Calif., USA.
				Moscow, USSR.
			LLI	Tromso, Norway.
			XECC	Puebla, Mexico.
			YNVP	Managua, Nicaragua.
			CP9	La Paz, Bolivia.
			HC1IM	Ibarra, Ecuador.
6188		48.48	YSUA	San Salvador, El Salvador.
6190		48.47		Frankfurt, Germany (US Zone).
			VUD2	New Delhi, India.
			VUD7	New Delhi, India.
	(T)		HVJ4	Vatican City.
				Moscow, USSR.
			CE619	Santiago, Chile.
			HI9T	Puerta Plata, Dominican Republic.
			CP37	Oruro, Bolivia.
			JKM21	Kawachi, Japan.
6195		48.43	GRN	Daventry, England.
				Moscow, USSR.
			PRD21	Niteroi, Brazil.
				Damascus, Syria.
6198		48.40		Cayenne, French Guiana.
6200		48.39		Paris, France.
	(V)		HJCT	Bogota, Colombia.
			TGWB	Guatemala City, Guatemala.
	(V)		TIMC	Liberia, Costa Rica.
		(T)		Rio de Janeiro, Brazil.
			4VA	Cap Haitien, Haiti.
			OAX4P	Huancayo, Peru.
				Pyongyang, North Korea.
6203		48.37		Batumi, Georgian, SSR.
6207		48.33		Damascus, Syria.
6210		48.31		Bucharest, Roumania.
				Moscow, USSR.
			ZRB	Odenata (Pretoria), South Africa.
6215		48.26		" Free Bulgaria " (Calandestine).
	(I)		HI9T	Puerto Plata, Dominican Republic.

TO BE CONTINUED

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PRIVATE

AMATEURS SURPLUS EQUIPMENT, all in new condition. Selling because of moving QTH. 50 microamp M.I.P. 4½" scale (sq.) meter £3. 500 microamp Turner 2" sq. meter £1 10s. Z77 valves (small quantity) all brand new and unused 4s. 6d. each. Few only EC91 (6J4) brand new, at 6s. 6d. each. E.M.I. Absorbtion Wavemeter 1·6-30 mcs £4. E.M.I. G.D.O. 1·6-30 mcs £4. Various other items, including meters, valves, etc. No lists available, state your requirements. These offers hold until third week in September only. Box No. C 136.

FOR SALE. VCR97, new, picture tested. Magnifier, mask and base. 14 at J50s, 0.1-0.02 high voltage capacitors. Offers—HAR 5096. P. Connell, 37 Toorack Road, Wealdstone, Middx.

FOR SALE. Rx R208, fine trim £10. Indicator unit in good order, 25s. Lots of really friendly junk for disposal, callers welcomed. G2AWJ, Coldwaltham Vicarage, Pulborough, Sussex.

MRC1. Miniature communications superhet, 19-2000 metres, AC/DC, Power pack, coils, 1S4 output, perfect £7 10s. WS18—Tx/Rx—with accessories,, Mk III, perfect £4. Brigham, Forneth, Cati sfield Fareham, Hants.

TV BARGIN. Two R1355 Vision/Sound receivers. RF25 and RF26 units, converted to channels 2 and 4. VCR97 tube, power pack and time bases. All in perfect working order, offered, together with partly-completed cahinet, for £17. Free delivery, under 50 miles, by car. Maloney, 33 Balfour Road, Preston.

VIEWMASTER COMPONENTS. Holme Moss £10, cost £15. AVO valve tester £9. All-wave signal generator £6 10s. Williams, 7 Chapel Street, Portmadoc, Caerns.

R116A. Battery communications Rx, double superhet, seven wavebands covering 142 kcs to 20 mcs, complete with transit case, £8. Moore, 33 Jackson Road, Clacton-on-Sea, Essex.

PYE A39J/H. 11 waveband, 9 watts push-pull output, £30, spot on. Sussex. Box No. C 135.

WANTED. Denco Coil Turret with RF stage, IF 1.6 Mcs. State price. Taylor, 37 Lulworth Avenue, Blackpool.

WANTED. Unused Eddystone Cat. No. 787, cabinet assembly, complete. Must be in perfect condition. Price to Robinson, 15 Holly Walk, Enfield, Middx.

WANTED. "QST," April 1945. *Practical Wireless*, March 1943. G3IDG, 95 Ramsden Road, London, S.W.12.

TRADE

BLUEPRINTS. High Gain 10 Metre Converter, with a de-luxe circuit comprising EF91 RF stage, ECC91 double triode mixer and oscillator, EF92 IF amplifier, with stabilised voltage supply via a 7475. 1s. 8d. post free with full instructions. A.S.W.P., 57 Maida Vale, London, W.9.

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A stamped addressed envelope will bring you details of the new series of blue-prints of aerial tested circuits, from single valve to six and seven valve super-hets. In the near future, kits of parts will be offered, both for the home constructor and the Amateur Transmitter and Receiver. Coming off the drawing board shortly is a simple Communications Receiver circuit. Further announcements will be made shortly concerning equipment for the T/A home constructor, including wide ban pre-amplifiers, etc., at prices which will be right for you pocket. Get your name and address on the files NOW by sending your S.A.E. to J.H.G. Box No. C 107.

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Published by Data Publications Ltd., 57 Maida Vale, Paddington, W.9
and Printed by Hanbury, Tomsett & Co., Ltd., Kensal Rise, N.W.10