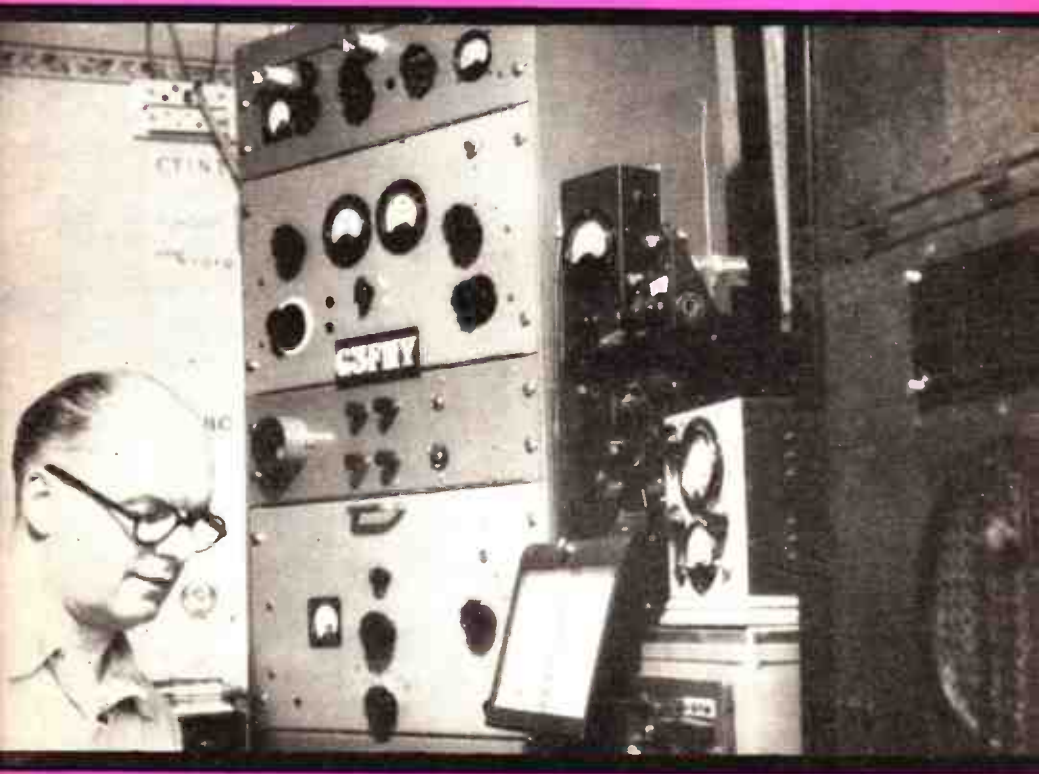
The

RADIO AMATEUR

Vol. 7
Number 10
OCTOBER
1952



IN THIS ISSUE . . .

A Magnetic Tape Recorder. An Effortless Keying System. A Frequency Meter for the Amateur Station. Design of Mains Transformers. Factors in the Design of a Superhet. E.D.R. Jubilee Celebrations. Amateur Bands, S.W. Broadcast and VHF News. Club News.

1/6

CONTENTS

OUR COVER PHOTO

Our cover photo this month shows the station of Mr. A. C. Yates, G3FMY, Whetstone, London, N.20.

The RADIO AMATEUR

Vol. 7 No. 9
October

incorporating " SHORT WAVE NEWS "

Editorial & Advertising Offices : 57 Maida Vale, London, W.9
Tel. CUN. 6518

EDITOR : Arthur C. Gee. G2UK.

Annual Subscription 18*s*.

EDITORIAL

This editorial is being written in Copenhagen just prior to setting off home at the conclusion of a most enjoyable fortnight's vacation made possible almost entirely through the hospitality and genuine goodwill of one's fellow radio amateurs, both here in Denmark and also in Sweden.

Back home one is often surprised at the lack of official encouragement given to social intercourse between amateurs of different countries. Many other organisations seem to make far more of their international connections than do we amateurs in England. Scout jamborees, international sporting meetings, youth club rallies, model aero contests and a whole host of similar activities can be instanced as examples of international co-operation which—provided the competitive aspect is kept in its proper place—do a very great deal to bring harmony into the relations of one nation with another.

Maybe, as our hobby is in itself international in character, personal contacts are not quite so necessary for its full enjoyment. However it is good to learn, that one of the items discussed at the Region 1 IARU meeting mentioned elsewhere in this issue, was the possibility of holding an International Hamfest in Holland next year, a scheme which deserves the utmost support and encouragement from all the National Radio Societies who could help to make such a project successful.

—2UK.

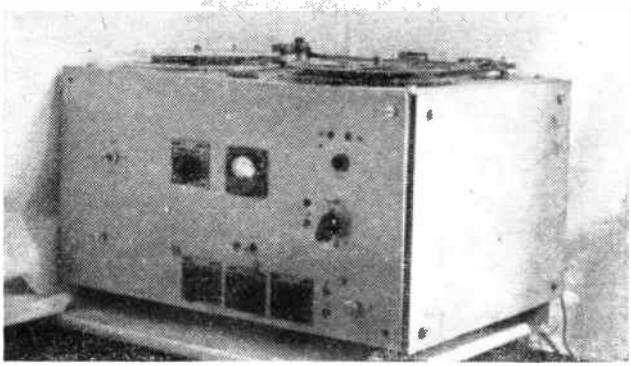
THE EDITOR invites original contributions on short wave radio subjects. All material used will be paid for. Articles should be clearly written, preferably typewritten, and photographs should be clear and sharp. Diagrams need not be large or perfectly drawn, as our draughtsmen will redraw in most cases, 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 " Amalgamated Short Wave Press Ltd."

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

A Companion Journal to THE RADIO CONSTRUCTOR



A MAGNETIC TAPE RECORDER for the RADIO AMATEUR

by

E. KALEVELD, PAØXE

Were magnetic sound recordings just another method of recording sound, it would be difficult to explain the very great interest which is being shown by amateurs in this new development.

There are several resaons however, which make this system of recording and reproducing sound extremely interesting from the radio amateur's point of view, chief of which are the following :—

With relatively little cost a perfectly good mechanism can be constructed, all the parts of which can be turned on a lathe by the amateur or a colleague who has such facilities available.

Mistakes made during recording are not irreparable, erasing can be carried out quite easily and for all practical purposes, the tape can be used indefinitely.

A much better quality with less noise is possible, together with a duration of recording of up to an hour or so on one single spool.

One's repertory can be changed constantly using the same material. Other advantages still could be quoted, such as better contrast—expansion, but the list given will surfice to show the many benefits this method of recording gives over other systems.

A recorder intended for general home use needs rather different characteristics than that intended for professional use. In the first place, cost and simplicity are main considerations. Secondly, there is no need to have a higher frequency response than about 8000 c/s, particularly if the recorder is to be used chiefly for recording radio transmissions where little higher than 8 kcs is reproduced by the present day selective receiver. Loudspeakers in the normal price class have the same limitations, so it seems unnecessary to spend great cost in designing the amplifier for a higher response than that mentioned.

The lower frequency limit has been fixed in the amplifier described herewith at about 30 c/s, to get a good bass response. Consequently, however, special measures are necessary to prevent 50 or 100 cycle mains hum. The use of a low impedance recording head helps in this direction, and particular care must be taken in positioning the step up transformer used to match the low impedance head to the high grid impedance so that the minimum of hum is introduced.

After having used a tape recorder for some time, the writer found that many of the recordings consisted of speech. As in speech the maximum response needed to get good quality need be no higher than 3500 cycles, it seemed a good plan to make provision for recording at half speed, thus lowering the maxiumm high frequency response and doubling the playing time of the spool of tape. Thus a thirty minute spool is used for recording speech lasting a full hour.

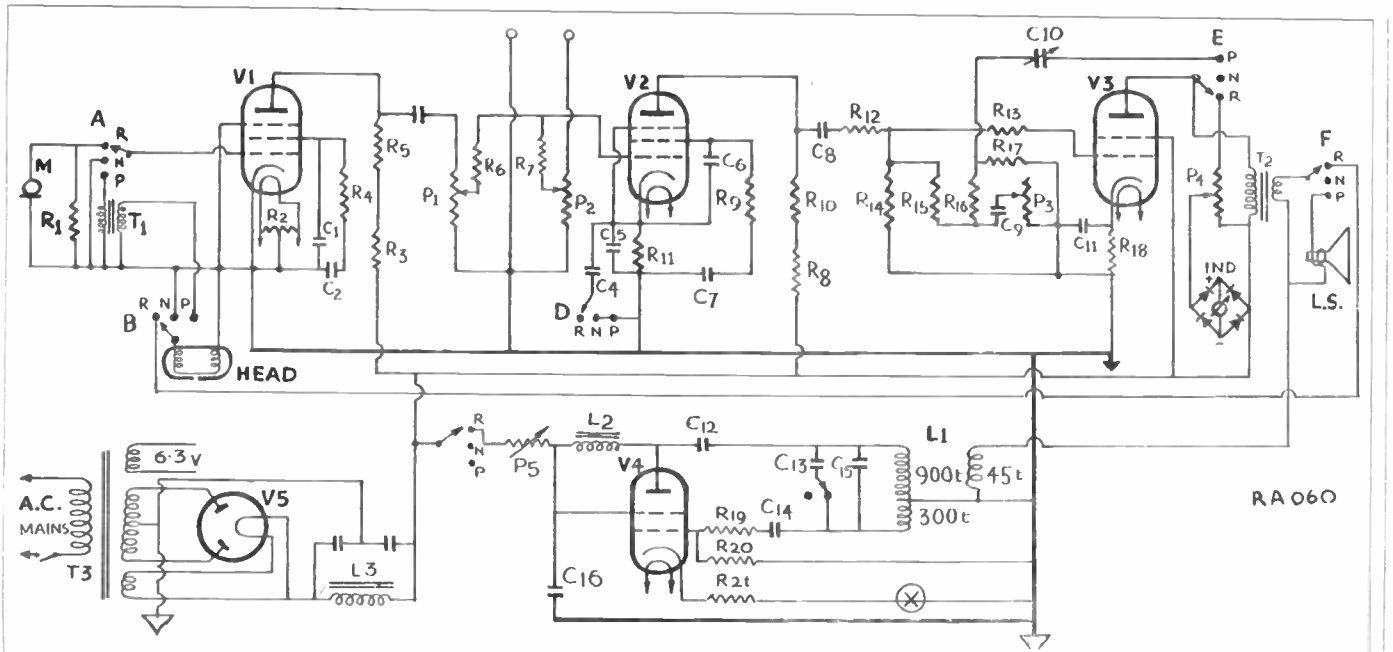
It seemed logical also to use the amplifier as an audio frequency amplifier for a radio receiver, thus combining the tape recorder with an RF tuner, consisting of a mixer and an IF double diode valve, so that an ideal combination of a radio receiver and tape recorder is made.

Construction of Recording/playback amplifier and Bias Oscillator for Low Impedance Head

The amplifier must fulfil the following requirements :—

(*a*) *Sufficient Amplification.* With two pentodes : 6SJ7—EF 50—together with the attentuating frequency-correcting network, sufficient amplification on playback can be used to drive a 6V6 output tetrode to full power ; while for radio recording the diode output fed into the EF 50 control grid does the same. For the microphone, any type of low level crystal or dynamic type can be used.

(*b*) *Frequency-correction.* While recording, the high tones should be boosted in order to attentuate noise on playback. In the playback position both low and high frequencies should be boosted, but the variable tone control system should be such that an overall flat frequency response can be had. This variable



R1	5 *meg* Ω ½ *W*	*R15*	330 *K* Ω ¼ *W*	*C3*	0.1 *μFd*	*L1*	*See text*
R2	100 Ω *centre tapped* 1 *W*	*R16*	220 *K* Ω ¼ *W*	*C4*	100 *μFd* 25 *V*	*L2*	*filter choke* 6*H*. 50 *mA*
R3	10 *K* Ω 1 *W*	*R17*	150 *K* Ω ½ *W*	*C5*	0.25 *μFd*	*L3*	*filter choke* 6*H*. 100 *mA*
R4	1 *Meg* Ω ½ *W*	*R18*	450 Ω 1 *W*	*C6*	0.5 *μFd*	*V1*	6*SJ7GT*
R5	220 *K* Ω ½ *W*	*R19*	1 *K* Ω 1 *W*	*C7*	8 *μFd*	*V2*	*EF50*(*VR91*)
R6	330 *K* Ω ½ *W*	*R20*	68 *K* Ω 1 *W*	*C8*	0.1 *μFd*	*V3*	6*V6 GT*
R7	330 *K* Ω ½ *W*	*R21*	300 Ω 1 *W*	*C9*	2500 *μμFd*	*V4*	6*V6 GT*
R8	10 *K* Ω 1 *W*	*P1*	250000 Ω *carbon*	*C10*	500 *mica vanable*	*V5*	6*V6 GT*
R9	100 *K* Ω ½ *W*	*P2*	250000 Ω *carbon*	*C11*	25 *μFd* 25*v*	*T1*	*mic transformer* 50-100000 Ω
R10	50 *K* Ω ½ *W*	*P3*	500000 Ω *carbon*	*C12*	2000 *μμFd mica*	*T2*	*Output transformer* 7000-8000 Ω
R11	330Ω 1 *W*	*P4*	50000 Ω *wire*	*C13*	1000 *μμFd mica*	*T3*	*Mains transformer* 6*v*. 3.5*A* 5*v*. 2*A* 2 × 260*v*. 100*mA*
R12	100 *K* Ω ¼ *W*	*P5*	25000 Ω 5*W wire*	*C14*	2000 *μμFd mica*	*IND* :	*Meter* 0-1 *or* 0-5 *mA with suitable rectifier.*
R13	1 *K* Ω ¼ *W*	*C1*	0.1 *μFd*	*C15*	1000 *μμFd mica*	*M*	*Crystal mic Head Low-imp Record/ play-back head.*
R14	500 *K* Ω ¼ *W*	*C2*	8 *μFd*	*C16*	8 *μFd*		

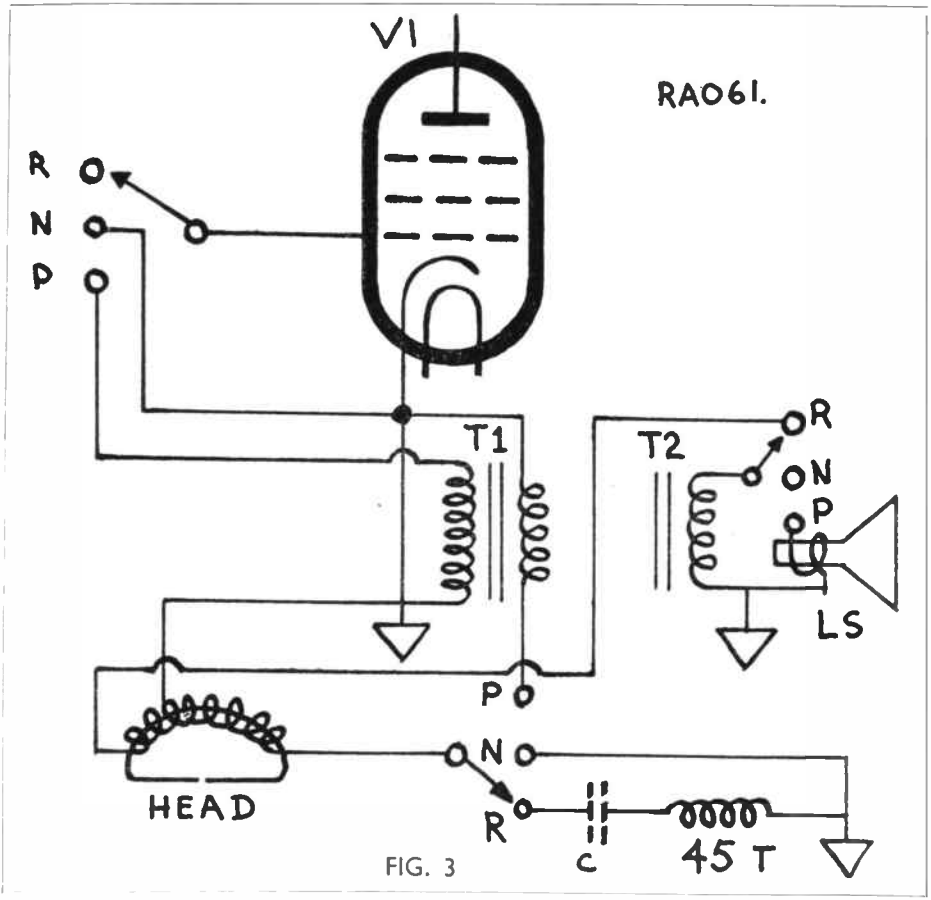


FIG. 3

control system should be switched off while recording, so that every recording has the same tonal quality irrespective of the tone control settings. On playing back, the necessary boosting or attenuation can be carried out.

(*c*) *Switching arrangements*. The head must be connected either to grid (playback) or output transformer (record). This switching arrangement is always a weak link, as there is great possibility of feed back through the switch with consequent howling.

As the switching of the head is performed over three stages, the input and output are out of phase, thus lessening this danger very much. This switch has also to perform the various changes in the frequency correcting network and the switching on and off of the bias oscillator. The switch must have a neutral position to prevent clicks and consequent possible saturation of the head through heavy peaks.

(*d*) *Mixing arrangements*. In recording as well as in playback there should be sufficient gain to allow the use of a mixing circuit, thus permitting one to mix speech and music.

(*e*) *Bias Oscillator*. This should be capable of delivering a pure sine wave of at least 40 kcs of sufficient amplitude. It's amplitude should be variable to match it to optimum performance when different heads or recording materials are used. There should be a means of altering it's frequency by 2 or 3 kcs in case one of it's harmonics beats with a radio station whose programme one wishes to record. This prevents one having to try and accomplish the almost impossible task of shielding the oscillator and it's associated circuits.

(*f*) *The power pack*. The power pack should deliver pure DC. Very good filtering is necessary as any hum in the amplifier shows up twice, once as it is recorded and again during playback.

The Circuit

Fig. 1 shows the complete amplifier with it's bias oscillator and power back. A low impedance head is used, having one winding only for playback, record and bias injection. Should a commercial head be used, it will be found that there very often is a tap provided. This can be ignored or the head can be connected as shown in Fig. 2, the greater number of turns being used either as the bias winding or as the playback winding.

It is important to provide only one earthing point in each stage to which all ground connections are made. To minimise hum pick-up all leads up to the grid of V2 should be shielded and all resistors and condensers wrapped up in tin foil (after due insulation). The shielded cable should have as little capacity as possible i.e., small diameter of wire and large diameter of metal braid to prevent loss of high tones. Using this small capacity cable makes all the difference at reduced tape speed.

The playback—record switch should be a double section switch, three position three contacts each section. Contacts A, B and C (Fig. 1) should be mounted on one section, D, E and F on the other.

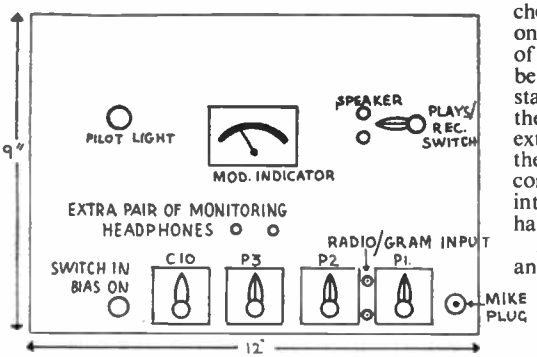
The second stage is conventional, except for the switching of the cathode bypass. In the record position the 100 μfd bypass is lifted from ground, giving a rise in frequency response of about 6 dB per octave.

The frequency correcting network with degeneration and tone controls is only operative in the playback position. C10 controls the degree of degeneration and consequently the bass, whereas P3 serves to lift the high notes should a recording be a bit too full of bass. P4 should be adjusted under actual operating conditions. Empirically a deflection on the meter should be found which represents the correct recording volume. This point should be marked on the meter and P4 left untouched thereafter.

Should feedback occur, it may be necessary to put a metal shield between the two sections of the switch but with careful building of the amplifier, this should not be necessary.

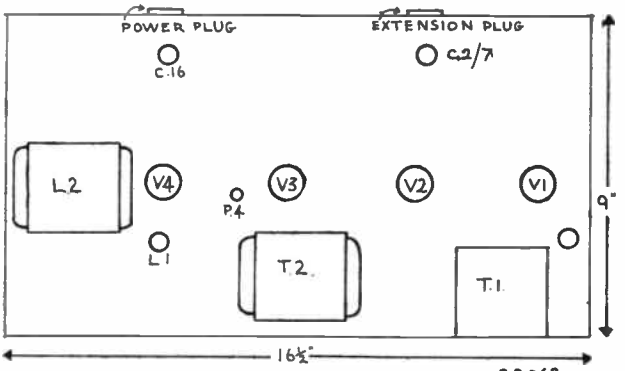
The circuit used for the bias oscillator is not the most economical from the components point of view, but it is by far the most reliable source of RF, much more than the generally advocated Harley circuit, which is very tricky in operation. Coil L can be home-made by winding 1200 turns of No. 28 SWG on a former $\frac{5}{8}$" diameter, the winding to occupy $1\frac{1}{2}$" length. The secondary coil is wound over the primary and consists of 45 turns No. 22 SWG. The primary should have a tap at 300 turns. The operation of the bias oscillator can be checked by listening on a broadcast receiver to one of it's harmonics beating against a carrier of a BC station. This beat note may however be very awkward if it happens to fall against a station which one wants to record. A switch is therefore included which will switch in a little extra capacity, thus shifting the frequency of the oscillator by about 5 kcs. Even expensive commercial units suffer from this heterodyne interference and it is strange that this solution has never been used nor published before.

P5 serves to control the amount of RF bias and is adjusted once for a certain head with a



HEIGHT OF CHASSIS 2"

FIG. 3



Layout and panel dimensions used in the authors recorder. The latter will need varying if a commercial deck is used.

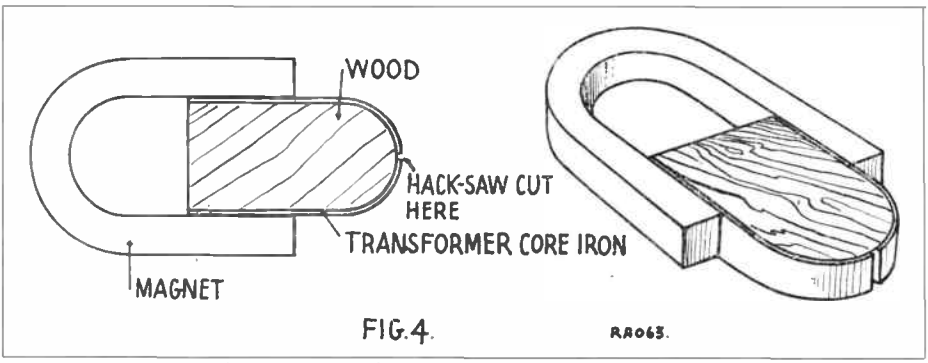


FIG.4. RA063.

certain make of tape. It is best to adjust it under actual working conditions for best quality.

The powerpack should be built on a separate chassis to prevent hum pick-up. Especially is this so if the pack is eventually to be mounted in a cabinet with the playing desk. The motors in the latter may prove a sufficiently bad source of hum that the amplifier must be moved about to get hum free reproduction and this is easier if the power pack is separate from it.

Fig. 3 gives an idea of the layout used in the writer's unit and the front panel measurements are given to fit a tape desk a description of which it is hoped to give in a subsequent article. With the many playing desks both complete and in kits now available on the English market, it is felt that the description given herewith of the electrical side of the recorder will prove of more interest to the English reader in the first place that the mechanical side which will follow later for those who wish to try their hand at this side of the business.

Finally a word about erasing. It is possible to erase with this amplifier unit by connecting a low impedence erase head in the cathode of the oscillator at the point marked X. The low impedance erase head, if home-made should have about 200 turns. However, erasure by a permanent magnet is quite sufficient. It does give a slightly higher noise level, but that is only audible with no signal and the gain full up. A very good erase magnet can be made from a horseshoe magnet from an old loud-speaker or pick-up, fitting it with a pair of pole pieces. A piece of transformer core iron is clamped by a piece of wood between the legs of the magnet and the centre cut through by a hacksaw and afterwards polished. Fig. 4 gives an idea of this suggested construction.

S.W. BROADCAST BANDS

HONOUR ROLL

1.	Sidney Pearce	130
2.	Arthur Cushen (NZ)	127
3.	Jack Fairs	88
4.	Mike O'Sullivan	86
	Roy Patrick	86
5.	Ivor J. Street	81
6.	Carl Shapiro	80
	Stanley Coppel	80
7.	William P. Griffith	75
8.	Ian Hardwick (NZ)	66
9.	Dr. James Kyle	64
10.	Manfred Lepple (Germany) ..	63
11.	Bert Clear	55
12.	Ronald Thorndike	54
13.	John Whitington	50
14.	A. J. Allmey	43
15.	Michael Hutchins	42
16.	John Bell	37
17.	Phil. Allwood	36
18.	J. S. Bollard	35
19.	Alex Mackenzie	34
20.	Paul R. Warner	30

THE MODEL ENGINEER EXHIBITION

Radio controlled models will again be an outstanding feature at "The Model Engineer" Exhibition, which will be opened by the Duke of Edinburgh at the New Royal Horticultural Hall, Westminster, on 20th Oct.

Among the radio controlled marine entries there are a cabin cruiser "Ione," valued at £200, which can be seen regularly on the Round Pond at Kensington ; the motor launch "Geeba," with three speeds forwards and reverse, 5 pre-set rudder points and intermediate control, searchlight, hooter and bell, with a range exceeding half a mile ; H.M.S. Diana, a radio controlled working model destroyer, with all her guns elevating and swivelling and her torpedo tubes swinging to port or starboard.

The class for radio controlled aircraft, introduced last year, has found a response with models of a Keil Kraft Falcon with a 96" wing span, sailplanes with wing spans of 90" and 84", and aircraft of free-lance design. The lightest weight among the radio controlled aircraft so far entered is 28 oz. —a remarkable achievement in engineering.

AN EFFORTLESS KEYING SYSTEM

by ANGUS D. TAYLOR, G8PG

Introduction

The control system to be described in this article does indeed live up to its name. Designed in the first instance for controlling a CW station it can, merely by replacing RL3 by a relay carrying a few more contacts, be equally well adapted to give full control of a phone transmitter. Briefly, the object behind the design was to produce a system whereby the only operation necessary to commence transmitting was to press the key, while when the time came to change over to reception the mere act of ceasing to send would be sufficient to shut down the transmitter and bring the receiver back into operation. In addition, provision was made for " netting " the VFO without putting the whole transmitter on the air, for providing " side tone " for keying monitoring and for using transmitter and receiver at the same time if required. To get the genuine " T9X " signal from the exceptionally good commercial VFO available, arrangements were also incorporated which keep the VFO running continuously during transmission and to incorporate a built-in keying filter which would provide a very soft keying characteristic and eliminate all trace of clicks.

Operation

Though the circuit may look somewhat complicated at a first examination, the operation is quite straightforward and should be easily understood from the following explanation. DC, for the operation of the various relays is provided by means of two 24 volt bridge rectifiers fed from a common 24 volt winding on the mains transformer. One rectifier (Rec 1. on the diagram) provides the operating voltage for the side tone oscillator, the Keying relay RL1 and the delay circuit energising relay RL2. This voltage is controlled by the morse key, the side tone oscillator and the two relays being energised when the key is pressed. The second 24 volt rectifier (Rec 2. on the diagram), provides the energising voltage for the VFO-Receiver HT switching relay, RL3 and the aerial change over relay, RL4. The pulses of current necessary to operate this part of the circuit are supplied via the contacts of the delay system energising relay, RL2, each time the key is pressed.

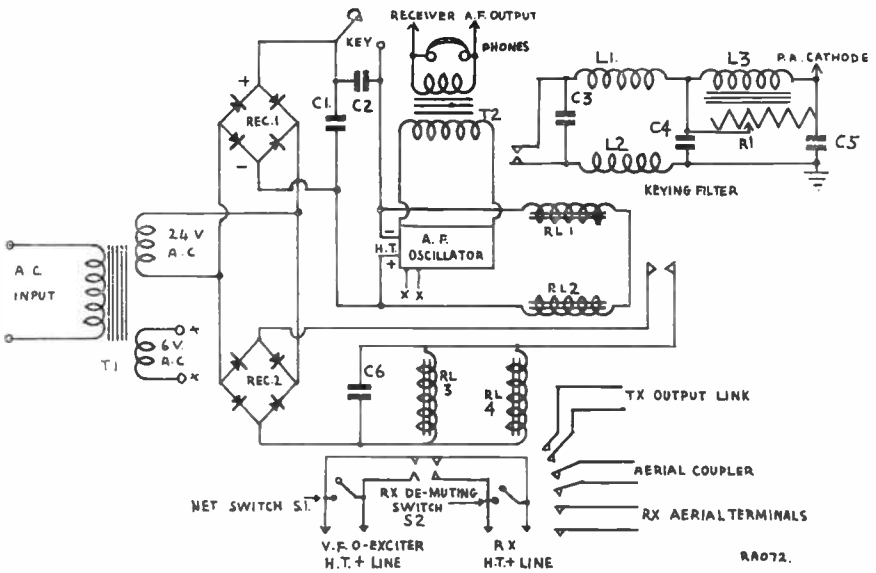
The sequence of operation of the various relays is as follows. Before transmission commences, none of the relays are energised, the contacts on RL3 which are in series with the receiver HT positive line are closed and the aerial change-over relay is in the " receive " position. The transmitter is thus dead and the receiver in operation. Should it be desired to put the VFO on a given frequency while in this position, it is merely necessary to close the " Net " Switch, S1, which applies HT to the VFO and exciter, thus allowing the adjustment to be made.

When the key is pressed, RL1 and RL2 are energised, RL1 completing the PA cathode circuit and RL2 applying a voltage across the coils of RL3 and RL4. Connected across the coils of these two relays is a 2,000 microfarad condenser, C6. The voltage applied via RL2 begins to charge up this condenser and, after a delay of about quarter of a second, sufficient voltage appears across this condenser to energise RL3 and RL4. These relays immediately operate, switching off the receiver, switching on the VFO and exciter and changing the aerial over to " send." Transmission can then be carried on in the normal way, RL1 keying the P.A. and RL2 supplying a series of pulses of current to C6 which keep the charge on this condenser at such a value that RL3 and RL4 remain energised.

This state of affairs will continue until such time as sending ceases for more than about half a second. If more than half a second does elapse between pulses from RL2; C6 will discharge through RL3, RL4 to such an extent that there will no longer be sufficient voltage available to keep these relays energised and their contacts will open, putting the whole station back to receive. So, at the end of a transmission or if it is desired to " listen through " during a transmission, it is only necessary to stop sending for half a second and the system does the rest. The " side tone " oscillator also receives its HT voltage via the key, thus providing audio keying monitoring. The output from this oscillator is fed to an output transformer the secondary of which is connected in parallel with the receiver output transformer secondary, thus ensuring that " sidetone " is automatically heard whenever the key is pressed. It will be noted that, if the system is to function correctly, all transmissions must start with a quarter second dash. In practise this causes no difficulty as it becomes habit after the system has been in use for a few days.

Construction

The construction should present little difficulty as there is nothing critical about the layout. In the writer's model, the whole unit with the exception of the aerial change-over relay is accommodated in a metal box 12 inches by 6 inches, the aerial relay being accommodated in the aerial coupler cabinet and receiving its energising supply via a twisted pair line. All leads to and from the unit go via Belling Lee multi-pin plugs and sockets, thus making it very easy



C1. 25 mfd., 25v. C2.2 mfd., 450v. C3.1 mfd., 450v. C4.5 mfd., 450v. C5.5. mfd., 450v. C6.2000 mfd., 25v. L1, L2. R.F. choke. L3, 30 Henry choke. R1, 5K, W.W. Recl. 1, Rec. 2. 24v Bridge Rectifier. RL1, RL2. 1000w High Speed Relay. RL3. 3000w, 2 pole, make-break relay. RL4. 3000w D.P.C.O. Aerial relay.

to withdraw the chassis for inspection or adjustment. RL1 and RL2 are midget high speed relays of the Creed type and RL3 and RL4 standard G.P.O. telephone relays. These latter will require little adjustment, but the high speed relays should be very carefully adjusted both as regards tension and contact gap, particular care being taken to see that the locking screws on the adjustable contacts are really tight. A little extra time spent on these adjustments will make all the difference as far as reliability of operation is concerned. Should the delay on RL3 and RL4 be too short, the value of C6 should be increased, the reverse being the case if it is too long.

No diagram of the audio oscillator is included, as it is a perfectly conventional unit using a 6J5 and an audio transformer. Should any trouble be encountered in getting the 6J5 to oscillate at an audible frequency, a 0.25 megohm grid leak shunted by a .001 mfd condenser should be put between the earthy end of the audio transformer grid winding and the cathode of the valve. The keying filter incorporated will be found to be very efficient and careful adjustment of R1 will produce a true " ringing " keying characteristic together with a complete absence of clicks. It is advisable to bring a broadcast receiver into the operating room and adjust R1 to just past the point where no key click can be heard in the receiver, as this point gives best all-round results. It is important not to ignore the 2 microfarad condenser across the key contacts, as this removes the final trace of clicks. This condenser must be located AT THE KEY CONTACTS, not in the unit itself. Returning to the AF oscillator for a moment, it may be mentioned that due to the small amount of HT smoothing, the note will be rougher than that normally produced by this type of oscillator, though it is still adequate for monitoring purposes.

Conclusion

The writer has had this unit in operation for several years and would not part with it. Provided the relays are correctly adjusted at the start maintenance is practically nil while the ease of operation well repays the constructional work involved. This is particularly true during long spells of contest or DX operation. As for keying, the shaping characteristics of the filter have brought the most favourable comment from many different parts of the world. Why tie oneself in knots with a row of switches when a machine can do the job automatically ?

A FREQUENCY METER for the AMATEUR STATION

by

L. A. CHINNERY

The SWL who aspires to a transmitting station of his own will know that he must provide himself with a means of measuring frequencies to %0.1±. Financial difficulties in his way (as in the case of the writer), will cause the constructor to abandon his ideas of BC221's and get weaving with the tool box. The average amateur cannot duplicate a commercial type of instrument, but he can fulfill the required accuracy with comparative ease.

Consideration of the circuit in Fig. 2 will show that the instrument consists of a built-in detector/check oscillator and a VFO. The latter covers a range of 1.7-2.0 Mcs, harmonics being used on all bands down to 30 m. The check oscillator is used for calibration, and can be switched off when not wanted. The HT supplied to the instrument should be taken from a stabilised power pack.

Having built the instrument, the writer was

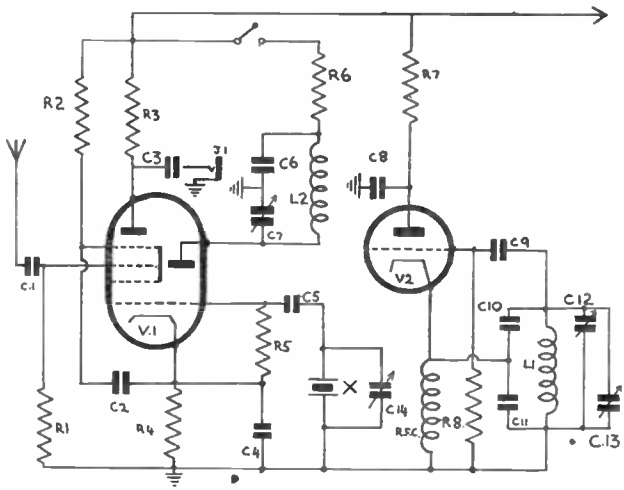


FIG. 2 HETERODYNE FREQUENCY METER RA074

The component value and layout of the circuit are shown overleaf. HT supply should be from a stabilised power pack.

The writer set out to achieve mechanical as well as electrical stability. To this end he obtained a chassis, panel and cabinet of very rigid construction, the cabinet being well ventilated. The chassis was braced with heavy iron strips and all nut and bolt fixings were fitted with lock washers. When the whole job was assembled and all such fixings tightened, they were doped with a small dab of quick drying paint.

The layout of major parts will be seen in the diagram of Fig. 1. All small parts mounted under the chassis were fitted on tag boards, and all wiring was strained tight to ensure no vibration in the RF fields of the oscillators.

faced with the task of getting it to perk, and also of calibrating it. LT and HT were applied and the main Rx tuned to 2 Mcs with the regeneration advanced (here we still use an OV1, OM !). The check oscillator switch was turned on and the air trimmers C7 and C14 manipulated until a beat note was heard. The VFO was then swung on to the frequency, thereby checking the operation of same. Tuning around on the Rx was then carried out to check that the VFO was capable of tuning the entire band. All being present and correct, calibration could now proceed.

The writer had a small ECO on 100 kcs, which he now proceeded to beat with the

BBC Light Programme on 200 kcs. The harmonics of this were picked up on the Rx at the four points on Top Band, and the tuning left on 2 Mcs again. C14, the crystal trimmer, was then adjusted to zero beat with the 2 Mcs harmonic. Bringing the VFO down to zero beat gave a 2 Mcs check. This is the reference point for all future checks, using C13 to set the VFO to zero beat.

The check oscillator in the meter gives out copious harmonics to almost the 'n'th, and so those occuring in harmonic relation to Top Band were checked by first finding them on the Rx, and then zero-ing with the VFO (i.e. a check at 7 Mcs will give a check at 1750 kcs, and at 30 Mcs one can obtain frequencies of 1777.7, 1764.7 and 1875 kcs). With all harmonics checked and double checked, the writer was able to draw a series of overlapping curves, each covering 50 kcs, and from these curves make a table of each 1 kcs point in the band. With the slow motion dial used on the prototype, the average frequency change per division is 200 cps, on a dial which can be read to one part in 2000 or better. The actual frequency change will be found to vary from about 100 cps at the HF end to about 300 cps at the LF end.

Operation as a frequency meter is effected as follows. The meter is switched on and allowed to settle for 30 minutes. Then phones are plugged into J1 and the 2 Mcs point is checked against the crystal. The instrument can then be left running without HT until wanted. To check the frequency of an incoming signal zero beat VFO with signal on Rx, and calculate harmonic. The same will apply to checking a low power oscillator used in the shack, but when the user is licenced and using a Tx, the internal detector can be used in the same way as for checking calibration at 2 Mcs. Another transmitting use is to beat the VFO with the Tx whilst listening on the internal detector. Adjust for an audible beat. Now the meter can be used as a keying, and what is more important, *note* monitor.

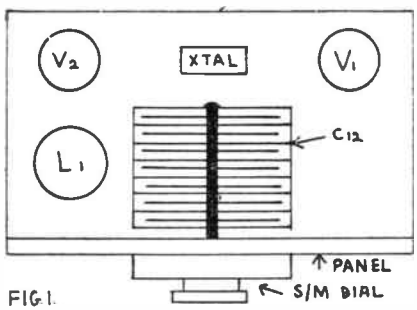


FIG 1.

VIEW OF FREQUENCY METER FROM ABOVE, SHOWING POSITION OF MAJOR PARTS RA073

PARTS LIST

Condensers, Mica or Ceramic

C1, 5, 9, 10	100 $\mu\mu fd$
C8	1000 $\mu\mu fd$
C11	450 $\mu\mu fd$

Paper (Non Inductive)

C2, 3, 4, 6	.1 μfd

Ceramic Air Trimmers

C7, 13, 14	25$\mu\mu fd$ max.

Air Spaced Variable

C12	200 $\mu\mu fd$ max.

Carbon Resistors, all 2 watt unless stated otherwise

R1	1,000,000 Ω 1 watt
R2	250,000 Ω
R3, 5, 8	50,000 Ω
R4	200 Ω
R6, 7	1,000 Ω

VALVES : V1 : 6K8 V2 : 6J5

X : Crystal 1000 K/cs., RFC : Tx type RF choke

Coils

L_1 30 *Turns spaced to 3" on 1¼" diam. Amphenol former.*

L_2 *Wearite medium wave RF coil.*

J_1 *Single circuit Phone Jack.*

THE DESIGN OF MAINS TRANSFORMERS

Part 3.

by W. E. THOMPSON

Layer Length and Winding Height

The number of turns which can be wound on a layer will depend on the "turns per inch" figure of the wire, and the length of the layer. It must be remembered that the cheeks of the coil bobbin will reduce the available length of the winding window in the stampings, and as we propose not to take the wire right to the edges of the paper interleaving, our layer length is still further reduced. We can generally allow about 0.25in. to 0.375in. as lost space—0.3in. can be taken as a fair average value. Deducting this from the length of the winding window will give the actual layer length, so multiplying this by the turns per inch of the wire will give us the number of turns per layer. If this figure is now divided into the total turns for the winding, the number of layers is given, and finally dividing the number of layers again by the turns per inch will give the height of the winding in inches. To this must be added the total thickness of paper interleaving to obtain the gross height of the winding.

As an example, suppose window length is 1.875ins., and 1700 turns of 34 SWG enamel are to be wound—one turn of 1-mil. paper will therefore be allowed between layers. Lost space in layer length is 0.3in., as above, then,

Layer length = 1.875 — 0.3 = 1.575 ins.
Turns per in. = 93 for 34 SWG enam (from table).
Turns per layer = 93 × 1.575 = 146 turns.
Number of layers = $\frac{1,700}{146}$ = 11.6, or 12 to the nearest whole layer.
Copper depth = $\frac{12}{93}$ = 0.129 in.
Paper interleaving = 11 × 0.001 = 0.011 in.
Gross winding height = 0.129 + 0.011 = 0.14 in.

This same calculation is performed for each winding on the coil. To the sum of all the gross winding heights we add the total thickness of insulation between windings. Add to this figure the thickness of the bobbin centre, and say about 0.05in. to allow a small space between the outside of the coil and the window of the core. The total figure so found must be equal to, or a little less than, the width of the winding window—if it is greater, the coil obviously will not go in the space available, and the windings will have to be re-designed.

Mean Turn

It is now necessary to calculate the length of wire for each coil, so that we can find out how much wire it will contain. From this we can then determine the appropriate resistance, the voltage drop in the winding, and the copper loss. These figures will enable the winding to be so designed that due allowance is made for copper loss, and some correction of turns made to overcome the effect of the losses.

In calculating the length of mean turn, it will be appreciated that the mean length of the primary turns, wound on the inner part of the bobbin, will be less than the mean length of, say, a heater winding wound on the outside of the coil. Windings situated between these inner and outer windings will clearly have mean turn lengths which are different. Consider the cross-section of a typical bobbin shown in Fig. 3. The core has a centre limb of 1.0in. wide, the stack being 1.25ins. thick. The bobbin is made of paxolin 0.0625in. (1/16th in.) thick. The insulation between windings is assumed to be three turns of Empire tape 0.005in. thick, so inter-winding insulation occupies 0.015in.

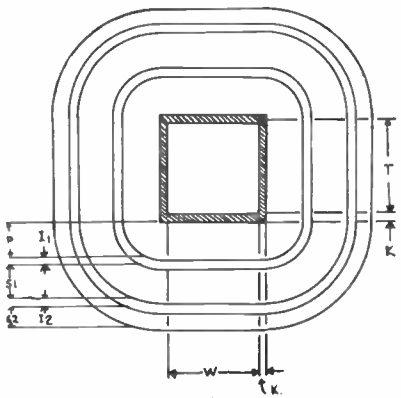


FIG.3 CROSS-SECTION OF COIL

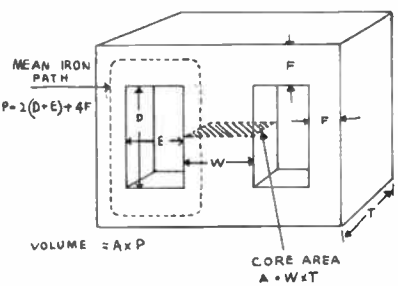


FIG.4 CALCULATING VOLUME OF IRON IN CORE

RA065

As the number of layers on the coil build up, the wire bends round the corners and approximates to a circular arc. In addition, the larger the coil becomes the greater is its tendency to become circular ; the flat sides become curved and therefore get increasingly longer. The circular shape at corners has to be taken into account, since it shortens the mean turn somewhat, but the lengthening of the turn due to curvature of the sides is very small, and can be ignored, except for large transformers.

It will be seen that the mean turn of the primary will be half-way between the bottom and top layers of that winding. In the diagram Fig. 3. the symbols have the following meanings.

W = width of core centre limb.
T = thickness of core stack.
K = thickness of bobbin material.
P = gross height of primary winding.
I_1 = thickness of insulation between primary and secondary.
S_1 = gross height of first secondary.
I_2 = thickness of insulation between secondaries.
S_2 = gross height of second secondary.

The length of the primary mean turn will be,

$$MT(P) = 2W + 2T + 8K + \left(6.3 \times \frac{P}{2}\right) \text{ approx.}$$

The factor 2W+2T+8K will be constant for any particular coil, and once having been evaluated can be represented by a constant C. The primary mean turn is then,

$$MT(P) = C + \left(6.3 \times \frac{P}{2}\right) \text{ ins.}$$

The mean turn length of the first secondary, S_1, then becomes,

$$MT(S_1) = C + \left\{6.3 \times \left(P + I_1 + \frac{S_1}{2}\right)\right\} \text{ ins.}$$

And similarly, for secondary S_2, the mean turn becomes,

$$MT(S_2) = C + \left\{6.3 \times \left(P + I_1 + S_1 + I_2 + \frac{S_2}{2}\right)\right\} \text{ ins.}$$

It is clear that the factor within the brackets becomes larger as the number of windings increases, and is actually taking into account the gradual lengthening of the curvature at the corners, and assumes that the sides remain reasonably straight. The formula can be extended in a similar way for any number of windings, and an examination of the three formulae above will make the method clear.

The length of wire for each winding can now be found by using the formula appropriate to the particular winding. To show the application and method, let us work out a hypothetical case. Using the diagram of Fig. 3 and the derived formulae, assume values,

W = 1.0 in.
T = 1.25 in.
K = 0.0625 in.
P = 0.32 in.
I_1 = 0.015 in.
S_1 = 0.26 in.
I_2 = 0.015 in.
S_2 = 0.046 in.

Factor C
= 2W+2T+8K = (2 × 1.0)+(2 × 1.25)+(8 × 0.0625)
= 2+2.5+0.5 = 5.0 ins.

Primary mean turn is,

$$MT(P) = C + \left(6.3 \times \frac{P}{2}\right)$$
$$= 5 + \left(6.3 \times \frac{0.32}{2}\right)$$
$$= 5 + (6.3 + 0.16)$$
$$= 5 + 1 = 6.0 \text{ ins.}$$

The secondary S_1 mean turn is,

$$MT(S_1) = 5 + \left\{6.3 \times \left(0.32 + 0.015 + \frac{0.26}{2}\right)\right\}$$
$$= 5 + (6.3 \times 0.465)$$
$$= 5 + 2.92 = 7.92 \text{ ins.}$$

And finally, the secondary S_2 mean turn is,

$$MT(S_2) = 5 + \left\{6.3 \times \left(0.32+0.015+0.26+0.015+\frac{0.046}{2}\right)\right\}$$
$$= 5 + (6.3 \times 0.633)$$
$$= 5 + 4 = 9.0 \text{ ins.}$$

Length of Wire

It is a simple matter now to find the length of wire for each coil, it being necessary only to multiply the mean turn length already found by the total turns in the winding, and divide this by 36 to find the length in yards.

Weight of Wire

An approximation of the quantity of wire required for each coil, can be found by dividing the length of wire by the figure given under " Yards per Pound " in the wire table. This figure refers to bare wire only, so the actual length of wire on a one-pound reel will be slightly less due to the weight of covering. It was not considered expedient to show a yards-per-pound figure for each kind of wire in the table, since the weight of coverings varies by an unknown factor. Even so, manufacturing tolerances permit of slight variations in nominal wire diameter, which must of course affect the number of yards to the pound. It will be sufficient for our purpose if we add, say, 10% to the figure obtained for weight of wire, to allow for insulation.

Resistance of Winding

The resistance of a winding under ambient temperature conditions is given by multiplying the wire length by the " Ohms per yard " figure given in the wire table. Under working conditions, however, a loss occurs in the winding due to current having to overcome the resistance of the wire ; consequently, the wire will tend to get warm and its resistance will increase to some value above the nominal value. To obtain a more accurate estimate of winding resistance, we add some 15 to 20% to the figure given in the wire table. A more convenient way of doing this is to use the actual ohms-per-yeard value given in the table, multiply by the length of wire, and again multiply by a factor 36/30 which will then give the resistance of the wire under " warm " conditions. For other degrees of correction, the figure of 30 in the denominator can be increased ; an example will be found later in the article. To show how the formulae are

applied, in case there is confusion in your mind, consider the following case :

Total turns = 2,500 of 38 SWG enamel.
Mean turn = 6.2 ins.
Yards per pound = 3056, bare wire (from table)
Ohms per yard = 0.8491 (from table).

$$\text{Length of wire} = \frac{2500 \times 6.2}{36} = 432 \text{ yards.}$$

$$\text{Weight of wire} = \frac{432}{3056} = 0.14 \text{ lb. approx.}$$

Adding 10% gives 0.156 lb., which is about 2½ ozs.

$$\text{Reisistance of winding} = \frac{432 \times 0.8491 \times 36}{30} = 438 \text{ ohms}$$

Note that the nominal resistance of 432 yards of 38 SWG (yards × ohms per yard) works out to 367 ohms.

Voltage Drop

As a winding has resistance, it is clear that a certain voltage will be dropped across it when it carries current. Ohm's Law gives this quite simply, since $E = I \times R$. In the case of windings other than those connected to a rectifier, we need do no more than take the product of winding resistance and current in the winding. It will be remembered, however, that when considering rectifier windings, we found that the actual watts were higher than the nominal output watts. Therefore, to calculate the voltage drop in such windings, we must use the total watts of the winding. For example,

Full-wave rectifier, output 250-0-250V, 50mA.

$$\text{Nominal load} = \frac{250 \times 50}{1000} = 12.5\text{W.}$$

$$\text{Actual load} = 12.5 \times 1.34 = 16.8\text{W.}$$

The total voltage across the whole winding is 500V, so the current will be,

$$I = \frac{16.8}{500} = 0.0336\text{A, or } 33.6\text{mA.}$$

If the whole winding has a resistance of 1,000 ohms, the voltage drop becomes.

$$E = 0.0336 \times 1000 = 33.6\text{V.}$$

For each half of the winding, the drop is obviously 16.8V.

Copper Loss

The voltage drop across the winding due to its resistance is a measure of its copper loss. This loss, in the case of the primary, results in a reduced voltage being available to energize the transformer, so it is necessary to reduce the primary turns to compensate for this. We therefore multiply the voltage drop by the turns per volt, and deduct this result from the primary turns previously calculated, thus finding the actual primary turns.

With the secondary windings, the voltage drop will result in less volts being developed across the windings, so extra turns must be added to effect compensation. Therefore, the resultant figure obtained by multiplying voltage drop by turns per volt is added to the calculated turns for the windings. This applies to all secondaries on the transformer.

When dealing with tappings on a winding such as would be provided on a primary to suit various mains voltages, it is sufficiently accurate to make the taps at points which are ratios of the maximum turns, rather than make a separate calculation for each tapping. As an example of the above calculations, assume values,

Primary, 200-220-240V. Primary current 180mA. Resistance 85 ohms. Calculated turns, 960 total.
H.T. secondary, 350-0-350V 50mA. Resistance 450 ohms total. Calculated turns, 2,800 centre-tapped.
L.T. secondary, 6.3V 3.0A. Resistance 0.32 ohm. Calculated turns, 25.

These figures are chosen purely at random just to show the working, and they bear no relation to any specific design. Turns per volt, by inspection, is 4.

$$\text{Primary voltage drop} = \frac{180 \times 85}{1000} = 15.3\text{V.}$$

Turns compensation = 15.3 × 4 = 61, say 60.
Corrected primary turns = 960 — 60 = 900.

$$\text{Primary taps will be made at } \frac{200 \times 900}{240} = 750 \text{ turns,}$$

$$\text{and } \frac{220 \times 900}{240} = 825 \text{ turns for the 200V and 220V tappings.}$$

$$\text{H.T. secondary watts} = \frac{350 \times 50 \times 1.34}{1000} = 23.4\text{W.}$$

$$\text{Secondary current} = \frac{23.4}{700} = 0.0335\text{A.}$$

Secondary voltage drop = 0.0335 × 450 = 15.0V
Turns compensation = 15 × 4 = 60.
Corrected H.T. secondary turns = 2800 + 60 = 2860, centre-tapped.

The calculation for the L.T. secondary, as explained earlier, follows simpler rules.

L.T. secondary voltage drop = 3 × 0.32 = 0.96V.
Turns compensation = 0.96 × 4 = 3.84, say 4 turns.
Corrected L.T. secondary turns = 25 + 4 = 29 turns.

In an actual design we should now check over the figures for winding heights if it appears that the increased number of turns on the secondaries might take up more space. Usually, the fewer primary turns and extra secondary turns will result in very little difference in the overall dimensions, since one tends to balance the other.

The total copper loss is the sum of the losses in all windings, being the product of voltage drop and current in each coil. For the above example, they would be,

$$\text{Primary,} \frac{15.3 \times 180}{1000} = 2.76\text{W.}$$

H.T. secondary, 15 × 0.0335 = 5.03W.
L.T. secondary, 0.96 × 3 = 2.88W.
Total copper loss = 2.76 + 5.03 + 2.88 = 10.67W

Iron Loss

An approximate figure for iron loss is given by allowing 1.0W loss for 1.0 lb. of iron. Stalloy stampings weigh a little less than 0.3 lb. per cu. in., so by calculating the volume of the core, converting it to pounds weight will give the loss in watts. A general method of finding the volume of a core is given in Fig. 4. The magnetic path length is multiplied by the core area, giving cu. ins., volume ; the weight in pounds, and the loss in watts, is then found by multiplying the volume by 0.3.

FACTORS in the DESIGN of a SUPERHET

by Peter J. L. BINNS, M.Sc. Part 2.

Noise Level

The importance of this subject can hardly be over-emphasised in the design of a superhet, especially one covering frequencies above about 10 Mc, and much has already been written about it. It is convenient to review the subject briefly here, before considering the double superhet.

The question of noise level becomes more important as the frequency rises. This is partly-because atmospheric noise becomes less, and partly because RF stages become less efficient. At VHF, the triode is preferred on account of its lower noise figure (especially as a grounded grid stage), and some otherwise conventional communication receivers use a

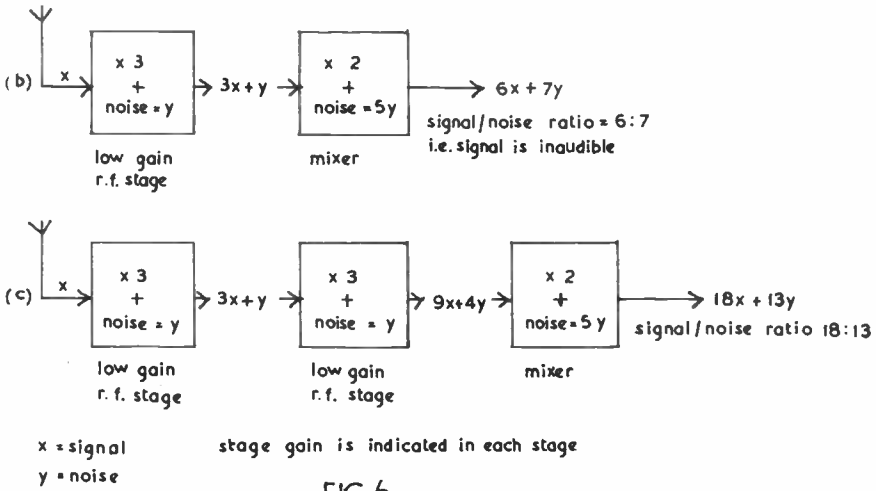


FIG. 6.

RAO66

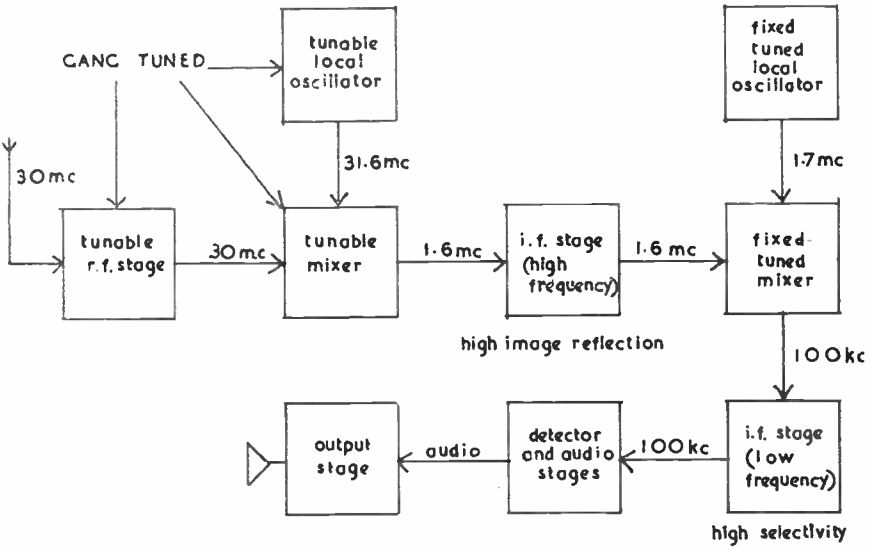
Assuming satisfactory mechanical construction, layout, and so on, there will be an inherent noise level in any high gain receiver, even when no signal is being received. This is derived from the operation of the valves, and no amount of shielding or screening will alter it. Any signal must overcome this to be audible, and unless this condition obtains, further amplification is useless. Thus the noise level of the first stage is of great importance, and high gain is essential if only one stage preceeds the mixer. This is because the noise level (i.e. the amount of noise contributed) of a pentode used as a mixer is about five times greater than that of the same pentode used as an RF amplifier. Multigrid mixers, triode hexodes and heptodes, etc., give an even higher noise figure. The example given in Fig. 6 will demonstrate these facts. In the first case (Fig. 6a), the RF stage gives a gain of six times, and the mixer a gain of two : the resulting signal is amplified twelve times, but the noise level is amplified seven times. In the second case, (Fig. 6b), where the RF stage gives a gain of only three, the noise has swampfd the signal. The solution (Fig. 6c) is to add another stage of RF amplification, or to use a valve of higher gain.

double triode as mixer/oscillator. This is particularly useful in compact minature receivers where no RF stage is included. However, for the frequencies we are considering, a normal RF pentode preferably of high slope, will be suitable for the first stage(s). The noise contributed by the IF stages is generally insignificant, as the signal level is much higher here. Audio stages should be designed and arranged to prevent introduction of hum. A frequent cause of this is a thermionic diode used as a noise limiter : a crystal diode is much less prone to hum pick up.

The Double Superhet

A convenient solution to some of the design problems outlined previously is the double superhet. The incoming signal is amplified by an RF stage, then converted to a high IF, thus ensuring good image rejection. After amplification, the signal is passed through a second converter stage, and emerges at a low IF, giving good selectivity (Fig. 7).

The sole disadvantage of this arrangement is a rather higher noise figure resulting from two conversion stages. This will be aggravated if a converter is used ahead of the main receiver,



BLOCK DIAGRAM OF TYPICAL DOUBLE SUPERHET

FIG. 7

RA067

or if a "Q5er" is used—though this latter should be quite unnecessary with a properly designed double superhet. In order to realise the advantages of the double conversion principal, the first IF must be made high enough to give really good image rejection on all bands—at least 1.6 Mc. Similarly, the second IF must be made sufficiently low for really good selectivity, i.e. below 100 kc. Unless these conditions are met, the more complex circuit is not justified.

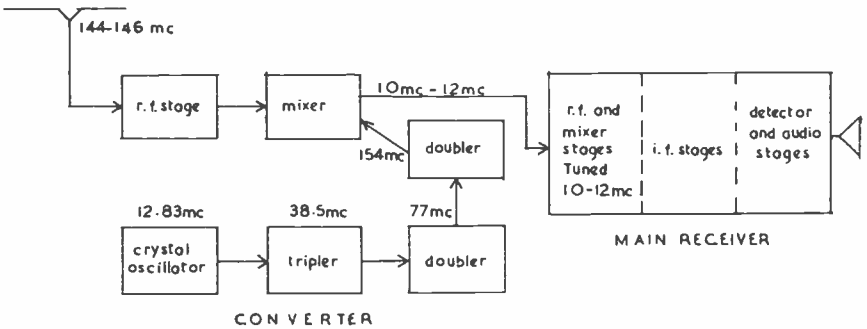
The use of two conversion stages requires two local oscillators, one fixed tuned. The absolute stability of the fixed tuned oscillator must be above reproach : a crystal control is ideal, though not essential. The advantages of using double conversion on frequencies up to about 10 Mc are negligible. From the amateur constructor's point of view, a "straight superhet" (abominable phrase—a contradiction in terms if ever there was one !) is much more attractive. The writer does not recommend the construction (or purchase) of a double superhet unless interest is chiefly in the 10 and 20 meter bands. For VHF work, converters will be used in any case (see below), and if special interest is shown in the 10 meter band, a converter can with advantage be used here also.

Converters and Preselectors

Converters are designed to extend the tuning range of the normal superhet, and preselectors to improve its performance.

As their name implies, converters use a conversion stage to change the frequency of the incoming signal to a frequency tunable on the receiver : in fact, the assembly becomes a 'double superhet' over the range of the converter. With a properly designed amateur receiver, converters will be of the VHF variety, to cover the 145 Mc. band, and possibly the 430 Mc band also. Many ex-Service receivers do not tune the 10 meter band, and a converter will remedy this defect. If special interest is shown here, the use of a really efficient converter has much to recommend it, even if the receiver will cover the band. This is because, unless the receiver was specially designed for it, its performance will begin to drop off at 10 meters. The use of a really efficient RF stage is of great value here.

In detail, converters differ widely, depending chiefly on the band they are designed to cover. Separate mixer and oscillator valves are frequently employed, because at higher frequencies the conventional triode hexode does not work well—60 Mc is about the limit. A miniature double triode is sometimes



BLOCK DIAGRAM OF CRYSTAL CONTROLLED CONVERTER FOR 145mc.

FIG. 8.

RAO68

employed as mixer—oscillator at 145 Mc, but the use of balanced push—pull mixer and oscillator gives improved results. This also applies to RF stages, one or more of which are more or less essential. IF amplifiers may be added between the mixer and the main receiver.

If the band to be covered is quite narrow, broadband fixed tuned RF amplifiers may be used. In a VHF converter, the IF should be made high enough to ensure good image rejection. Any value from 7-15 Mc. is satisfactory, and transformers for these frequencies are now available. The stability of the oscillator in VHF work is of paramount importance, and by fixing the frequency, and controlling it with a crystal, complete stability can be achieved. This means that the IF must be tuned in order to tune the converter, i.e. the main receiver is tuned (Fig. 8). The detailed design of VHF converters is beyond the scope of this article.

Preselectors are additional RF stages for use ahead of the main receiver. Their chief function is as a voltage amplifier, increasing the sensitivity of the receiver : thus they must possess a very low noise figure. Over a narrow frequency range such as an amateur band, they may be made sufficiently broad to require no tuning. However, a very worthwhile improvement in image rejection may be obtained by using a sharply tuned preselector. If more than one stage is used, an external gain control is an advantage (See S.W.N. Oct.—Nov., 1950, the P1428 preselector, by F. Baldwin).

Practical Considerations

To conclude this series, some practical design factors will be considered. These are not intended to cover all aspects of building a superhet, but rather to draw the attention of the constructor to some points which are not always mentioned.

First, then, a note with regard to valves. Modern minature all glass valves, with B7G or B8A bases are coming into wide use, and are particularly efficient at higher frequencies. Thus they find a ready use in the RF mixer, and oscillator stages of superhets. But, apart from their small physical size, there is nothing whatever to recommend their use in IF and audio stages : rather the reverse, in fact, as the greater size of the normal octal base allows better screening between socket connections, etc.

There is much to recommend the use of an RF valve running full out, with no AVC applied, in order to get maximum gain for a given noise figure. A manual gain control, conveniently in the cathode lead, is essential for use with strong signals : a high slope valve is desirable. With proper layout, there should be no instability, even without screening. The B7G based EF91 or 6AM6 is a useful valve here, on account of its high gain, and the American 6AK5 can also be recommended. The B9G based EF50 and EF54 perform well, but take up more space. Standard octal valves still give a very good account of themselves (the maximum frequency is, after all, only 30 Mc), and the 6AC7 and 6SH7 are very satisfactory.

Triode hexodes have been developed to such an extent that they are probably difficult to beat as frequency changers, though some prefer separate mixer and oscillator, thereby enabling the latter to be designed and built for maximum stability. With a reasonably efficient RF stage, the advantages of using a triode mixer are not sufficiently evident. A stabilised HT supply should be provided for the oscillator anode and mixer screen. This, coupled with reasonable layout and rigid wiring should give complete stability and freedom from drift.

The choice of IF amplifier valves is not so

wide, as AVC will be applied to at least one stage, perhaps all. The only minature valve at present available which has fairly high slope combined with variable—mu characteristics is the 6BA6. However, we have seen that standard types are quite satisfactory here, and the EF39, 6K7, 6SK7, and 6SG7 come to mind. Detector and audio stages require a little comment, but two points deserve mention. One is that the infinite impedence detector merits wider use : the selectivity of the last IF tuned circuit can be kept high, owing to negligible loading from the detector. By using a double triode valve, the other half can be used as the BFO, AVC rectification will require a separate diode, but if a double diode is used, the other half can be employed for some purpose (' S ' meter limiter, or perhaps noise limiter, if a well screened type such as the EB34 is used). The second point is that a large power output valve is not only unnecessary, but wastes a large amount of current, both HT and LT, readers who only use their receiver for communications work could use a small triode or RF pentode (6J5 or 6J7 type), which will give a few hundred milliwatts of audio. The SP61 has been recommended for this job, but remember it requires 0.6 amps of heater current ! For those who like a bit more audio, the EL32 is a useful valve. It will give nearly as much power as the familiar 6V6, but the saving of 10 ma. of HT and 0.4 amps of LT is well worth while. The use of push pull audio stages in even the most elaborate communications receivers is to be strongly deprecated—if a high quality audio section is desired (and assuming the receiver band width can be broadened sufficiently to justify it), it should be built as a separate unit.

The number of AVC controlled stages should be carefully considered in the light of main listening interests. The DX man will prefer his receiver to be only lightly controlled, so as not to use too much precious RF, or lose gain. The man who listens to the more powerful broadcast stations wants better AVC control. And, for accurate ' S ' meter action, the AVC delay must be kept small. In general, two controlled stages should be satisfactory. We have seen that the RF stage is best left free, so we are left with the mixer and IF stages. AVC can be applied to the mixer, provided no " pulling " results, and to all the IF stages : but perhaps it is better to leave one IF stage free, and control it with a manual gain control. The ' S ' meter can then be worked from the other IF stage(s), with no interference from this manual control.

In conclusion, the constructor is particularly advised to consider with great care the exact valve types he intends to use. There are a very large number of valves available, either new or surplus, to the amateur at the present time, and there is no excuse for sticking slavishly to the conventional types. It is surprising what a difference valve capacities and screening make, especially in RF and IF circuits, and it is very desirable to experiment until the optimum performance is obtained. A number of valves quoted as direct equivalents show wide differences in characteristics : they are, of course, equivalent when used in an ordinary broadcast receiver, but in a carefully designed and critically adjusted communications receiver, the story is very different. The present tendency is for amateurs to buy their communications receivers, and this is probably a good thing, in view of the advanced metal work needed in construction. But there are few receivers, even today, which do not profit from carefully designed and performed modification. The amateur is in the happy position of being able to design his receiver for one person only, and to spend just as much time as he wishes in making it fit his requirements.

On the Higher Freqs. (*Contd. from p.* 378)

time, G3AUS was being received at S9 with the beam ENE. Turning the beam East, ON4HN was heard at 569, and DL6EP S6 on phone and S7 on CW. The Cornwall stations were then calling the DL, and off the back of the beam they were S6 to S8. It was the only real opening to the Continent so far this season, but there did not seem to be a lot of activity. The rest of the month was poor with low signal strength, bad fading and low activity.

Some of the more interesting calls during the month include :—G3ANB, G3WW, G4MW, G5ML, G2IQ, DL6EP, and F8BY. New stations heard, G3AVO/A, G3IEX, G4DC, and G5RO.

Reg says he does'nt hear G6UH these days, and hopes your conductor is not turning into a ' Contest only Man ' (Heaven forbid OM !! It's just that we are swamped with WORK these days, but by the time this appears, we hope to be right back in circulation again during week-ends at least).

Reg Smith, Nr. Taunton, has now completed his 3 element beam, and when a few faults on the converter have been ironed out, he will be listening in real earnest. We will look forward to some reports from the Taunton area.

Well that seems to be all for this month again. A very sincere thank you to everyone for the fine batch of interesting reports. We hope that we have dealt with them all in a manner satisfying to the reporters, and that our readers will find them interesting. Reports are welcomed, and should be sent direct to your conductor at 176 Station Road, Hayes, Middlesex by the 6th of the month, for publication on the 1st of the following month.

Good luck and 73 to all. G6UH.

P.S. Have you heard G5TZ (Old Jumbo of the Isle of Wight) on the band yet ? We haven't!

E.D.R. JUBILEE CELEBRATIONS

COPENHAGEN, AUGUST 1952

A series of dispatches giving some impressions of the occasion

Tuesday, August 19th

Our regular readers will already be familiar with the name of Harold Andrews, G5DV. They will recall that it is he who organises such excellent overseas tours and that we have already published in this periodical, accounts of the trips he has conducted to Denmark, Sweden and Holland.

This year the trip was again to Denmark. An invitation had been extended to Harold to bring a party of British amateurs over to participate in the E.D.R. Jubilee Celebrations, which were to take place in August. Memories of the hospitality which had been shown us by our Danish colleagues on the last occasion, left no doubt but that Denmark must be the venue for this year, and in due course a party of eighteen or so radio amateurs and their friends embarked from Harwich on Sunday, August 17th, en route for Esbjerg ; your editor having the good fortune to be one of the party.

For most of us, the voyage to Esbjerg passed without incident. Thence by train to Copenhagen, which we reached about 7 p.m. on Monday. Imagine our surprise when on emerging from our carriages, we found a large party of OZ amateurs, complete with welcoming banner, on the platform to greet us. What a welcome ! The rest of the passengers on the train must have wondered just what V.I.P.'s we were, to warrant such a reception ! All our old friends were there and after a round of handshaking and greetings we were escorted to our hotel and given an hour to " get squared up." Then they were back for us. A party had been arranged for us at an open air cafe, so off we went. No time was going to be lost before we got into the swing of Copenhagen's gaiety.

Sitting in that cafe once again under the trees, with a clear sky overhead, from which the stars tried unsuccessfully to compete with the street lights below, we sipped our Carlsberg in the lights of gaily shaded oil lamps. To the accompaniment of an accordion band, we were soon reminiscing about the last time we had all met there, two years before. Foremost in the minds of all, must have been the thought, ' what a wonderful hobby this Amateur Radio is, to bring together people from different countries in such a way that they can instinctively meet and enjoy each other's company just as though no difference of nationality or tongue distinguished them.'

Wednesday, August 20th

One of the best features of these overseas visits arranged by Harold Andrews, is that no hard and fast programme is forced on one. One's time is free to spend as one wishes, and those who have not already planned their own programme of shack visiting, sight seeing tours, swimming or just drinking beer, are soon taken under the wing of the local amateurs and shown around. Hence these last few days will have been spent differently by each member of the party. The next occasion at which all will be present being the E.D.R. Banquet and Ball on the Saturday night.

New members of this year's trip express great surprise at the size and gaiety of Copenhagen ; the latter quite equals that of more famed European centres of night life. A motor coach tour round the City reveals not only historic grand old buildings, but in the suburbs shows that Copenhagen contains some of the most delightful modern flat accommodation one could find anywhere. Magnificent blocks of flats and flower-covered verandahs with gardens in between, prove that the most up to date architectural building can have a unique charm of its own. But the social story is much as at home. Accommodation is expensive, the cost of living is high and such luxurious standards are only obtained by both husband and wife going out to work. Denmark has a population of 5 million. 350,000 married women are in full time employment, butter is 8/- per lb., and meat nearly as expensive. Coffee is the only rationed commodity. These few statistics remain in our minds from many others told us by the guides who conducted us around, and form a background to help us appreciate the life and conditions of our OZ radio amateur friends.

Thursday, August 21st

A number of the English party were present at the Airport today to welcome the President and the Secretary of the R.S.G.B., on their arrival to attend the Celebrations. On Saturday morning a meeting will be held between officials of the Societies present, at which future I.A.R.U. plans will be discussed.

One of the numerous private parties arranged between OZ and G amateurs.

Monday, August 25th

The high spot of the E.D.R. Celebrations was of course the Banquet and Ball held on Saturday, 23rd August. It seemed strange to the English party to be setting out for a Banquet at five o'clock in the afternoon but the invitations were for that time and we little guessed what an evening we were in for. The function was held in a historic building once the homes of Dukes, a magnificent place which lent grace and dignity to the occasion. Prior to the Banquet, the anterooms were alive with the buzz of greetings as old friendships were renewed and calls familiar on the air turned into living personalities. For your Editor, there were far too many names to mention. By the time we filed into the Banqueting hall, one was quite confused with the long list of old friends one had met again.

Those readers whose duties take them to public functions, will be interested to learn that nothing in England can compare with such a function in Denmark in regard to the length of speeches, of the function itself, nor of the variety and quality of the dishes served and the wines consumed. We sat down to the Banquet somewhere about six thirty. We staggered up from it somewhere about eleven o'clock. One should say however that the Danish custom of eating is to take long breathing spaces between each course—which the English party found very useful to enable them to adjust their now naturally a trophied stomachs in readiness for the next course. Instead of saving up all the speeches to the end, they took place between each course, a procedure which has much to recommend it.

It was disappointing, from the English point of view, that with one or two exceptions, no resumé of the speeches were given in English. Mr. " Dud " Charman delighted the gathering by giving some of his remarks in Danish and Mr. John Clarricoats, also speaking on behalf of the R.S.G.B., gave his address in English. He drew attention to the fact that E.D.R. started twenty-five years ago with only seven members. He himself was, in fact, their first foreign member and he recalled many contacts with the Danish Old Timer using the call 7MT.

In addition to the speeches, a number of songs specially written for the occasion were sung included one dedicated to the long suffering XYL. Prior to the Ball, entertainment was provided by one of Denmark's leading radio entertainers and by a troup of excellent vocal artistes. One could write at great length of this most enjoyable function, the climax to a memorable week, but space forbids and I must mention the serving of the cream, from dishes illuminated by electrically lit iced figures, the tables illuminated by candlelight, the souvenir ash trays, the special copy of " OZ "—the E.D.R. Amateur radio journal, the flags decorating each table, as instances of the thought taken to make this function one of the most pleasureable anyone could ever have attended.

Thursday, August 28th

Stockholm. It seemed strange to be sitting in a restuarant hearing all about the Radio Exhibition in London from one who had already seen it first hand. SM5ZK Bo Palmblad had only that day flown in from London and expressed the opinion that it was quite the best exhibition that he had ever seen. This was encouraging because at the International Fair now on in Stockholm, the British exhibit was not one which drew widespread favourable comment. Seven members of Harold Andrews party, having got as near to Stockholm as Copenhagen, decided to re-visit that most beautiful of all the Northern Capitals and see old friends. Bo Palmblad's hospitality must be experienced to be believed and once again particular thanks must be expressed to him for having found five of the party accommodation in a City packed full of visitors to the International Fair. The party he gave will be remembered for a very long time, we believe, by the two lady members of the party.

Your Editor was particularly pleased to meet again Hans Eliasson, SM5WL, Editor of the Swedish Amateur radio magazine " QTC." A most enjoyable evening was spent at his home once again. 20 metres being too full of short skip to make the band worthwhile working, we spent a profitable evening discussing the problems of Amateur radio publishing in our respective countries. There are, of course, far fewer radio Amateurs in Sweden than there are in England, and " QTC's " circulation is about 2,000 copies monthly. Like the *Radio Amateur*, its editorial policy is trying to cater for both the SWL and the transmitting fraternity—not a particularly easy editorial task.

Swedish transmitting Amateurs are fortunate in being able to use up to 500 watts. There can hardly be a garden in Sweden which has not several tall pines tree in it, so high and well placed aerials are common. The technical standard of the equipment is excellent, these factors all helping to provide the high degree of efficiency usually associated with transmissions from SM stations. Stockholm itself houses some 400 transmitting Amateurs—which provides its QRM problems even though they are not all active.

As in Copenhagen, TV is slowly taking the air, transmissions being radiated once a week at present.

This must bring to an end the short series of dispatches, from which your Editor hopes readers will gather something of the spirit of the E.D.R. Celebrations and of the cordial welcome and hospitality Amateur radio once again gave us in OZ and SM Lands.

And once again may we say, "Thank you, Harold."

BROADCAST BANDS REVIEW

by JACK FAIRS

All Times G.M.T.

" Nf "—New Frequency.

When these notes are published, the holiday season will be well and truly finished, and with the dark evenings rapidly approaching, the " knob-twiddling " season will be commencing once again ; we hope these pages may provide something for all Broadcast enthusiasts " to get their teeth into!"

EUROPE

Belgium. From September 1st to November 30th (and also during the period March 1st to May 31st, 1953) the following schedule will be operated by the Belgian National Broadcasting Service at Brussels. Firstly the 100 kW Station ORU at Wavre :—5970 kcs at 2330-0500 ; 9745 kcs at 1700-0500 ; 11850 kcs at 1215-1300 (to the Far East) and 1700-2330 ; 15335 and 17860 kcs at 1000-1200 (both for Congo reception).

9745 kcs carries programmes for the Congo in Dutch and French at 1700-0200 and the American Service at 0200-0500. 11850 kcs has Dutch for South Africa at 1800-1900, English at 1900-2000, French at 2000-2130, and Dutch/French at 2130-2315 for North America. 5970 kcs is beamed on America with Portugese and Spanish at 2330-0100, Dutch and French at 0100-0200, French for Canada at 0200-0300, and English for the U.S.A. at 0300-0500.

OTC Leopoldville, Belgian Congo (50 kW) relays these programmes at 0100-0500 on 6140 kcs. The frequencies given here may be liable to alteration, and a full list of available channels was included in last month's *Review*. During December, January and February a new schedule will replace the above (World Radio Handbook and " Sweden Calling DXers!").

Roy Patrick reports the tests during August, and says that ORU on 9745 kcs was barely audible in Oldham (same here OM !), and 11850 kcs is also not very satisfactory ; W. P. Griffith of Ashtead, Surrey, reports 11850 kcs S8 around 1910 during the English programme. Sidney Pearce lists 9745 kcs in the evenings with bad Moscow-QRM from 9740 kcs (also from Lisbon on 9740 after 2200 —Scribe) and 11850 kcs with noise spread plus QRM at times from Warsaw (11845), but generally better than the 9 mcs outlet ; the

DX programme was heard on 11850 kcs only at 1930 (Wednesday, August 20th).

Portugal. " Emissora Nacional," Lisbon, has been logged on 17750 kcs (Nf) around 2000. (Radio Sweden and Scribe). Bert Clear of Sutton, Surrey, lists 11027 kcs with fine signals and a good musical programme at 1800-2100.

The " Radio Free Europe " transmitters on 9604, 9717 and 11725 kcs are located at Lisbon (Ian Hardwick and Scribe).

Albania. " Radio Tirana " is now on a new schedule, though frequencies remain as 6560 kcs (500 watts) and 7850 kcs (3 kW). English transmissions are at 0445-0500 and 2100-2115, French at 0545-0600 and 1845-1900, and German at 1900-1915. A concert is broadcast daily at 2130 to close at 2200 (WRH).

Yugoslavia. " Radio Yugoslavia," Belgrade, has been using 15245 kcs for the new 100 kW Tx, in parallel with the regular 6100 kcs outlet. English is on the air at 1600-1615, 1815-1830 and 2145-2200 (Radio Sweden). Sidney Pearce reports hearing these English programmes, and gives the 19 mcs channel as nearer 15235 kcs, adding that they announce as " 49.18 and 19.69 metres." Stanley Coppel of Belfast lists 6100 kcs at 1815 and 2145 with bad QRM on both occasions.

Poland. The English transmissions from " Polskie Radio," Warsaw, are now as follows, frequencies in use being given in brackets. 0630-0700 (6115) ; 1730-1800 (9525, 7155) ; 1815-1845 (11740, 11800, 7145) ; 1850-1920 (7155, 9525, 11845) ; 2045-2115 (7175, 6115, 9600) ; 2115-2145 (7145, 11800) ; and 2230-2300 (5995, 7155, 9525, 11845 kcs). Of these, two are new frequencies : 5995 and 11800 kcs (Mike O'Sullivan and Sidney Pearce).

Greece. W. P. Griffith has been hearing Chania with S7 signals on approx. 7120 kcs to close at 2000 with the Greek National Anthem ; the call is " Edho Khania." (Greece, Crete and the Aegean Islands all count as one country, OM.) Another station located in Crete, and which seems to be a new one, is " Radio Herakleion " at Herakleion with 50 watts on a frequency varying around 6480 kcs. This item comes from *Universalite*, organ of the Universal Radio DX Club of California.

AFRICA

Ivory Coast. Star item this month comes from Roy Patrick, who has had a good catch in the shape of " Radio Abidjan " on 7210 kcs during July (What times, OM?). Roy says his report was answered within 12 days by air mail and M. G. Picot, Director of the station, writes : " We were absolutely delighted by your letter and to know that our transmission is audible on 7210 kcs in the north of England. I take this opportunity to tell you the new increase of our radio, which jumps from 350 watts to 1 kW." The call is " Ici Abidjan." Yes, the Ivory Coast certainly counts as a separate country—nice work OM !

Sudan. Omdurman is listed by URDXC on 9710 kcs (Nf), and heard signing-on with western recordings at 0350 until starting the regular Arabic programme at 0415. Sidney Pearce is still hearing them well in the evenings near 7000 kcs in parallel near 9735 kcs.

Egypt. John Whittington of Worthing wants to know the exact frequency of Cairo near 11800 kcs. Well, OM, Cairo has moved from 9715 to 11815 kcs (Nf) and now broadcasts News in French at 1820, English at 1830, Greek at 1840 and Italian at 1850-1900. Sidney Pearce reports this new channel, and adds that English talks and music are broadcast from 1900.

P. M. White of Williton, Somerset, reports for the first time this month, and lists Cairo on the new 11 mcs frequency ; at 2030 on August 10th, during the recent Egyptian crisis, he heard a long speech by the Prime Minister, Mr. Aly Maher, followed by an interview with General Naguib. 11815 kcs was noted here with S9-plus signals around 1830 recently, and reception is generally better than the old 9 mcs outlet. They announce as " 222.6, 267.4 and 25.39 metres " (Scribe).

Angola. The 11865 kcs station of the " Radio Clube de Angola " at Luanda, is listed by URDXC as CR6RA, while Bert Clear reports CR6RA on 11035 kcs at 1730-1815 with fairly good signals. W. P. Griffith has noted CR6RJ " Radio Clube de Huila," Sa da Bandiera, on 10050 kcs, S8 at 2000 but some severe CW QRM. Mike O'Sullivan also includes CR6RJ in his log this month :—Q3-4 S2-3 at 1900, again with CW on the frequency.

Tangier. The " Voice of America " Relay station Tangier 10 is now using 15175 kcs (Nf) at 1415-1745, and Tangier 5 is testing to Europe on 15340 kcs at 1900-2015. P. M. White asks if we have the exact frequencies for these stations in the 19 and 25-metre bands at the various times of day, so here is this information, according to the latest VOA frequency schedule. 11710 kcs, 1200-1215 and 1515-2145 ; 11760, 1045-1215 and 1230-1800 ; 11775, 2100-0700 ; 11830, 0600-1215 and 1230-1830 ; 11835, 0315-0600 ; 11870, 1900-2200 ; 15130, 0630-1145 ; 15175, 1415-1745 ; 15240, 1800-2000 ; 15270, 1030-1445 ; 15285, 2115-2145 ; 15340, 0730-0800, 1200-1845 and 1900-2015 ; and 15440 kcs, 1615-1900.

We would appreciate readers' comments on lists such as this. Do you find them useful or consider them a waste of space ?

NEAR EAST

Yemen. The new 25 kW Tx, reported being installed here in our June issue, has been assigned 5985, 9705 and 11905 kcs, and it will be the same station already reported operating from San'a on 7385 kcs (URDXC). Those three frequencies, by the way appear to us to be already three of the worst QRM-spots on the dial !

Turkey. F. C. Boucher, Rochester, expresses surprise at finding " Radio Ankara " on 15160 kcs with French at 2015 ; see the July *Review* OM ! English broadcasts from " Radio Ankara " are as follows :—1230-1315 over TAV (17820 kcs) ; 2100-2145 over TAP (9465 kcs) and TAU (15160 kcs) : 2315-2400 over TAT (9515 kcs) (P. M. White and " Radio Sweden "). Ronald Thorndike lists TAV with English News at 1230.

Afghanistan. Sidney Pearce has received a letter from Sayed Edris Ali-Shah, London Correspondent for Kabul Radio, 134 Fellows Road, Hampstead, London, N.W.3., and quotes : " I have been asked by the Foreign Broadcasting Division of Kabul Radio, Kingdom of Afghanistan, to thank you for your letter reporting reception of our programmes. Kabul Radio sends you greetings . . . " The letter continues by asking for reports as to times and wavelengths of transmissions from Radio Kabul, types of programmes preferred, etc. Your Scribe also received a similar letter, and since then Sayed Edris Ali-Shah has asked Kabul to send us some technical information on the Broadcasting Station, together with transmission times, etc. Such information will appear in these pages as soon as received.

Syria. Damascus on 11915 kcs is heard S9 at 2130 in English, though subject to bad distortion at times (Mike O'Sullivan, West Hartlepool). The English Newscast is at 2215-2230 daily (P.M. White).

Israel. Stanley Coppel tells us he is now collecting reception reports for " Kol Zion Lagolah " (" The Voice of Israel "), and they can be sent to him at 540 Antrim Road, Belfast, Northern Ireland. Stations are 4XB21 (6830 kcs), 4XB24 (8170 kcs) and 4XB31 (9010 kcs) (Scribe).

ASIA

India. John M. Simpson of Hassocks, Sussex, " returns to the fold " after a long absence, with a FB list of DX he has been hearing, including mention of three AIR frequencies on the LF end ; VUD2 Delhi on 4940 kcs around 1645, and VUC2 Calcutta, 4880 kcs, heard S7 in parallel with the other VUD2 on 4940 kcs, which was an S9 signal at 1700

Indonesia (Moluccas). United States DXers are hearing Ambon on 11083 (or 11089) kcs around 1000 ; signals are spoiled by severe CW QRM (URDXC). This must be a move of YDR from 4865 kcs, unless a second TX has opened-up ; it is rather significant that 11084 kcs was at one time used by Makassar (Scribe).

Taiwan (Formosa). BED4 is confirmed as being the call-sign for the 11920 kcs frequency of " The Voice of Free China," Taipeh (Ian Hardwick, Thames Line, New Zealand). Sidney Pearce still hears this station at 1800 with Chinese music, identification at 1804, followed by News in Russian read by a YL. The English transmission still commences at 1820. John Simpson reports BED4 around 1830 and adds that " this one gets harder to winkle out as the QRM from Budapest (11910) and Russian jamming gets to work on it " (HI).

John has also been logging BED7 on 7132 kcs at 1615 (Q4 S6-7) with all-Chinese programme and eventually wiped-out by QRM around 1655. Yet another Chinese-speaking station is reported by J.M.S., this one on 10065 kcs at 2220 to close at 2232. This would surely be BEC26 at Tsoying—Scribe.

Air Force Station BEC32 at Taipeh is heard at 0930 in Australia on 9775 kcs, though often listed on 8990 (URDXC).

Mongolia (U.S.S.R.). Ulan Bator has moved from 6395 to 6518 kcs (Nf) according to a Californian DXer (URDXC).

Uzbeck (U.S.S.R.). Radio Tashkent, 6825 kcs, has daily English transmissions for India at 1500-1530 and 1615-1630, according to recent air mail verifications received by Manfred Lepple (Stuttgart, Germany) and Bert Clear.

Vietnam. " Radio France-Asie," Saigon, has been a truly terrific signal on 9750 kcs, being logged Q5 S9-plus at 2200 with news in French followed by Native music ; at 2230 the " Knightsbridge March " precedes the English News bulletin, and sign-off is around 2252 (Ron Thorndike and Scribe). The English programme schedule is sent along by Sidney Pearce, Ian Hardwick and Manfred Lepple, and reads as follows :—2230 on 9750 kcs, 2330 on 7230 kcs, 0130 on 11935 kcs, 0900 on 15430 kcs, and 1400-1600 on 11935 kcs.

PACIFIC

Australia. " Radio Australia " Station VLC7, 7220 kcs : Q5 S8 at 1600 with the transmission for South East Asia, closing at 1615 with " God Save the Queen " (Simpson). VLC7 is often quite strong from around 1530 (Pearce). This frequency opens at 1030 with the Forces' programme to Japan and Korea. (Hardwick). VLR9 Melbourne, 9680 kcs, has been heard with the ABC Home Service and good signals from around 0600, carrying the BBC News at this time, followed by the ABC News at 0610 and records at 0615 (Pearce). John Simpson heard an Australian station on this frequency around 0725 ; the schedule of VLR9 is 2230-0830, and that of VLH9 (also 9680 kcs) is 0830-1330 (Sats. to 1400).

VLB17 is now using 17790 kcs (Nf) and heard opening at 0255 with the " Radio Australia " Forces' programme (Hardwick).

New Zealand. ZL2 Wellington, 9540 kcs : heard regularly from 0745, sometimes S6 but occasionally much weaker (Simpson). ZL2 logged with good signals from 0700, also announcing ZL8 on 9620 kcs, but this frequency not heard for the QRM (Pearce).

Phillipines. The Educational and Missionary Station DYH4 at Dumaguete City, Negros Island, operates daily at 1000-1330 on 6055

kcs with 250 watts power. Programmes in the Visayan language are broadcast at 1015-1100 (Suns.) and 1130-1215 (Tues., Thurs., Sats.) ; at all other times in English. Reception reports should be sent to Silliam University, Dumaguete City, Negros Oriental, Philippine Islands (World Radio Handbook).

DYH2 of the Cebu Broadcasting Company, Cebu City, 6140 kcs, has been heard in Australia with news and music around 0930 (URDXC). DYH2 relays DYRC (600 kcs MW) with 1kW at 2200-1600.

DUH2 " The People's Station " at Manila, 6170 kcs, has been logged by Ian Hardwick at 1000 with an English programme of recorded music. Schedule of this one is 2100-1600.

NORTH AND CENTRAL AMERICA

United States. Here are the latest news items concerning the VOA stations. WLW06 Bethany, Ohio, is now on 15220 kcs (Nf) at 1900-1930 (for South America). WLW01 Mason, Ohio, uses 15240 kcs (Nf) at 2240-2245 (also for South America. KCBR2 Delano, California ,moved from 15310 to 15315 kcs (Nf) and carries the AFRS for Alaska and the Aleutians at 0100-0845. KGEI1 Belmont, California,6075 kcs, and Relay Station Munich 2, 6130 kcs, are both now inactive on these channels.

Canada. Station CBRX " The Voice of British Columbia " at Vancouver, 6160 kcs, has been logged with fairly good signals in the U.S.A. around 0515 (URDXC).

Mexico. The call-sign of " Radio Morelia," Morelia, 6030 kcs, is still XEKW and the MW call remains XESF. This station has been heard in Texas with English announcements, according to URDXC (which is contrary to a previous report in the June *Review*.).

Nicaragua. YNBH " Radio Panamericana," Managua, continues to operate on 6549 kcs, and not 6015 as often listed ; the frequency has been checked and measured by two American DXers (URDXC)

Dominican Republic. HI2L " La Voz del Tropico," Ciudad Trujillo, 9525 kcs : logged with weak signals around 0300 in New Zealand with some QRM from OAX4T Lima on 9530 kcs (Ian Hardwick).

El Salvador. YSUA " Radio Mil Cincuenta," San Salvador, is still on 6100 kcs despite reports that it had moved to the old frequency of 6250 kcs (URDXC).

Cuba. John Whitington has been hearing COCW " Radio Habana Cuba, Cadena Roja " on 6322 kcs with good signals around 2345.

Honduras Republic. The 9030 kcs outlet of HRA " La Voz de Lempira " at Tegucigalpa, has been inactive for a while, and is now heard on 9047 kcs (Nf) ; 5920 kcs is in parallel (URDXC). HROW " Radio Monserrat," Tegucigalpa has been noted on 6675 kcs at 2300 onwards with a musical programme and announcements by a YL ; signals Q5 S8 (Whitington).

SOUTH AMERICA

Brazil. A new Brazilian station, " Emissora Continental," is expected to open on 6195 kcs with 1 kW power ; the location will be Niteroi (State of Rio de Janeiro), and transmission times are expected to be 1000-0400. QRA : Avenida Rio Branco 173, 190 andar, Rio de Janeiro (Radio Sweden).

Station PSH Rio de Janeiro was Q5 S9-plus on 10220 kcs with some CW QRM at 2245, announcing as " Agencia Nacional." (Stanley Coppel). This one is also listed by John Simpson on 10210 kcs with music and announcements up to 2300.

Argentina. The English programmes of SIRA, Buenos Aires, are now on the air as follows :—1800-1900 for the British Isles over LRS (11880 kcs) ; 2200-0030 for the U.S.A. over LRA (17720 kcs) ; and at 0400-0600 for the U.S.A. over LRU (15290 kcs). This latest schedule has been sent along by C. R. Johns and Mike O'Sullivan. John Simpson says the 17720 kcs outlet is a beautifully modulated QRM-free signal of terrific strength during the evenings, when hardly anything else except HCJB (17890 kcs) is coming over.

LRT " Radio Independencia," Tucuman, on 11840 kcs can be heard around 2300 (Ron Thorndike).

PUZZLE CORNER

There is an Arabic-speaking station operating on exactly 5000 kcs, which has up till now remained unreported and unidentified. John Simpson has spotted it, however, and describes it as " a consistent performer through the QRM " (We have been hearing since last June, by the way.). To stimulate a little interest, we shall send a free copy of the current edition of *World Radio Handbook* to the first listener who sends along absolute proof of identity, i.e., a verification from the station concerned (QSL's will, of course, be returned.).

The station can be heard during the early evening, and sign-off time has been noted to be any time between 1930 and 2000. In the event of the origin of these signals being made known by another journal, DX Programme, etc., the contest will automatically become void.

CONCLUSION

Newcomers to the Honour Roll should note that we start at 30 countries verified (Shortwave Broadcast Stations only), and it is not necessary to repeat the full list if you already hold a position. Your Broadcast News is always appreciated and should be sent to : J. Fairs, 2a Durham Road, Redcar, Yorkshire, England, to arrive by the 27th October. If a personal reply is needed, please don't forget the SAE !

The Editor and your Scribe thank all readers who sent along items included in these notes, and all contributions are acknowledged.

73 and the Best of DX till next month.

(HONOUR ROLL on page 356)

ON THE HIGHER FREQUENCIES

Monthly Notes and News

by

H. E. SMITH, G6UH

We deeply regret to record that Lieut.-Col. L. N. Stephens, O.B.E., G2BN, passed away after a very short illness on August 22nd.

One of the very old timers, G2BN was specially well known for his phone transmissions on the 2 metre band. Another well known old timer G6QN has written an appreciation of " Steve," as G2BN was affectionately known. G6QN writes " By the death on August 22nd, 1952, of Lt.-Col. Stephens, O.B.E., G2BN, Amateur Radio, and in particular Two Metres suffered a grievous loss. G2BN or " Steve " as he was to us, was one of the real old timers having held a three letter call in pre-1914 days. He once told me that he was present at the very first meeting of the old Wireless Society of London.

Steve's 9 o'clock " Breakfast Club " schedule, which he ran daily for some two years (in fact he ran it up to the day before his short illness) will be missed with great regret by all the 2 metre stations who took part in it.

It did not matter whether anyone or no-one came on for the schedule on any particular morning, G2BN's time signal for 9 a.m. and his cheery voice calling G- -, G- -, and " anyone else who wants to come in " went out daily just the same. Alas we are not to hear his voice again. One of nature's gentlemen, Steve was always ready to be of assistance to any fellow Ham, by reports, constructional work, or on matters outside Amateur Radio. Active almost to the end, it was the writer's privilege to have worked him on what was to be his last QSO, though little was this realised at the time.

Following that QSO came a land-line call from GB2N enquiring after the health of the mother of another Ham. This was typical of this Grand Old Man.

G2BN, your voice is stilled but the memory of you will live on in the hearts of many Amateurs and not the least in those of :— G6QN, G3FSD, G3FSG, G3GSE and G3BVG."

(We can add nothing to the above moving expressions from G6QN, except to offer our condolences to Steve's family in their very sad loss.)

VHF in Ireland

The VHF Research Society of Ireland, with EI2W elected by an overwhelming majority as First President, has now produced its first Bulletin, and a very interesting publication it is.

The Society has 27 GI members and 26 EI's at the time of going to press and there is no doubt that many more will be enrolled as time goes on. The first meeting took place at Clonmel, Co. Tipperary on August 23rd, and it is hoped to arrange the next meeting towards the end of September in Northern Ireland at a venue to be decided upon. EI2W will be pleased to receive details of operating frequency and gear used from as many G stations as possible for inclusion in the Bulletin.

We quote from the " VHF Jottings " in the Bulletin :—

The following are always outstanding signals in this country, G3WW (Cambridge), G6NB (Aylesbury), G201 (Manchester), G2HIF (Berks.), G2HGR (Bolton), and of course G3BLP (Croydon). The latter is one of the outstanding signals in Europe on VHF.

VHF Antenna Coupler. QST for January, 1952, contained assembly details for a very efficient VHF antenna coupler. It should be used at the aerial feed point if possible, with a non resonant 72 ohm feeder to the Transmitter.

EI3L and EI9N of Dublin, both operate on 144.126 (not at the same time wehope. HI).

GM3DIQ is using a 20 element array of the Yagi type. Four 5-element beams in square formation. His signal strength has gone up enormously since erecting this array and he is received at great strength by EI2W.

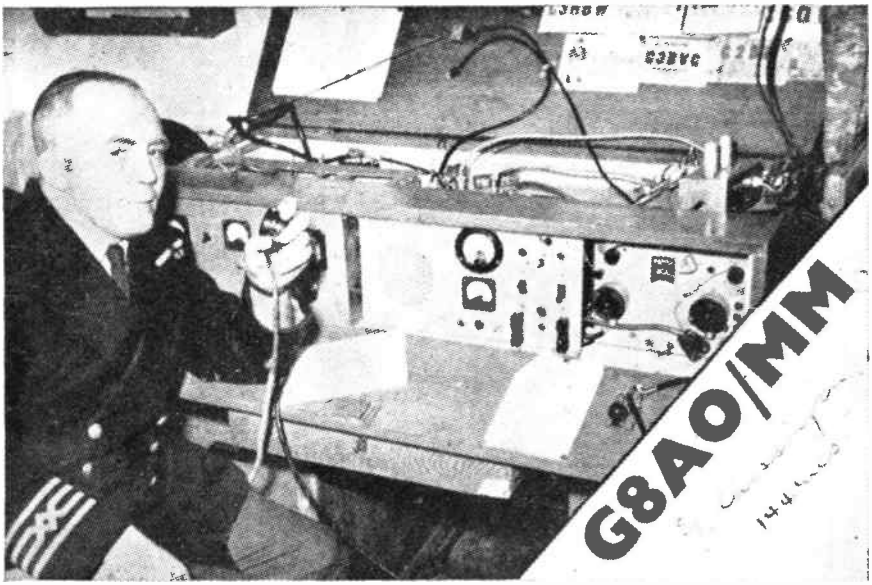
DL3QA the well known German VHF operator (Austin Hasenjager of Alsdorf-Aachen) will be visiting Ireland during the month, and will call with EI2W during his visit to Dublin.

VHF stations in Waterford and Wexford are well placed for a crack at the European DX Record held by G5YV of Leeds. They also have a clear path to the Channel Islands.

Finally, here are a few frequencies of GM stations reprinted from the VHF R.S.I. Bulletin. GM5VG (Glasgow), GM3NG (Carluke), GM3EGW (Dunfermline), all 144.180 Mcs. GM6ZV (Glasgow), GM3FOW (Bearsden), GM3D1Q (Ayrshire), GM6WL (Glasgow), all 144.200 Mcs. GM3ENJ (Dunfermline) 144.250 Mcs. GM3OL (Dumfries) 144.025 Mcs. GM3BDA (Airdrie) 144.460 Mcs.

The following Irish stations will be operating in Zone D in the near future and we will note any other changes in future issues. GI3GQB 145.818 Mcs. GI2FHN 145.800 Mcs. GI3AXD 145.877 Mcs. and EI2W moves to 145.810 Mcs.

We urge all G stations, especially those in the western half of the Country, to co-operate in listening for the boys across the Irish Channel. There is much to be done on the question of VHF propagation problems, and it certainly looks as though the GI's and EI's are really going to town. Good luck to you all over there.



G8AO/MM the first sea going Amateur station licensed in this country. Capt. E. Clarke of the S.S. Chessington *operates on* 144.180 *mcs as G8AO/MM when at sea and G8AO/MA when in port.*

The VHF Newcomer

Several letters have been received this month on the subject of feeder losses, prompted no doubt, by the article written by your conductor in the August issue. There is nothing mysterious in the fact that it is easy to lose so much power in the feeder. One has only to consult the manufacturers attenuation figures of the feeder for the frequency concerned and the answer is easily arrived at. If for instance, the figure is 6dB per 100 ft. at 150 Mcs. (near enough to 145 to make no appreciable difference), the attentuation figure for 50 ft. is 3dB, or *half power*. This by the way, is for a Standing Wave Ratio of *unity*, in other words, an *accurately matched feeder*. You see then how very important it is to obtain a good match to the aerial. This question of matching also applies to the input to the receiver. Standing waves may be set up on any line which is incorrectly terminated, and it is almost as bad to have a mismatch at the receiver end as it is at the aerial. While on this subject of mismatch, we are again stressing the importance of using a " Balun " (unbalance to balance transformer) at the connection to the aerial when co-axial feeder is used. The dipole, whether it be of the folded variety or not, is a balanced aerial, and it is simply asking for trouble to attempt to feed it with unbalanced feeder. Standing waves on co-axial feeder cause a greater percentage of power loss than when present on balanced or spaced feeders, and it is extremely difficult to obtain a good SWR with co-axial unless a balancing device is used. Details of this transformer have been given in this and other journals on several occasions in the past.

" How many turns for a 2 metre inductance?" is a question that is put to us regularly. Well, first of all, what is the size of the former ? ¾" diameter is a good size and is very widely used. Where a dust iron core is used for tuning, 4 turns of No. 16 SWG with each turn spaced 1/16th inch is O.K. for an EC91 GG stage or half a 6J6 (ECC91) used as a mixer. For a push-pull 6J6, 6 turns will be about right provided that the circuit capacitance is kept to absolute minimum (and of course, circuit inductance).

(Short leads *everywhere*, and RF chokes mounted at right angles to the chassis. All this has been dealt with before but there may be some who still do not realise the importance of these apparently trivial details.)

Inductances *may* be used with the special Lighthouse triodes, although unless space is very limited there is no point in it, as these valves are designed for use in co-axial circuits. Remember that the anode to grid capacitance is very low with these valves, therefore the inductance will need to be much larger than for the B7G types. For EF54 valves, the grid coil should not exceed 3 turns as these B9G types have a much higher input capacitance.

The EF54 valve, although not so widely used on 145 Mcs as it was a year or two ago, is capable of excellent results, especially if triode connected and used either as a mixer or as the front portion of a Wallman Cascode converter. While on this subject of converters, there are many who still have trouble in clearing up the ripple and are unable to obtain a T9 note. A 70 volt stabiliser in the oscillator HT supply will nearly always do the trick. For a 300 volt HT supply and a 6J6 as push-pull oscillator, a 10k 2 watt resistor from HT to anodes, another 10k 2 watt from anodes to stabiliser, and the other stab. pin to earth. More for the Newcomer next month.

(Before moving on to the month's news, we wonder whether anyone can be of assistance to a listener who is contemplating starting up on 144. The name is G. H. Tillett of 136 Cherry Tree Lane, Rainham, Essex, and he requires advice on modifying a type RF24 unit for 2 metre operation. If anyone has successfully carried out this mod, please drop him a line with all details. Thanks.)

The Month's Notes and News

Since we started these notes, we have received an up to the minute report from EI2W, giving an account of the first meeting of the VHF Research Society of Ireland, and of the new European VHF Record. As stated earlier in these columns, the meeting took place in Clonmel on August 23rd, and the newly elected President (EI2W) gave a lengthy address and outlined the objects of the Society and future plans regarding meetings in all parts of Ireland. He appealed to members starting on the VHF bands to support the Zone plan, and this was received favourably. Many GI and EI stations are getting crystals and gear on to the HF end (145.800 to 146.000). EI2W built a 16 element stack and a five over five Yagi specially for this meeting. These were built to 435 Mcs (1/3rd scale for 2 metres) and the properties of both antennas were demonstrated to the meeting, the largest Amateur gathering in Ireland for many years. Mr. W. A. Kane, GI3GQB, and Mr. W. G. Dickson GI3BIL, spoke on VHF equipment, particularly gear for receiving. Mr. J. Riley EI2G, spoke on 'VHF Nets,' and his remarks were warmly applauded. The organisation of the meeting was in the capable hands of Mr. Charles McCarthy (EI6G).

EI2W reports that his activities during August and early September were curtailed owing to business QRM. New stations worked recently include, G8GL, G5TH, G4RK G3HAZ, G2FCV and GM3FVX.

On August 29th at 22.21 GMT, EI2W broke the existing European Two Metre record by working DL3VJ/P operating south east of Horn Lippe. EI2W was heard by the German station for a few hours, and his signals were R5 and S6 shortly after 2200 GMT. The following morning a further QSO was effected with EI2W's signals reported R5 S7/8 and the DL's signals were S8 in Dublin. The distance is 655 miles. Both stations were using low power (EI2W 25 watts, DL3VJ/P 15 watts), and both were using a Wallman Cascode converter. The DL was situated 400 metres above sea level and EI2W is 760 ft.

Although there is news of a QSO between a French station and a North African station over a distance of some 680 miles, we understand that both of these stations operated portable, and as it is generally agreed that only contacts from fixed stations can count as records, EI2W can justly claim to hold this Record. Anyway, whether it is officially recognised as a record or not, it is a splendid effort and both stations are to be congratulated on having made the QSO.

EI2W is shortly publishing a 2 metre book and will be pleased to receive details from as many stations as possible by the 31st of October. Details should include, Name and Address, Call Sign, Frequency, RX and TX particulars, Operating times, Height above Sea level, Type of aerial, Photographs (good glossy one) of operator and/or gear, any other data regarding operator-Station achievements, etc.

All such details to be sent to EI2W, "The Limes," Plunkett Avenue, Foxrock, Co. Dublin.

G3CVO, Gerrards Cross, Bucks., has taken down the old stack of four folded dipoles and is using a 4 element Yagi with some improvement, except that it must now be rotated! Tests have also been made on a 3T over 3T Contra rotating stacked vertical helical array giving 360 degree radiation. Reports show that this is nearly as good as the 4 element Yagi. The 70 cms Transmitter is being overhauled by a "man with a lathe and a blowpipe" (G2DD). Experiments are being made with a MO-PA for 70 cms, and Mike considers that this will be as stable as a crystal multiplied by a fantastic number of stages. An 8012 has been tried but trouble was experienced due to heat expanding the lines and melting the wax off the isolating condenser. A CV90 co-axial osc. is now being tried out. G3CVO is anxious to contact anyone who has tried out a MO-PA for this band. As is well known, G3CVO is Secretary of the British Amateur Television Club, and he reports a highly successful show at Dagenham with 17,000 people present. Pictures were obtained all the time from a 5527 Camera and a Telestill unit.

G5LK, Leslie Knight, Reigate, Surrey has been operating on the 2 metre band for several years now, and we think his claim to be the only blind Ham operating on VHF to be correct. Leslie is a very old friend of ours, and we remember well those 5 metre portable days in the 1930's when Leslie used to join in with

great gusto and work like a trojan in getting the station erected. G5LK is most appreciative of the help that has been given to him by other VHF operators, some of whom travelled from such places as Winchester, Wembley and Denham in order to give him some practical assistance.

Leslie is puzzled by the fact that he hears and calls far more stations than he can work, and says, " assuming that the stations I hear and call at over 100 miles have good receivers, is it that 15 watts is insufficient power, or that my aerial, a four element Yagi at 30 ft. is not high enough, or is it that the nearby hills are preventing my signals from going north, while allowing the signals from that direction to be received." (This is indeed a complex subject and we hesitate to pass an opinion. Some of these points were raised in an article by your conductor some months ago, and we suggested then that the Yagi type of aerial has a greater receptivity to a signal arriving at a relatively high angle. When hills intervene, the signal, if from a DX station, is usually coming in at 40 degrees at least, and the Yagi aerial will be nicely receptive to it. If the DX station is using a low angle radiator, he will be unlikely to hear much high angle signal when the conditions are such that reflections are taking place to cause this form of wave distortion. Anyway, perhaps someone else has some ideas on the subject ?) Thanks for dropping us a line Leslie, we shall look forward to hearing from you again. Good luck.

G3MI, Chesham, Bucks., reports conditions as not having been too brilliant during the month, except for a good opening to the Continent on August 29th. ON4HN and ON4BZ were the best signals heard. Everyone seemed to be working DL's but G3MI says that it is his worst direction owing to the hills rising almost off the doorstep to the east. An 8 element stack has been constructed for 70 cms and it is hoped that this will bring in more signals than hitherto. " If only there was some definite time when one could be sure of finding some 70 cms signals it would help a lot " says 'MI, " as it is, I spend half my time becoming infuriated with the band, not knowing whether it is my converter, my aerial, my QTH, or whether there is just nobody on." G3MI says that his 70 cms activity will not interfere with his regular three evenings a week on 2 metres, and sometimes more.

(Thanks for the gen Bob, we only wish that time would allow us to be as active on the band as you are.)

G5YV, Morley, Leeds, finds that activity on 2 metres has deteriorated badly during the past month of two, except during Contest periods, and he wonders where a lot of the old regulars have got to this season. 180 different stations were worked between July 1st and August 31st, in 9 countries and 46 counties. Most of these were worked during Contest times. During the past few weeks a 4 over 4 Yagi has been tried out. This showed a 3.5 dB gain over the 4 element when initially lined up, but this gain has not shown up in practice. In fact the 4 over 4 was somewhat down on the long distance contacts. This has now been dismantled and a 5 element Yagi installed which showed 1dB up on the old 4 element, yet in practice it is 4 or 5 dB up !! G5YV finds that he invariably gets better reports from the Continent when his beam is at the 60 ft. height than when it is at 90 ft. Perhaps some of the propogation experts could find an answer to this one, says G5YV.

He doesn't think or believe for one moment that it is poking its nose above the duct. The nightly sked with G2AJ continues with great success, no matter what the conditions are like, and they are now nearing the 100th QSO since May. There is no doubt that the most reliable signals from the South are those of G2AJ and G8OU. Since G8OU put up his super 24 element stack his signals have become most reliable. G5YV has visited G8OU and says " I have been up his mast and had a good look at the beam. The workmanship is first class and his methods of mounting the elements and crossbracing are unique. How he managed to get it up in the air is a mystery to me. HI."

GW2ADZ, Llanymynech, N. Wales, has had the usual run of stations up to 200 miles with several new stations worked including, G6PJ (Sheffield), G2DUS, G3BEX/P, and G3ANB. Bill deplores the lack of early activity and cannot understand why 99% of the activity is confined to late hours. On 70 cms, good contacts have been made with G2FKZ (S8), and a 70 cms test was carried out with G3HAZ of Birmingham, but the signal that G3HAZ put out went to Bournemouth instead !! Bill thinks that G3HAZ is badly placed to put a signal in his direction, and it would appear that a lot of reflection takes place. The 23rd and 24th of August could have been good days for 70 cms operation, with a Contest on too, but presumably 70 cms activity in the Contest was nil. Stations preparing gear for 70 cms include G2FNW, G6NB, and G4RO.

From September, 1951 to September, 1952 GW2ADZ worked 9 counties, heard 5 others, and was heard in two others, all on 70 cms.

G8IL, Salisbury, Wilts., has recently been suffering from a period of forced inactivity due to a fracture in the feeder at the connection to the beam. This became a positive break in June, and caused a major operation in getting the beam down from the top of the 45 ft. pole. The new arrangement is now completed, with the 45 footer pivoted on a pair of 25ft. poles, and a total beam height of 54 ft. The whole assembly can be swung down with one hand, and for the first time, G8IL is able to experiment with different types of aerials without

serious hold-up to his activity. The additional 9 ft. has made a remarkable difference to signals to and from the North-East, North, and North-West, including the London area. Since starting up again at the beginning of August, 80 stations in 26 Counties and 5 countries have been worked without any special effort. This is quite unprecedented for G8IL. The improvement to the North has been particularly marked—G5YV, never worked previously, has been raised twice, also G5GX and G3MY/P in addition to G8KL, G6YU, G2HCG, G2FNW, G3FHO, G3FFX, G5BM and others only workable previously during exceptional conditions.

Other DX worked includes :—DL6EP, ON4HN, F8BY, F8GH, F9RL, and F9JY. Conditions to DL and ON were outstanding on the 29th of August. DL6EP was being heard in Falmouth at S8.

G6QN, Colliers Wood, S.W.19., has recently put the beam (5 element Yagi) up to 25 ft., and is now hearing much more of the DX although he is as yet unable to raise G2DSW, G3CNF, G2AUS, G6YU, G5YV, and G2IQ. Reg obtained his VHFCC with a 3 element Yagi at 8 ft. from ground, the best QSO's being with G2XC, G2UJ, G2FTS, G3BNC, G3GHO, G3BEX/P, G3FUW, and G5MA/P (Rutland) (A very excellent show indeed OM.)

G6QN thinks that height above sea level is the best DX getter, with plenty of power for makeweight (We could not agree more. A high location plus high power wins a Contest every time (provided it is run on a points system) that is proved again and again.).

G3WW, Wimblington, Cambs., continues to maintain his high activity, and still finds new stations to work. Some of these are G3DVP (Birstall, Lancs.), G3HWF (R.A.F., Yatesly, Wilts.), G3HSN (Northampton), and G3AVO at his new /AQTH at Royston, Cambs. During his holiday G3WW visited G5YV (with G3BK), G2FTS, G3HCK, G3DIV, G2UJ, and G6CI. On the 26th August, 'WW visited the Radio Show at Earls Court (It is to our regret that we missed you for a personal QSO OM). In these reports of G3WW's activity we stress the new contacts he makes, but it must not be taken that he is only interested in working *new* stations. 15 QSO's were had on the 23rd of August and 7 on the 25th, to say nothing of many more on the 29th and 30th. On these latter dates the band was well open, and contacts were made with Norfolk, Suffolk, Warks., Yorks., Durham, Hants., Surrey, and two QSO's with Holland. Later on at 0035, EI2W reported that GI3BIL had been hearing 3WW for hours, but no signals were heard from BIL at Wimblington. Another one way path ? When the DL stations were coming through in Cambridge recently, G4MW and G2XV (together) believed they heard an HA station on Phone. Although he QSL's 100%, the income is so low that G3WW has now decided to QSL G stations only on receipt of their QSL. G3WW also reports on the new record set up by EI2W, which we have dealt with earlier in this Edition.

G3GBO, Denham, Bucks., has raised his total to 289 stations worked, some of the new ones being :—G3HVO/A (Morden, Surrey), G3ASR/A (Edgware Club), G2BM (Stevenage, Herts.), G3CLL (Thames Ditton), G3IEX (Henlow, Beds.), G2UN (Lancing, Sussex), G3DIV, G3HCK (whose QTH's are wellknown), and G3FGB (Wembley, Middx.). The usual run of locals have been worked, and Don has had another QSO with ON4BZ at 589 both ways.

G3GBO has also worked G5YV during the month. A new super lightweight 4 over 4 has been erected using $\frac{1}{8}$" diameter elements, and $\frac{3}{8}$" boom, the whole being mounted on $1\frac{1}{8}$" top section of the mast. This was 47 ft. high at first, but an accident during the final lift made it necessary to reduce the height to 41 ft. This beam has given a great improvement over the old one, and is driven by a small electric motor. Don tells us that he is expecting his call up at any time now, so he may not be so active in the near future (Your signals will be missed OM, and so will your reports. Good luck anyway.).

G2CGF, Hayes, Middx., tells us that he is preparing gear for 2 metre operation and will be on the air as soon as everything is completed.

G3HZK, Hayes, Middx., who operates under very difficult conditions, with indoor aerials, says that he is thinking of returning to a simple dipole again, as this appears to give him better all round results than a dipole plus reflector. John has been too busy to send a proper report this month, but says he is still as active as ever, and will be glad to receive reports on his transmissions.

Listener Section

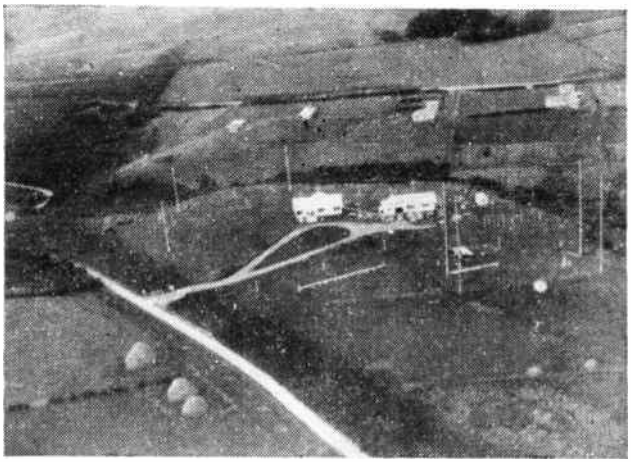
Our listeners do not seem to have been doing much listening this month, but we have received an interesting report from our old friend **Reg Russel of Southampton.** Reg says that August on the whole, was not a good month. The path of the depressions shifted South in no uncertain manner, which meant that the path to the North was closed to him. Only three stations from the North were heard all the month. These were G5ML, G2IQ, and G6YU. On the other hand, signals from East and West were really good at times, even to the extent of hearing London stations on *outside of Contest periods!!* (Who has a guilty look ??) The 28th of August provided the best opening to the Continent for some time. During that evening a warm front was positioned right along the Channel. Although G3FAN was hearing DL6EP as early as 1930 hours, Reg heard nothing unusual until 2150. At this

(*Contd. on p.* 367)

AMATEUR BANDS COMMENTARY

—: by :—

STANLEY
HERBERT
G3ATU



ZL1MP, ex-GW6AA's present QTH, masts at 90 ft. tall and support 14 mcs " 8 over 8 "

We open this month's Commentary with an apology for the very early September " deadline." Numbers of our correspondents, due to holidays and other causes, were late in receiving their " RA " this month and missed the boat, so to speak. The early date was unavoidable, unfortunately, but in future months a later " deadline " is once again possible : specific dates are given later.

Conditions have been uninteresting for most of the time, but Twenty, especially, has as usual produced odd bursts of good stuff.

Of particular interest is the early morning reappearance of signals from VK and ZL. Generally, they are weakish, but should improve as Winter approaches. We can expect also to hear VK from now on during the afternoon period, coming over the short path and consequently rather stronger than in the mornings.

Forty should be showing signs of life any time at all. About this time last year we remember working VP8AP and VP8AO around midnight, but the present situation on 7 mcs is so chaotic that it's more or less a case of " Brother, is it worth it!" Actually, for anyone who can copy CW through interference, the band has tremendous possibilities. We have mentioned VP8 already. For the record, here is a short list of other DX worked in early October, during the last two years. VS7, VP5, VK6, VQ2, ZD4, HK4, VP6, CE and TI2, all round midnight. VK2 and 3, ZS3, 4 and 5, UAO, FQ8, MP4, SU1, from 1600 to 2000. ZL 1, 2, 3 and 4 from 0600 to 0900. It will be interesting to see how things compare this year. We have a sneaking feeling that, at long last, conditions are starting to improve, but as we still can't work tomorrow's DX to-day, we can only wait and see.

Once the Sun-spot cycle does start climbing conditions should improve fairly rapidly, with 21 mcs and 28 mcs, in that order, peaking last, so it seems that we shall have to wait a year or two before Ten becomes reliable for DX. Fourteen, although at present disappointing, is worth watching. One of these days it won't only be good—it will be very good indeed !

Gleanings of the Month. Twenty Metres

We start with a comprehensive CW/Phone melange from C. L. Bradbrook (Alton), whose disappointment at missing VS5ELA and YA3MY is tempered by snagging two all-time new ones—ZK2AA and ZM6AA, the latter on Phone. New ones this year were HE1JZ, 1LAA and HB1JJ (although this one is surely a Swiss portable), heard within forty-eight hours, VS9AW (Oman), all on Phone, plus EQ3TT and ST2HK on the key. Other CW came from EA9BF, FF8GP, KG6ABI, LZ1KAB, UG6KAA, VP8AJ (Grahamland—14008, 1930), VQ2AC, VK, YI2AM, ZD9AA (14032—1850), ZL2 and 4. Phone DX came from CR6AG, CS3AC, EL9A, HC1FG, HI6EC, KH6OR, KJ6AW (14207-0645), KL7 OA4, VK, VS7, YI, ZD4BF, 4AX, ZD9AA (14146-1845), ZS7C (14260-1740). ZM6AA was on 14122 at 0700, at which time YJ1AA was known to be on. Unfortunately, however, he was not heard.

C.L.B's score is now—Phone—only-36Z, 135C ; Phone/CW is up to 37Z, 163 and as this is the first year on CW, the usefulness of the code speaks for itself.

B. J. C. **Brown (Derby)** has also happily been knocking off the new ones to the tune of 2Z, 6C, bringing him up to 32Z, 108C. He sends his first CW list, adding his appreciation of the Top Band Slow Morse and of the help given him by two local Amateurs.

KH6ES, SVØWB, TA3AA, VE3AAZ and 4X4FQ were heard via the BFO, while voice accounted for VS2CY, CP3CB, VS9AW, FP8AQ, PJ2AA and KJ6AW (all new ones) CE3HL, CM9AA, HP3FL, KH6WU, KL7, KP4USA, MI3FS, LU, OA4BC, 4EU, VK6DO, 6MK, VP9AV, VS7, VS9AW and ZL2BE(0700).

B.J.C. remarks that conditions can't really be called poor, as there is usually something interesting going on or about to happen.

V. Doidge (Callington), a newcomer to these columns, uses a two-valve battery receiver, with which, in ten months listening on Twenty Phone, he has collected 27Z, 106C. Recent scalps include AG2AB, CM9AA, EL9A, FF8AP, HP3FL, HZ1AB, KL7, KV4, OA4BC, PJ2AA, PZ1WK, TI2GR, VP5AK, VP6, VQ4 and 5, VS2, VS9AW, YA3VB, ZC6UNJ and 9S4AH.

I. G. W. Glen (Coldingham), has had little time for Radio since joining the R.A.F., but his interest is greater than ever and he gets in as much listening as possible, aided by occasional weekends at home. Ian uses an R1155 and a " 740," with dipoles for Twenty and Forty and a long wire for the LF bands. Conditions have been variable, but CE3HL, EL9A, HK4DT, HZ1MY, IZD, KZ5TP, LU, OX, PJ2AA, SU5EB, TA2, VS1, 2, 7, VQ5DQ, YV3AT and ZS6BW were pulled in.

C. J. Goddard (Warwick) has added a " Hambander " to his equipment. He has also added eight new countries and so is very pleased with life. On CW, he emerged with CR5AD (14050-2150) and OA4AQ (14060-2145), both new ones for him, with CE3HR, 4BX(2200), JY1AJ, KG4AF, KH6ABW, KV4AA, KZ5CS, PJ2AA, SV1SMX (who is on shipboard, incidentally), TA3AA, W7LXL (Utah, 14060-2230), ZB2I and ZS2BC keeping the ball rolling.

Phone was heard from CE2CC, CO2XF, 8MP, HZ1AB, MI3LV, OX, PJ2AD, SU5, TG9AN, TI2OA, VQ4AC, VS9AW, YV5, ZC4, ZP5 and 5A2TS/AM.

C.J.G. queries the position, now that Libya is an Independent Kingdom. He wonders whether the former calls MD1 and MD2 still count as a country. The answer is that MD1 and 2—the old Libya and Tripolitania—count as one country. They are now both 5A, so if you worked or heard MD1, 2, that is one country. 5A is the same country, so naturally you don't count it unless you are short of the MD calls.

R. Goodman (Edgware) wonders about the KA calls which have recently appeared on the bands. Last month, we suggested they may belong to Japanese Nationals, but it appears we were on the wrong track. The KA series has been issued to American Nationals operating in Japan and replaces the former JA call series.

Ron's O-V-O still pulls in the Phone DX.CE2CC, CO2CY, EL9A, FP8AK, 8AQ, HI6EC, KH6ES, 6WN, KJ6AW, KP4, KV4, VK3 and 6, VP5AK, VP6, VP9VV, VS1, 2, 7, VS9AW, VU2CS, KA2US, ZD4 and ZS6BW, helped to boost the score to 35Z, 144C. Gotaways were YJ1AA and ZK2AA.

H. J. Groves (Dunchurch) has had ten days leave, which gave him the opportunity of doing a little listening for the first time in four months. He doesn't think conditions have changed much, but took advantage of some nice openings to pull in Phone from AP2K, FL8MY, KZ5AR, PJ2CB, XE1CO, ZD4BF, CE, HK, KV4, OQ5, VQ5, VU2, VS2, 7, YI, ZC4 and ZP. ZL4FO, too, was an excellent signal at 2200. Two interesting locals were SM5ARA/8 (On a ship, off West Ireland) and DL4SL/AM (In an Air-Sea Rescue aircraft).

P. M. Crawford (Darlington), weighs in with some more impressive DX. On Phone, he bagged KR6IB, FL8MY, W7AHB, ØGKL, VQ4, SU, TA, HZ1SD, ITA, FP8AK, 8AQ, YA3VB, OY2Z, HE9LAA, CE2CC, VP6, PJ5FN, ZS3S, KL7AFR, CR6BW, YI2AM (R.A.F. Radio Club station) and VS2BD. On CW Martin sorted out PJ2CC, KG4AF, VP8AT, FP8AI, ZA3AB(??), HZ1TA, TI2TG, HH3L, HC2SR, EL9A, KV4AA, AP2K, EA9DC and FY7YB. The latter puzzles P.M.C., who finds French Guiana listed as FY8. However, he's quite genuine—what's more, he QSL's !

Martin picked up an unusual one around 14195, signing X9S4AD and believed to be 9S4AD, working from Thailand. When heard, he was working W1MCW, W2BBV and a DL4.

P. Hunt (Ellistown) has disposed of his BC312 and is now using a converter into a 1224B, which pulled in Phone from KT1OU, 5A2, KL7ADB, 7AFR, W5AGB/FM (more about this one, later), HZ1SD, YI2AM, TA2, VP9BE, VS9AW, VS7, EL9A, SU5EB, VE5BR, VQ4ERR and ZE4JW.

D. L. McLean (Yeovil) has a QSL from FL8MY and thus encouraged, he proceeded to dig out EL9A, FF8AR, HC1FG, HE1JJ, 1JZ, 9LAA, four HZ1's, OA4BC, 4O, PJ2, VQ5, VS2CY, 9AW, VU2BH (14130-2245), YI, ZC4RX, 6UNJ, ZD4AX, several ZP's and lots of OD5, VQ4 and other lesser DX.

G3CMH (Yeovil Amateur Radio Club) has been having TV1 trouble (so have we !) and is rebuilding. CW QSO's were made with ZB1BM, FP8AJ (2055—operator, VE3CCK), FP8AK (op—W2BBK) and some W's, while CN8 and ZB2A were worked on Phone.

D. E. Nunn (Hove) seems to have been having his troubles. He refers to the nightmarish conditions and colossal QRM, but he still pulled out a modicum of DX. VS1EC was picked up and was heard to say he would soon be on his way to Sarawak, so keep your ears open for that VS5 call !

Don raised three new ones in FP8AQ, MI3DW and HP3AL and mentions CM9AA, heard at S9, working from Connecticut, U.S.A.

(What in the world goes on ? The only explanation we can think of is that '9AA was on a trip to the States and was working mobile from his car. Anyone throw any light on the subject?

K. B. Ranger (Strood) writes from his holiday QTH at Weston-super-Mare, where he has been listening on a BC receiver, to the accompaniment of vacuum cleaners, electric doorbells and telephones ! Despite this grim set-up, he pulled in FF8AP, OQ5BG, SU, ZP5DC, VP6, ZD4AX, ZE2JA and a new one—9S4AX, which K.B.R. wonders if he should count. Why not, indeed, especially considering the vacuum cleaner !

In the two weeks prior to his departure, Keith's O-V-1 pulled in Phone from 27Z, 86C, bringing the total this year to 34Z, 124C ; good going. The pick of the DX is EL9A, VQ2AB, 5DQ, ZD4AX, ZD9AA, HP, HC, four YI's, VS9AW, YK1AC, AP2N, DU1AL, FI8AC, VU2BH, VS2, YA3VB, KR6ID, JA2HC and bundles of VS7's. At Weston, CT1's were heard calling VK9BW and ZM6AA, but the two DX stations were inaudible on the BC set. If the CT1's were who we think they were, there would be no difficulty whatsoever about hearing *them* at any rate !

Frank Robb, GI6TK (Belfast) has been at it again. He has worked just about all the DX, this time, his best on the key being KR6IN (14084), CR9AF(14100), CR5JB(14120), ZD4AB, VP5BH(Caymans-14050), FP8AJ, ZS7C, KG6GX, HI1CX, ZD2HAH, ZE5JP, ZS8A, F9QV/FC (Corsica), CR5AA, FN8AD, VQ2AT, and, on Phone, OY2Z. All this was worked between 1530 and 2000, with 1730 as about the peak time.

N. C. Smith (Petts Wood) was good enough to rush us his best for the month by telegram. As usual he has produced some rare ones, such as CR9AH, KG6FAB, JY1AJ, ST2HK and VR2CJ on CW. Phone yielded another VR—VR2CG, together with KA2JH, KJ6AW and W5AGB/FM.

Incidentally, the mystery surrounding W5AGB has been cleared up. We got the " gen " from Chas. Mellen, W1FH, who says the /FM means Floating Mobile. The station is on a darned great hunk of ice, drifting slowly towards the North Pole. So Fletcher's Ice Island goes on its way, interesting, rather chilly we imagine, but very definitely not to be added to the countries list !

P. M. White (Williton, Som.) has been able to do only a little listening of late, but found the American path quite good, with very strong and consistent signals coming in from CE2CC. Also heard on Phone were CX2CO, LU, PY, KV4BB, OX3BD, TI2CAF, VE2, VP6, ZP and 5A22. P.M.W. wonders what has happened to the CO/CM boys, who have been missing for two or three months.

J. Whitington (Worthing) has had a good month judging by his list, which mentions CT3AF, FI8AC, FP8AQ, FQ8AD, HE1, HI6EC, KA2OM, KA2US, 2YA, KG6AD, KR6IY, OA4BC, OD5A (a funny one we've heard ourselves) VK6MK, VS2, 9, VU2BH, YI3WH and YS1MS, all on Phone, with EA9AP, KA2OM and KG6FAA on the key.

John was delighted with a visit he paid to G3FXB, from where he was able to say hello to several DX stations. He passes along some info. on matters DX as follows. HC1FG has been heard working VP1AB (British Honduras and mighty rare).

Lou, of W1MCW, gives ZK2AA's frequency as 14180 : she hints, also at possible activity from Crete. In the near future, too. HZ1MY tells of activity on the part of YA3VB. September 5th and 10th were the dates mentioned. '1MY himself is expected to open up from some exotic spot (name not given—very hush-hush) on September 18th to 20th. He will sign HZ1MY on this and future occasions, presumably in an effort to avoid the attentions of the characters we know so well. We think he's being just a little optimistic, in fact we'd lay a small wager that from now on he'll cause an uproar every time he comes on the air !

G3ATU (Roker) has also been having a spell away and so has little to report in the DX line. FB8ZZ came through again one evening at 1630-14059, on the LF end and around the same spot, up came OX3BFX, rather an unusual call but apparently quite genuine. The QTH is Thule and the OX runs 1 kW. W7HYW (Wyoming) was worked (1430-14020), UL7KAA and UI8KAA (Tashkent) were both busily " WSEM 'ing " at 1300 and the odd VK5 can often be heard at the same time. While at the shack of the hospitable OZ2EO, we heard ZD9AA and VP8AJ (Grahamland), both putting in very respectable CW signals. On the Phone side, EA6AT is very active and VK1RG (Macquarrie) is known to be on. Look for him in the early morning and late afternoon, but don't expect an S9 signal.

Fourteen Metres

For the time being, most of the activity on Fourteen seems to take place at weekends. During the week, little or nothing is happening for most of the day, due mostly to lack of activity rather than bad conditions we imagine, as in the evenings there are usually at least one or two signals to be heard.

B. J. C. Brown heard lots of European short-skip and Phones CN8AN, 8CR, 8CS, IS1CYZ, OQ5 and PY.

P. M. Crawford was in on some good openings and heard numerous W's, JY1OG, ZD9AA, KZ5AP, YI, PY6, I1 and ZS6EK.

D. L. McLean weighs in with a brace of OQ5's and tells us that G3CMH has done well on the band, working FF8JC, KP4CC, LU1EP, 1EK, 4DAV, 8NA, PY2, W4COK and YV5AB—all one Saturday evening, 1945-2230.

Other contacts were with ZC4RS, DL2, F, G,

GW. FA8CR, ZS1FD and ZS4FF were called but missed.

N. C. Smith is the only one to mention W6. He heard two of 'em—W6DFY and W6LEE.

J. Whitington, on tuning the CW band, picked up several locals, GI, GM, HB9, LU9AX, W1AW. On Phone, he singled out CN8, OQ5 and considerable numbers of Europeans.

We picked up VS2CR on the key, 579 at 1400.

Other Bands

Most of the interest on the remaining bands centres on Forty, where the keen types have unearthed some good stuff (bearing out our earlier remarks). Poor old Ten continues very much in the doldrums, although even it has had an occasional mad moment.

K. B. Ranger took advantage of one such occasion and was able to swell his Phone log with CR6AD, 6AL, 6BX, CX4CS, OQ5CC, EA8AP, EA9BA, SU1AB, seven LU's, VQ2HN, 2NS, ZS6HR, PY1AGP at S9 plus and four new short-skip countries, EI9A, SM, OK and I1/Trieste.

Keith still suspects that inactivity accounts for much of the silence on the band. As he says, surely if a VQ2 can put in an S8 signal on an otherwise dead band, then others in the same Zone should be audible, if only they'd come on the air.

D. L. McLean furnishes the only other 28 mcs report, having managed to snag four S. Americans—PY's 1AGP, 2JU, 4PQ and 7DT.

N. C. Smith heard two nifty pieces of DX on Forty CW, to wit, KH6ABH and VP8AJ.

Frank, of GI6TK hasn't been wasting his time, either. He has worked VK and ZL on CW, most mornings, despite poorish conditions caused by oft recurring sun-spots. Other very respectable DX worked is YI2AM (7022-2215), KP4CC (2230), ZS7D (7016-2230), ZC4RX (2215) and ZB1HLW (7004-2000).

John Whitington's 7 mcs contribution concerns Phone from S. America. His efforts brought in CO8MP, LU1AAA, 4AA, 7BF, PY1AA, VP5FR and YV5AD.

QSL's received recently were from, GI5UR, GM3BZJ (21 mcs), FL8MY, 4W1MY, HE1JZ, TG9RB and ZP5CF.

Which reminds us that there have been several requests recently for a QSL Column. So if you have received any QSL's of interest in the past few weeks, let us know about them.

The subject of Set Listening Periods is also very much under consideration and we hope to discuss it further, next month.

B. J. C. Brown has Eighty to himself this month. He got OK1GC for a new one and pulled in W1ACR, 2BZD, 2VYH, 4RIQ and 8FRB.

By the time you are reading this, the band should be providing rather more in the way of DX ; at least we hope so !

From Here and There

From Mike of YI2AM we have details of current activity in Iraq. Besides '2AM there is YI2FD (ex-SU1FD), who is on Forty with a 15 watt outfit, YI3WH is on Twenty and his XYL is expecting a call-sign of her own, which she hopes will be YI3YL. YI2AM is very active on Twenty CW and Phone and may also be heard on Forty and 'Eighty. The Twenty metre aerial is a Vee Beam with four waves on each leg. The resulting signal is really something !

VS7MC (ex-ZC2MAC) is in something of a quandary. He returned from Cocos Islands to Ceylon and has only just received his ZC2 licence. The poor chap finds that the ZC2MAC call-sign which he had requested, was unacceptable to the authorities in Singapore (wherethe licence was issued) and he has been officially allotted the call ZC2AB. So to prevent any ambiguity or doubt on the part of stations worked, Mac is having both the calls on his cards, which will shortly be printed !

Hot news from VS2CY, who hints darkly at impending activity from AC4NC. Should this cometo pass there will most surely result the Father and Mother of All Pile-Ups.

Should you be tuning the Twenty Metre Phone band one morning and happen across what sounds like a Moorish Swing Session with vocal accompaniment in full blast, don't worry—it isn't second channel. *We* thought it was, but after ten minutes the nuisance ceased and a well known 3V8 called CQ. What still puzzles us is—was he relaying the stuff, or did he have the whole ensemble, goat-bells and all, in his patio !

DX QTH's

LZ1KAB.	Box 830, Sofia, Bulgaria.
KR6IY.	624 ACW, APO 239, c/o P.M., San Francisco, Cal, U.S.A.
OA4EU.	c/o American Embassy, Lima, Peru.
OD5A.	Box 242, Beyrouth, Lebanon.
SV1SP.	G. N. Zarafis, 10 St. Fanourion Street, Pangrati, Athens, Greece.
VK1BS.	c/o Nurse J. Mills, Prince Henry Hospital, Little Bay, Sydney, Australia.
5A3TK.	Box 372, Tripoli, Libya.

So much, then for this month's news. Conditions should make listening a little easier from now on. Don't forget to keep a watch on the LF bands and please send your findings to arrive by October 6th. For the next two months, the same applies, i.e., November 6th and December 6th. The address is the same—Roker House, South Cliff, Roker, Sunderland.

In the meantime, Good Hunting, DX and 73.

WORKSHOP PRACTICE

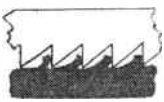
by:— C. H. LAMBORN

HACKSAWS, BLADES AND SAWING

Many amateurs find difficulty in the sawing of metal, making it an awkward operation to perform. In most cases this is due to the lack of knowledge of this particular subject, and if carefully studied no more trouble should be experienced than with any other operation. The usual mistake is to attempt to saw too fast, which eventually results in fatigue or a broken saw. In the case of radio equipment, hand saws only are to be considered, power saws not being necessary and in most cases far too expensive.

Blades

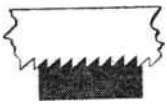
There are many different sizes and types of blades available. These may be obtained in various lengths and with from 8 to 32 teeth per inch. Modern type frames are usually adjustable to take any size blade.



The blades have teeth set to cut in one direction only, on the forward stroke. They may be hard throughout, or of the more flexible type, which have a softer back and hard cutting edge. The following table will give some guidance as to the choice of blade.

Type of metal to be cut	*Number of teeth*
Aluminium or cast iron	14 teeth per inch
Steel	18 ,, ,, ,,
Copper	24 ,, ,, ,,
Tubing or Sheet metal	32 ,, ,, ,,
Strokes per minute ..	40 to 55

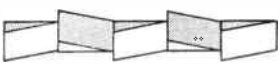
Having marked out the work to be cut, fix it firmly in the vice as near to the jaws as possible, this to avoid any vibration. The weight of the body should be taken evenly and easily on both feet, with the right foot turned outwards, to prevent the body from swaying. Body movement when cutting is practically negligible, the stroke and weight being delivered by the right arm swinging freely from the shoulder, the left arm following and balancing the weight of the saw. Commence with the saw blade slightly inclined to the horizontal, picking up the line at the far edge of the work. Don't try to pick up the



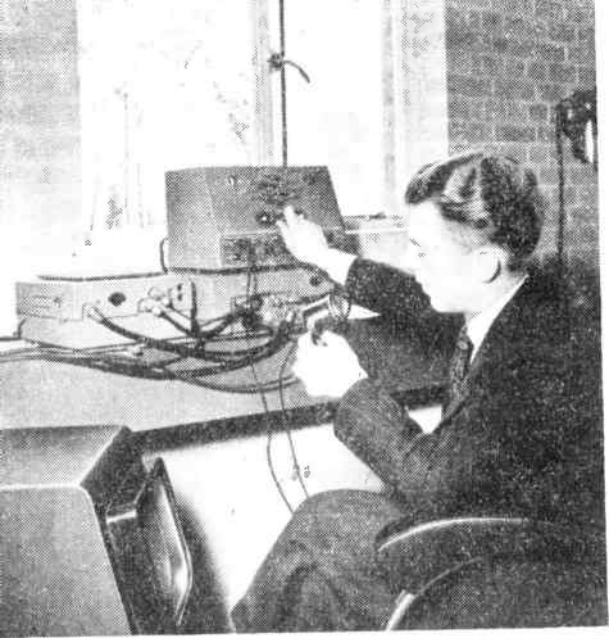
line with the blade in contact with the full width of the work, as this makes the job difficult, and often scars the surface either side of the line. Proceed with light pressure until the cut extends the full length across, gradually bringing the saw blade to the horizontal position. Only sufficient weight should be applied to cause the teeth to bite, this being removed on the return stroke without lifting the saw from the work. Excessive pressure results in a dulled edge, or ultimately a fracture of the blade. Too steeply inclining the blade is also likely to rip off the teeth.

Always remember to choose the right blade for the job in hand. One blade will *not* do all of the work. Too coarse a pitch when used on thin sections or copper tubing will break off the teeth, likewise a 32T used on steel will make hard work of the job, and soon become dull.

Most metals satisfactorily cut dry without lubricant, but when cutting polystyrene it is advisable to use water in plenty, otherwise the heat generated will melt the material and cause the blade to bend in the cut. It will be noticed, if one carefully looks at the teeth, that they are set alternately to the right and left. The



amount of set of the saw teeth determines the clearance allowed for the rest of the blade. Obviously, if the teeth were parallel and there was no set, the blade would bend in its own cut, as is often experienced with a worn-out saw. When fitting a blade, make sure that the teeth point in a forward direction away from handle, and tighten it sufficiently to avoid flexing.



Mullard VHF FM equipment at the Wrotham radio relay repeater station.

V.H.F. F.M. EQUIPMENT

compiled by

By JAMES N. ROE, M.I.R.E., F.R.S.A. (G2VV)

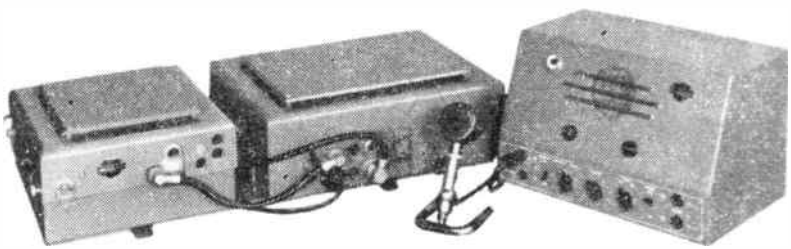
During the recent London-Paris television exchanges it was necessary to maintain radio communication between intermediate relay points for engineering contact, programme cueing etc. over the complete 130 mile circuit.

For this purpose, five 20 watt VHF frequency modulated transmitter/receivers operating on 89.5 Mcs were employed. These were installed at : Cassel, Alembon (near Calais), Swingate (near Dover), Wrotham and London. As a point of interest it was at Cassel that the French 819 lines definition was converted to the B.B.C. 405 lines system.

Similar transmitter/receivers were used in the 1950 cross-channel television experiments and the successful results obtained at that time made them the obvious choice for the more recent programme exchanges.

The equipments are basically the same as the Mullard 20 watt radio-telephone mobile units developed for Police, Fire and Ambulance services. These have provision for spot frequency operation in the 65-100 and 154-187 Mcs bands at a high order of frequency stability.

Special details were necessary for the television link and included a table console unit with additional amplifier stages, over modulation indicator, telephoto facsimile input connections and loudspeaker, for the control of each of the five transmitter receivers. Specially designed aerials included broad-band, ground plane, unipole systems, with vertical quarter wave radiators arranged in cone formation. The equipments were developed by the Equipment Division of Mullard Ltd.



General view of Mullard 20 watt VHF FM station equipment

FROM OUR MAILBAG . . . . . .

Dear OM,

I enclose two cuttings from "Stamp Collecting" because in the DX Countries No. 7 in the July, R.A., it states that no stamps are available at Tristan da Cunha. Stamps as the illustration are now available in value from ½d. to 10s. 6d. They were placed on sale at Tristan on January 1st this year. Previously there were no stamps ; letters were normally delivered in the U.K. *free* of all postal charges.

As many of our readers are stamp collectors, how about a series of articles connecting radio and stamps ?

73's.

C. J. T. Carr,
Ramsgate,
Kent.

Dear OMs,

With reference to the most interesting article on "Reports and QSL Cards," in the August number, I think that the point overlooked in this article and others similar is that reports must be sent to the places where they will be appreciated if a reply is to be obtained. These can be classed as follows :—

1. Real DX stations.
2. Interested amateurs, leaving the 'busy' men who have many contacts alone. They have little time to spare for QSLing.
3. Amateurs in isolated places or 'outposts.'
4. Beginners (forgive the term).

I don't consider sending cards almost ready for returning would help. Forcing people's hands won't help. A keen amateur will usually reply. I received a QSL from Conception (Paraguay) confirming a report sent by me in August 8th, 1951, a week ago. It bore a serial number 2218.

I enclose the card I send. 75% of my cards go through the ISWL Bureau and I am surprised how many replies I get back direct. Incidentally, I find the cards sent via the ISWL reach their destination much quicker than those sent via other bureaus.

73.

J. H. Profit,
Bolton.
ISWL G 4237.

The Editor,
Radio Amateur.

THE QSL PROBLEM

Sir,

As a 100% QSL'er I was very interested in R. L. Kenyon's article. I should like to air my views as an active Amateur station. Personally I think the QSL card is part and parcel of our hobby. It is linked with Amateur Radio not only by sentiment, but by reasons of the fact that it confirms work executed. I have the greatest sympathy and regard for the SW listener who takes the trouble of sending you a report on your signal. Truly, you can say "I didn't ask for it" but have we forgotten our own pre-licence days—do we not consider that the SWL may be the link in our experiments that confirms our new Antenna or PA is working out. We should be big enough in outlook and charitable enough in thought to recognise the effort of the fellow hobbyist who is not so fortunate in having a licence to transmit. I have always welcomed intelligent reports from listeners and have never failed to QSL. Some of these reports are more useful than others, but they all contain the essence of effort.

So far as QSLing between Amateur stations is concerned, I have always kept an open mind on this matter. I respect the fellow who says "Sorry OM I never QSL." This is an honest admission and leaves you in no doubt. Many of my best ham friends have never sent a card. What I do detest is the ham who promises a card and fails to send it. Recently I have ceased working a Well known Two meter station on principle, solely because he lied by saying he had sent a card when he had failed to implement his promise. Even in an important contest I failed to go back and collect valuable points. Had the Station said "Sorry OM, I don't QSL" we should have been very good friends.

May I appeal to my brother hams to give the SWL a fair break—if he deserves your QSL by reason of a good informative report, then let him have it. If the cost is too great, then a little tightening of the belt in other directions will offset the expense. Don't let it be said, to misquote Robert Burns—"hams inhumanity to ham makes countless thousands mourn."

EI2W.

H. L. Wilson,
Foxrock,
Co. Dublin.

CLUB NEWS

Club Secretaries are invited to submit notes for this feature by 6th October, for inclusion in next months issue.

Southend and District Radio Society. GSQK. Hon. Sec.: G. Chapman, B.E.M., 20 Leigh Hill, Leigh-on-Sea, Essex.

The Club station, G5QK/A, was on the air during the International Boy Scouts Jamboree, held at Belchamps, from 9th to 16th August. Also during August, the Club had a visit from the Medway Society.

Coventry Amateur Radio Society. Hon. Sec.: K. Lines, G3FOH, 142 Shorncliffe Road, Coventry.

Attendances at the fortnightly meetings remain good in spite of the holiday season and the winter programme is now being prepared. The Society entered the Low Power Field Day on September 7th, and the Two Metre Field Day on September 21st.

Manchester and District Radio Society. Hon. Sec.: Peter Dean, 31 Park Lane, Whitefield, Lancs.

Meetings are held on the first Monday of the month at the Brunswich Hotel, Piccadilly, Manchester at 7.30 p.m. New members are very welcome and should communicate with the Hon. Secretary.

Kingston and District Amateur Radio Society. Hon. Sec.: R. S. Babbs, B.Sc., G3GVU, 28 Grove Lane, Kingston-upon-Thames.

Recent lectures have covered capacitors, receivers, audia line work, etc. In the near future there will be talk on transformers and also on tape recorders. The AGM takes place on 22nd October when a very satisfactory record will be presented to the members.

Radio theory and morse classes are alternately held on Fridays and ordinary meetings are held fortnightly on Wednesdays at our headquarters, Penryhn House, 5 Penryhn Road, Kingston.
Visitors are always welcome, especially those from abroad who may be visiting the neighbourhood.

Liverpool and District Short Wave Club. G3AHD. Hon. Sec.: Arthur D. H. Looney, 81 Alstonfield Road, Knotty Ash, Liverpool,14.

The Club has just completed another successful year of activity with an increase in membership. A number of visits have been paid to local places of "Ham" interest, the last one being to the Liverpool Airport at Speke where the Radio equipment was explained in detail by our old friend 8JU.

All Members are looking forward to the "Hamfest" in the form of a Hot-Pot to be held on November 7th at the Mecca Cafe-Cotton Exchange. Classes in Morse and also Technical Subjects have been started on meeting nights. We welcome any unattached Ham/SWL to come along and join the District Club in their activity—we meet every Tuesday at 8 p.m. "Meet your fellow Ham/SWL in a happy Club atmosphere." To SWL's, we transmitt on 160 meters every Tuesday at about 21.15 hours, reports are welcomed and QSL'd, reports to the Secretary.

Slade Radio Society. Hon. Sec.: M. D. Fowler, 25, Crossway Lane, Perry Bar, Birmingham, 22B.

An evening DF test was held recently at which members with no experience were given instruction. It is hoped that this will increase interest in the pastime. On October 10th, the lecture will be "Home built Sound Projectors." Venue, Church House, Erdington.

In October, 'Slade' will celebrate its Silver Jubilee and celebrations will be combined with the Midland Amateur Radio Society's Twenty First Birthday programme.

On October 24th, Mr. G. T. Peck of Ernest Turner Electrical Instruments Ltd., will lecture on "The Radio Control of Models." Lecture at the Imperial Hotel, Birmingham.

On October 25th combined Aniversary Dinner, to be held at the Imperial Hotel, Brimingham. This will be attended by the Lord Mayor of Birmingham and the Lady Mayoress.

West Kent Radio Society. Hon. Sec.: F. R. Freeman, G3AXV. 1B Queens Road, Tunbridge Wells, Kent.

The above society meets fortnightly at Culverden House, Culverden Park Road, Tunbridge Wells. A good programme of lectures, demonstrations etc., has been arranged on all subjects apertaining to amateur radio and all interested persons are welcomed. Next meetings are October 1st, 15th and 29th.

Romford and District Amateur Radio Society. Hon. Sec.: Douglas L. Coppendale, G3BNI, 9 Morden Road, Chadwell Heath.

Programme for October :—7th : Junk Sale. 14th : Lecture on Time Bases by Mr. M. Telcs, Ph.D. 21st : Electricity Circuitry, by G3FNL. 28th : Lecture by John Otter, G3BBL.

Purley and District Radio Club. Hon. Sec.: Mr. A. Frost, G3FTQ., 18 Beechwood Avenue, Thornton Heath, Surrey.

At the last meeting on August 22nd G2FKZ C. E. Newton gave a very interesting talk on Tropospheric Propagation in which he described various weather and cloud conditions and their affect on VHF workings. The next meeting on October 23rd will be a Junk Sale and on November 27th H. Knott G3CU will give a talk on Single Side-band.

Meetings are held at the Railway Hotel, Purley at 7.30 p.m. on the fourth Thursday of each month and prospective members and visitors are always welcome.

Clifton Amateur Radio Society. G3GHN. Hon. Sec.: Thomas Arch, 11 Boyson Road, Walworth, London, S.E.17.

On September 7th, the Clifton held its final DF Field Day of the year. This was held as usual at Orpington, Kent. Some 20 members participated in the event, which was won by Mr. Lambert, G3FNZ. The AGM was held on September 12th, when four officers for the year were elected, viz., Hon. Chairman, Hon. Sec., and two Committee members. A very lively discussion followed on the subject of Affiliation to the R.S.G.B. Future programme : October 3rd : Junk Sale. 10th : Radio Theory (Part 1) RAE course. 17th : Query evening. As always the Clifton extends a cordial welcome to prospective members and visitors any Friday evening at the Club Room, New Cross Gate, S.E.14.

Acton, Brentford and Chiswick Amateur Radio Club. Hon. Sec.: Robert G. Hindes, G3IGM, 51 Rusthall Avenue, Bedford Park, Chiswick, W.4.

The Club meets every Tuesday evening at the Aeu Rooms, 66-68 High Road, Chiswick, from 7 p.m. to 10 p.m. There are 32 members on the register about half of whom are licenced. A ' top band ' Tx is nearly completed for the Club, whose call is G3IIU. A welcome is extended to all people in the locality, no matter whether they be old or young, advanced or beginner.

(The Club Secretary writes to say that he recently received a letter from Hector Lee of Oslo Norway, who had read of the Club's activities in this Journal. He wrote to say that he had left some ' junk ' at his old home in London and if the Club cared to call round for it they could have it. It turned out to be first class gear, much of which is to be used in the Club Tx)

SMALL ADVERTISEMENTS

Readers' small advertisements will be accepted at 2d. per word, minimum charge 2s. Trade advertisements will be accepted at 6d. per word, minimum charge 6s. If a Box number is required, an additional charge of 1/- will be made. Terms: Cash with order. All copy must be in hand by the 12th of the month for insertion in the following month's issue.

PRIVATE

WANTED. R107 AC/DC Receiver complete with Instructional Handbook. Good condition essential. Allcroft, 50 Bovill Street, Nottingham.

WANTED URGENTLY. Getting short of cash ? Why not turn some of that surplus gear back into money ? Good prices paid for BC221's, BC312's with or without dynamotors, BC348's. 813's, 726A's, 4E27's, 250TL's and 45OTL's. Apply for prices to Box No. B175.

FOR SALE. 1155F Receiver, modified with P.P. output stage and speaker, perfect. £10 or offer. L. Devenish, 13 Riverside, Hendon, London, N.W.4.

RECEIVERS. Super Skyrider by Hallicrafters, 5 ranges, RF Gain, Band Spread, Xtal, BFO, good working order less speaker, £10 or nearest. 1155 with Power Pack, factory modified, less speaker, £9 or nearest. L. Nixon, 638 Bacup Road, Waterfoot, Rossendale, Lancs.

WANTED. Eddystone 750, 680 or 680X, price. Box No. B211.

WANTED. Telefunken valves of "R.V.12.P." range. Top price paid. Naylor, The Bungalow, Dudley Street, Morecambe, Lancs.

FOR SALE. Eddystone 750, perfect condition, still under guarantee, owner emigrating, £52. Potter, 37 Wykeham Hill, Wembley, Middx.

EXCHANGE. 1949 Mini-Motor in first class condition, only been used about 12 months, for Hallicrafter or Eddystone receiver, cash adjustment considered. Please write—H. Moreton, 9 Wood Avenue, Uplands Estate, Purfleet.

FOR SALE. 2 in. RF ammeter 0-0.5 mA, round, 7/6. Black Crackle metal cabinet 19 in. long, 10 in. back to front, 11 in. deep, with lift up lid. Ideal table top Tx. £2. Rotary 12 v in. 400v 40 mils out. 10/- Vidor personal portable £10. Xtals in GEC holders. 3545 and 3525 kcs £1 each. "East Keal," Romany Road, Oulton Broad, Suffolk.

BACK NUMBERS

Back numbers containing the following constructional articles are available at 1s. 6d. per copy, from A.S.W.P., 57 Maida Vale, W.9.

The Selectoject, by Evert Kaleveld, PAØXE. January, 1952.

Some Ideas on Power Supplies, by J. N. Walker, G5JU. February, 1952.

A High Sensitivity Preamplifier, by J. H. Evans. February and March, 1952.

Crystal Converter for 145 Mcs, by F. W. Hattermore. March, 1952.

Notes on the Design of a VFO, by J. N. Walker. March and April, 1952.

Matching the Aerial to the Receiver, by J. N. Walker. May, 1952.

End-Fire Radiation, by F. C. Judd, G2BCX. June, 1952.

A Simple Receiver Tester, by J. H. Evans. June, 1952.

A VHF Grid Dip Meter, by J. G. Taylor. July, 1952.

The "S-9'er." by Evert Kaleveld, PAØXE. August, 1952.

TRADE

ATTRACTIVE QSL's at reasonable prices, also Club headings, samples. A. Rowe, Printer and Stationer, 101 Fawnbrake Avenue, Herne Hill, London, S.E.24.

METALWORK. All types cabinets, chassis, racks, etc., to your own specifications. Philpott's Metalworks, Ltd. (Dept. R.A.), Chapman Street, Loughborough.

"GLOBE-KING" (Regd.) Miniature Single Valve Receiver gets real DX—Amateur Radio enthusiasts should send for free copy of interesting literature and catalogue (enclose stamp for postage). Write to makers: Johnson (Radio), 46 Friar Street, Worcester.

BOOKBINDING. Volumes of Radio Constructor and Short Wave News fully bound, imitation leather, gold lettering. 7s. 6d. post free. Prices for other publications on application. Jerome Alcock, CHEADLE, Stoke-on-Trent.

HOME CONSTRUCTORS. Radio, television, send for free list of components, valves, kits, speakers, etc. The Radio Equipment Company (RA Dept.), Castor Road, Brixham, Devon.

TV COILS, ALL TYPES. Bell Sound Products Co., Marlborough Yard, London, N.19. ARC 5078.

"PANL"—the air drying black crackle for the amateur, 5s. 6d. per ½ pt. can, from L. Miller, 8 Kenton Park Crescent, Middx.

ANOTHER MILLER EXCLUSIVE. "Motl," the hammer finish, as used on commercial tape recorders, amplifier cases, etc. Grey, Green or Blue. For brush application, air drying. 4s. 6d. inc., or SAE for details. Miller, 8 Kenton Park Crescent, Kenton, Middx.

VIEWMASTER, exact specified parts at list price by return of post, also Valves and CRT's, stamp for list. James H. Martin and Co., Dept. R.A., BCM/EDHWA, London, W.C.1.

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.

REPRINT. Converting the TR1196 Receiver. Full details on converting this unit, which may be purchased quite cheaply, into a very sensitive all-wave receiver. 6d. post free. All the above from A.S.W.P., 57 Maida Vale, London, W.9.

CAR RADIOS, Transreceivers, spares. Different types for disposal. Stamp for details. Brown, 40 Stamshaw Road, Portsmouth, Hants.

JOIN THE ISWL. Over twenty free services to members including QSL Bureau, Translation, Technical and Identification depts. Dx certificates, contests and activities for the SWL together with over seventy local Groups in this country. Monthly magazine "MONITOR," twenty pages plus cover, duplicated, containing articles of general interest to the SWL and League member. Membership 10s. 6d. per annum. ISWL HQ, 123 Sturla Road, Chatham, Kent.

VALVE CLEARANCE, of Salvage Stocks. At 1s. 9d., EA50. At 3s. 9d., 4D1, PEN383, VP133, EB34, 6C5, C2C, LP2. At 5s. 9d., 6J5, 6J7, 12SK7, OZ4, SP2, UF41, UY41, U404, 9D2. At 6s. 9d., 1LD5, 1LN5, 7B7, 7C6, 7H7, 7S7, 6N7, 6L7, ECC31, EF92, EM34, EF50, 210VPT, EB91, PEN220A, SP41. At 8s. 9d., 1S5, 1A5, 3A4, 1R5, 1T4, 1A3, 3S4, 10F1, ECH35, EF54, W17, 5Z4, EL91, 5V4, EF36, EF91, 8D3, 6AM6, 6F12, 6F15, 6LD20, ECL80, 6AM5, 6F6, 6K7, DL93, EF39, KTZ63, ECC35, SP4. At 10s. 9d., 6V6, 6X5, X66, VMS4. At 11s. 9d., EY51, SU61, ECL80, 6AB8, EF80, 807. Send stamps for further lists please. Orders despatched strict rotation—Stock limited. Duke's, 621 Romford Road, London, E.12. Phone : GRAngewood 6677.

Published by Amalgamated Short Wave Press Ltd., 57 Maida Vale, Paddington, W.9 and Printed by Hanbury, Tomsett & Co., Ltd., Kensal Rise, N.W.10