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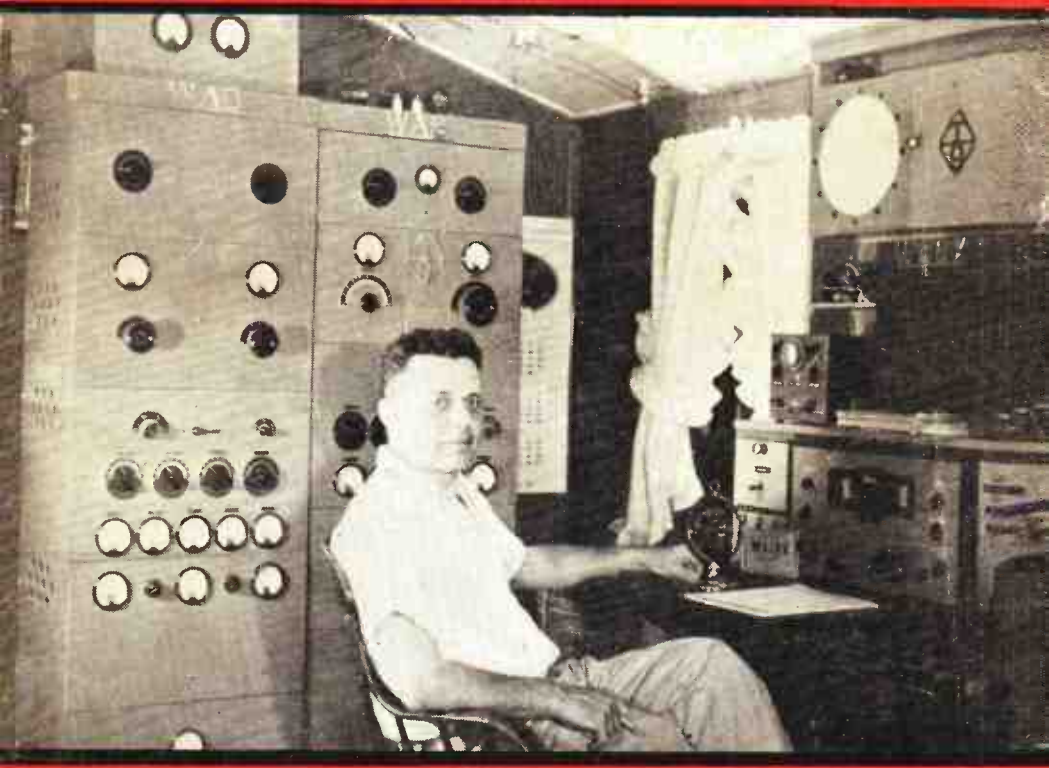
1952

The RADIO AMATEUR

incorporating "Short Wave News"



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OUR FRONT COVER

Our cover photo this month is of W1ISX's station. On the left is a 300 watt, CW rig for 80-40-20, using 808's in push-pull in the final. Next to that is a 250 watt 10 metre 'phone rig with HY51s in push-pull in the final. The receiver is an HQ129X.

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Vol. 7 No. 8
September

incorporating "SHORT WAVE NEWS"

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

Tel. CUN. 6518

EDITOR: Arthur C. Gee. G2UK.

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EDITORIAL.

AT LAST — A PRICE REDUCTION!

Thanks to a variety of reasons, we are able this month to announce a reduction in price of this magazine, commencing with the October number. There will be no reduction in page size or number of pages, and the present standard of contents will be maintained. The increase in price was made necessary by increased paper costs and printers' charges and at the time we said we hoped it would not be long before we could bring the price down again. Thanks to a recent reduction in the cost of production, we are now able to fulfil this promise.

During recent months the magazine has been making very steady progress. Its popularity has increased and we feel sure this price reduction will make it even more popular. We have always tried with all *Amalgamated Short Wave Press* publications to give our readers as great a value for their money as we can and this price reduction is practical proof of this policy. Subscription rates are reduced forthwith to 18/- per annum or 9/- for six issues, and, in addition, subscribers who paid at the old rates will have the period of their subscriptions extended.

Once again, may we ask readers to pass the word around that we are now selling at 1/6. The " winter season " begins to gather momentum by October and we hope during the coming winter months to really go ahead, making still further progress with our aim to produce an unbiased, independent, scientifically accurate magazine for the radio amateur. —2UK.

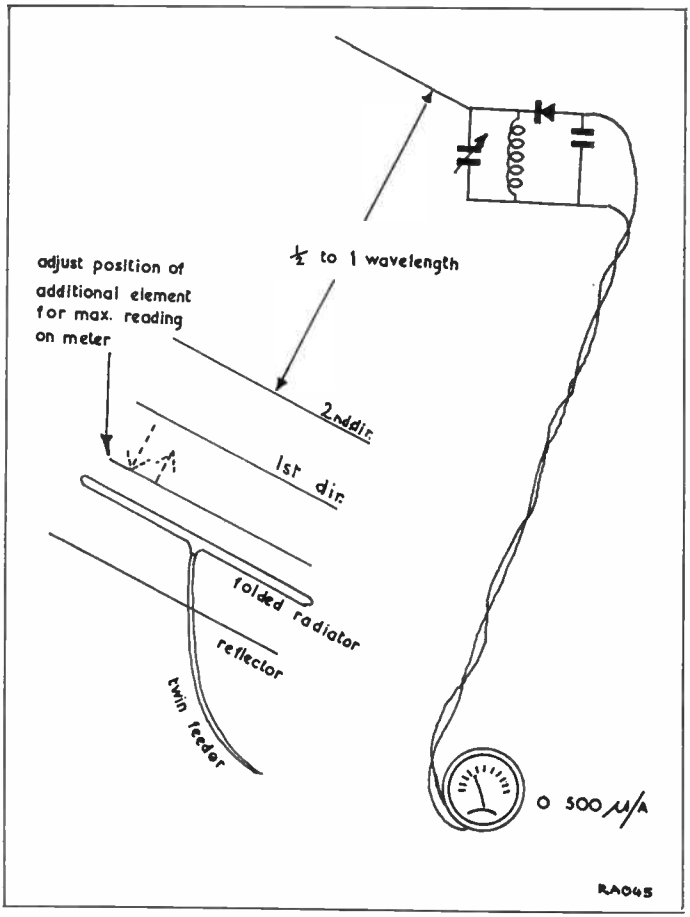
THE EDITOR invites origina contributions on short wave radio subjects. All material used will be paid for. Articles should be clearly written, preferably typewritten, and photographs should be clear and sharp. Diagrams need not be large or perfectly drawn, as our draughtsmen will redraw in most cases,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



SIMPLIFIED FEEDER MATCHING to YAGI AERIALS

by

" AETHERIUM "

THE multi-element Yagi Beam often presents a problem to the builder in the way of arriving at the correct impedance it will present to the feeder. Textbooks offer an approximate guide to this problem by publishing tables and various instructions relating to the folding of the fed element in order to increase the radiation resistance.

The instructions given are usually good enough to enable results to be obtained, but for maximum results the Amateur must always make some further adjustments to compensate for the effect on the impedance caused by the immediate surroundings at the QTH.

Close-spaced Beams of the 4 and 5-element types may present an impedance of anything between 10 and 30 ohms, in fact, with the very close spacing of 0.1 wavelength, the impedance may be in the order of 5 ohms or less. To match a feeder of the 80 ohm type to such an aerial, it is necessary to fold the driven element with a high ratio in diameter between the two elements. It will be seen that a slight error in calculating the original impedance will result in this being magnified to an alarming extent on the completed job.

Take an example : the impedance has been calculated to be 15 ohms. We wish to use 80 ohm feeder so our transformation ratio requires to be just over 5 : 1. From the tables in our handbook, we find the ratios between the elements and make up the folded section. This may easily be in error by 20%, and so may our original estimate of 15 ohms for the radiator. Therefore, we are connecting our 80 ohm feeder to an aerial system which may have a radiation resistance of anything between 60 and 110 ohms. We might have made a blind guess in the first place instead of going to all that trouble !

What, then, are we going to do now ? Is there a simple method of avoiding this business of changing the folded section again

and again in order to find the lowest SWR? There is an excellent method, often used commercially, but seldom, if ever, mentioned in amateur handbooks. All that is required is an additional parasitic element of exactly the same length as the radiator, and some kind of field strength meter. This latter item need only be a microammeter and crystal rectifier with the usual tuned circuit for frequency in use.

The procedure is as follows: Make up the Beam to the instructions given in your handbook. Connect the feeder, and mount the Beam on a pair of steps or somewhere convenient within reach, as high as possible. Connect to the transmitter and switch on at reduced power. Connect a short length of wire to the field meter to act as an aerial, and tune for maximum reading on the meter (it is better to have the meter itself fitted with a long extension flex and brought back to a convenient point where it can easily be seen while making the adjustments with the additional element.) Note the reading on the meter and while holding the extra element in the exact centre (voltage node point) place it in front of the radiator, i.e. between the radiator and the first director. At some point between the two elements there will be a sudden change in the meter reading, and the pointer will probably go off scale. This is the point where the additional element will have to be fixed permanently. Make certain that body capacity is not affecting the meter reading, by fixing the element temporarily and standing clear of the beam. Whether your matching error is on the low side or the high side, this arrangement will work quite satisfactorily and will add a considerable amount of efficiency to your aerial system.

For the non-transmitting amateur, the adjustment is just as easy, provided you can enlist the aid of a transmitting amateur to provide a steady carrier while you make the adjustments watching the results on an output meter fitted with extension leads. Never make the adjustment on a signal outside the frequency for which the beam is designed. For example, do not attempt to match a 28 Mc/s beam using the carrier of a broadcast station operating on 26 Mc/s. By doing this you make the beam inefficient on 28 Mc/s by trying to force it to operate as a wide band affair.

(*Note.*—It may be said that carrying out these adjustments at a lower level than the normal operating height of the beam, will cause some change when the beam is erected at its proper height. This is quite true of course, but the change in impedance is negligible, and the increase in SWR so small that it cannot be measured.)

THE DESIGN OF MAINS TRANSFORMERS

Part 2. **by W. E. THOMPSON**

Size of Core.

Stalloy, the commonest material for mains transformer core laminations, is generally worked at a flux density of some 65,000 to 80,000 lines per sq. in. A good average figure is 75,000 lines, and at this flux density the optimum core size can be found from a simple formula, $A = 0.16\sqrt{Wp}$, where A = area of core centre limb in sq in, and Wp = primary watts. This figure contains a small allowance factor to take care of a slight loss of actual iron in the total cross-section, due to the paper or varnish insulation on the stampings and the inability to clamp laminations tightly together when stacking them in the coil.

Wherever possible, it is better to make the core of square cross-section, or nearly so. Theoretically, this produces a transformer of better efficiency than one with a core section which is not square, but one is not precluded from employing a rectangular core if necessary. Since transformer design is often a question of intelligent compromise, the actual core section may be dictated on physical dimensions rather than on pure theoretical requirements. For instance, if calculations show that a core of 1.0 sq in cross-section is needed, it is obvious that a square stack 1.0 in. thick of laminations whose centre limb is 1.0 in. wide is the ideal, so far as core shape is concerned. But it may so happen that the designer has not any stampings like that, but has some with a centre limb width of $\frac{7}{8}$ in. Must he disregard these, and procure some of the "ideal" size? Of course not; he can use a bit of arithmetic and find that he can make do with those he has. The stack will be $\frac{1.0}{0.875} = 1.15$ in. thick, or a little more than $1\frac{1}{8}$ in. The shape is very nearly square, and the transformer certainly won't raise objection! There is, just the same, a limit to which we can go; a rectangular shape is all right until the stack becomes twice the width of the centre limb. Beyond this, the efficiency of the iron circuit suffers, and we also find there are difficulties in winding. A square-section coil is quite easy

to wind, but when there are long sides to the bobbin it is far from easy trying to keep the winding regular and even.

Turns per volt.

The next question to arise is, how many turns of wire must be provided for each coil. When AC is applied to a transformer primary, the voltage developed across the secondary depends upon : (*a*) the frequency of the applied AC ; (*b*) the shape of its wave-form ; (*c*) the flux density in the core ; (*d*) the core area ; and (*e*) the turns ratio. We can see that for (*a*) the frequency is 50 c/s, which is the standard for AC mains in this country ; similarly (*b*) is sinusoidal. As we have decided on a flux density of 75,000 lines per sq in, (*c*) is taken care of, and by applying the formula $A = 0.16\sqrt{Wp}$ the figure for (*d*) is given. The turns ratio (*e*) is a function of the turns per volt, which we will now seek to define. Application of another simple formula will give :

$$T = \frac{10^8}{4 \times F \times f \times A \times B}$$

where T = turns per volt.
F = form factor of wave-form (= 1.11 for a sine wave).
f = supply frequency in c/s.
A = core area in sq in.
B = flux density in lines per sq in.

For any transformer we are likely to need, it is clear that with the exception of T and A, the factors in this formula are constants, so we can reduce it to simpler terms :

$$T = \frac{10^8}{4 \times 1.11 \times 50 \times A \times 75{,}000} = \frac{6}{A} \text{ approx.}$$

This value is applicable only to the ordinary mains transformer ; it would not be suitable if one of the assumed constants were different, as, for instance, a transformer for use with a vibrator, where the wave-form is square-topped, and the value for F is some figure other than 1.11.

Turns for Windings.

By inserting the value for A in the formula $T = \frac{6}{A}$ we arrive at the turns per volt, or the number of turns of wire we must wind for every volt applied to, or developed across, each winding on the transformer. As an example, suppose the primary is designed for 230V, and there are two secondaries—one for 250-0-250V HT and the other for 4.0V heater supply. (We can neglect the current rating at this stage.) The HT winding here is for a full-wave rectifier so each half of the winding must supply 250V ; consequently, the whole winding is actually designed as a 500V winding with a centre tap. Suppose the value for T works out to 5.2 turns per volt, then :

Primary =
230 × 5.2 = 1,196 turns.
HT Secondary =
500 × 5.2 = 2,600 turns, centre-tapped.
Heater Secondary =
4 × 5.2 = 20.8, say 21 turns.

This forms the basis for design of the windings ; the figure will have to be modified later when copper losses are considered.

Wire Sizes.

As stated earlier, the size of wire is dependent upon the current to be carried. For small transformers designed for continuous rating we can safely use a figure of 2,000 amps per sq in. for current density. This assumes that a wire of 1.0 sq in. cross-sectional area would carry 2,000 amps continuously without becoming unduly heated ; by the same token, a wire whose area is 0.001 sq in. could carry 2.0 amps continuously. The figure of 2,000 amps per sq in. is a useful average value and one which will apply in the majority of cases. If copper losses must be small, one uses a lower current density, say 1,000 amps per sq in, and if the transformer runs only intermittently and copper losses are less important, the current density can be correspondingly increased. In order that a ready reference is available for such instances, the wire tables accompanying this article show current ratings for densities ranging from 1,000 to 4,000 amps per sq in.

It will generally be found that the even-sized gauges can be adopted for most windings. Although the odd-sized gauges are not so popular they are fairly easily obtained, and their use is often desirable where winding space would not allow the use of a slightly thicker wire of even gauge. Readers will, no doubt, notice that Messrs. Electronic Precision Equipment mention odd-sized wire gauges in their "Elpreq Pages" which appear in the "Radio Constructor." Messrs. M. Watts & Co. are also able to supply certain wires of odd gauge. A further source of supply from which quite a wide range of sizes and coverings can be bought, is L. C. Northall, 16, Holly Road, Quinton, Birmingham, 32. In all cases the prices charged are quite reasonable.

Enamelled wire is, of course, the most commonly used material, and if the layers are interleaved with paper the insulation invariably proves to be adequate. There is a special sort of enamel covering known as Lewmax which is particularly tough and capable of withstanding higher voltages, and its use is recommended for general purposes. For high-voltage windings, the silk and enamel-silk coverings are preferable to

(*Contd. on p.* 347)

SWG	Diam. in.	Ohms per yard	Yards per Pound	Amps per sq. in. cross section					Turns per linear inch						
				1000	1500	2000	3000	4000	Enam.	SSC	DSC	SCC	DCC	E & SS	E & SC
10	.1280	.0019	6.7	12.8	19.2	25.6	38.4	51.2	7.0	7.2	7.0	7.0	6.7		
11	.1160	.0023	8.2	10.1	15.15	20.2	30.3	40.4	7.8	7.9	7.9	7.6	7.2		
12	.1040	.0028	10.2	8.5	12.75	17.0	25.5	34.0	8.7	8.9	8.7	8.4	8.0		8.2
13	.0920	.0036	13.0	6.7	10.05	13.4	20.1	26.8	9.4	10.0	9.8	9.4	8.9		9.3
14	.0800	.0048	17.2	5.0	7.5	10.0	15.0	20.0	11.0	11.5	11.0	10.7	10.0		10.3
15	.0720	.0059	21.2	4.1	6.15	8.2	12.3	16.4	12.5	12.6	12.5	11.9	11.0		11.3
16	.0640	.0075	26.0	3.2	4.8	6.4	9.6	12.8	14	14	14	13	12.4	13.5	12.8
17	.0560	.0097	35.0	2.5	3.75	5.0	7.5	10.0	16	16	16	15	14	15.5	14.4
18	.0480	.0133	47.7	1.8	2.7	3.6	5.4	7.2	19	19	19	17	16	18	16.4
19	.0400	.0191	68.7	1.26	1.89	2.52	3.78	5.04	22	22	22	20	19	21	19
20	.0360	.0236	85.0	1.02	1.53	2.04	3.06	4.08	25	25	24	22	20	23	21
21	.0320	.0299	108	.8	1.2	1.6	2.4	3.2	28	28	27	25	22	26	23
22	.0280	.0390	141	.62	.93	1.24	1.86	2.48	31	32	30	28	24	29	25
23	.0240	.0531	192	.45	.675	.9	1.35	1.8	36	37	35	32	28	33	29
24	.0220	.0632	228	.38	.57	.76	1.14	1.52	39	40	37	34	30	37	32
25	.0200	.0764	275	.314	.471	.628	.942	1.356	43	44	41	37	32	41	35
26	.0180	.0944	340	.254	.381	.508	.762	1.016	48	48	45	40	34	45	38
27	.0164	.1137	410	.212	.318	.424	.636	.848	53	53	49	43	36	48	42
28	.0148	.1396	503	.172	.258	.344	.516	.688	58	58	54	47	38	53	45
29	.0136	.1653	596	.145	.2175	.29	.435	.58	63	63	58	50	40	58	48
30	.0124	.1990	717	.121	.1815	.242	.363	.484	68	68	63	53	42	63	51
31	.0116	.2272	820	.106	.159	.212	.318	.424	73	73	67	55	44	68	53
32	.0108	.2621	943	.092	.138	.184	.276	.368	77	77	71	60	46	72	55
33	.0100	.3057	1110	.079	.1185	.158	.237	.316	85	84	75	63	48	77	58
34	.0092	.3612	1300	.067	.1005	.134	.201	.268	93	90	81	67	51	84	63
35	.0084	.4332	1556	.056	.084	.112	.168	.224	101	96	87	76	55	89	70
36	.0076	.5292	1903	.045	.0675	.09	.135	.18	110	105	94	82	58	97	75
37	.0068	.6611	2380	.036	.054	.072	.108	.144	122	115	102	87	62	106	
38	.0060	.8491	3056	.028	.042	.056	.084	.112	135	127	111	95	64	118	
39	.0052	1.131	4066	.021	.0315	.042	.063	.084	159	143	123	103	69	133	
40	.0048	1.327	4766	.018	.027	.036	.054	.072	169	152	129	107	71	140	
41	.0044	1.579	5700	.0152	.0228	.0304	.0456	.0608	186	163	143			150	
42	.0040	1.911	6866	.0126	.0189	.2052	.0378	.0504	201	181	154			159	
43	.0036	2.359	7500	.0102	.0153	.0204	.0306	.0408	222	195	165			176	
44	.0032	2.985	10766	.008	.012	.016	.024	.032	242	213	175			191	
45	.0028	3.900	14070	.0062	.0093	.0124	.0186	.0248	276	233	192			208	
46	.0024	5.307	19120	.0045	.0067	.009	.0134	.018	326	256	201			232	
47	.0020	7.642	27270	.003	.0045	.006	.009	.012	399	287	224			263	
48	.0016	11.94	42860	.002	.003	.004	.006	.008	488		260				

A NEW ZEALAND DX'ER

Arthur T. Cushen

Compiled by JACK FAIRS

ONE of the best-known Dx-ers in New Zealand is Arthur T. Cushen, of Invercargill, sub-editor of *The New Zealand Dx Times*. Arthur gained much of his present enthusiasm by means of a 5-valve set; in 1939 he acquired an 8-valver of English manufacture, and in addition to the latter has, during the past two years or so, been using an Ecko-Marsh 11-valve Rx. The aerial used is of the Beveridge type, and actually runs across a city block; reception in Invercargill is usually very good, especially, as Arthur says, "when the trams go off."

For the monthly "Radio New Zealand" feature, "This Radio Age," an interview by Cleve Costello was recorded at Station 4YZ, and was duly presented to Australian and Islands listeners. This interview was again rebroadcast two or three weeks later by "Radio Australia" in the programme "Australian Dx-ers Calling."

Asked if his listening interest extended to both standard broadcast and shortwave bands, Arthur disclosed that since 1937 he had collected about 2,300 verifications of reception, 879 of which came from medium-wave broadcasters. This figure has since been increased to 893, and the bulk of the medium-wave QSLs are from the North American continent, including 100 Californian stations.

"If the 'best' stations are those on the lowest power," he said, "then my best have been the Voice of the Eighth Army at Bari with 50 watts output; VUX in India (50 watts); and WVTC, a 50-watt American Forces station in New Guinea. Actually, the lowest-powered Broadcast station I have logged was 5AL in Alice Springs, which was operating with 30 watts at the time. My report was the first received from outside the town, and they were quite pleased to have it."

Arthur considers his best shortwave QSLs to be those of CKFX Vancouver, with a power of only 10 watts; and a Bucharest transmitter running 75 watts. The total SW verifications add up to just over 1,400, from 127 different countries, and many readers will, no doubt, remember that Arthur gained first place in the SWL Contests sponsored by the International Short Wave League and the *World Radio Handbook* of Denmark, for the past two years in succession. He admits a liking for the South American stations, as "they are mostly on low power, on the low frequencies, and their programmes are very interesting."

To the question, "How do Dx-ers assist the Broadcasters?" Arthur cited the new Far Eastern transmission of "Radio Sweden," which, being heard in New Zealand at 1 a.m., cannot gain a great audience. Suggestions as to the timing of such programmes and interference experienced were always appreciated by the stations, he said. At least once a week, as an observer for the BBC, he sends a cable to London giving details of reception in New Zealand of the General Overseas Service and the Pacific Service, and, on special occasions, is called on for a cable covering events such as Royal speeches.

Dx-ing has given him other interests, too. Finding out where stations are located has brought about a better knowledge of geography, and, of course, philately goes hand in hand, as stamps come in from all parts of the world. (We believe many other SWLs will agree with Arthur on these points.) Apart from being sub-editor of *The New Zealand Dx Times*, he prepares log charts for various radio manufacturers, helps edit his club's annual call-book, and keeps up a news service

(*Contd. on p.* 318)

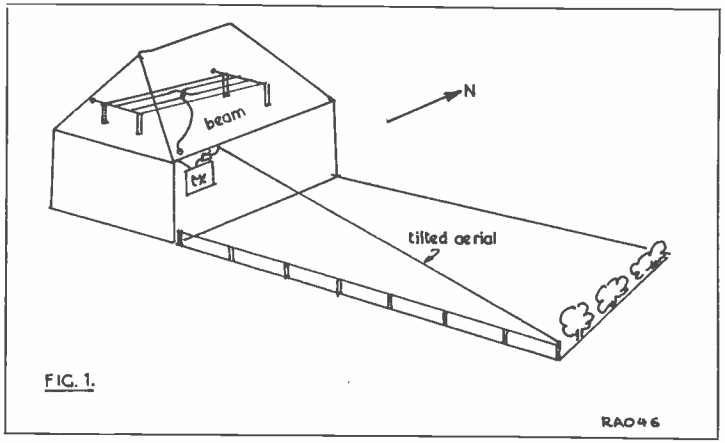


FIG. 1.

RAO46

UTILITY AERIAL FARM

by

ANGUS D. TAYLOR

G8PG

WITH the general shortage of living accommodation, plus the operations of the Town and Country Planning Act, many amateurs at the present time face real difficulties in the erection of suitable aerial systems, especially where operation on the Dx bands is a major interest. While the standard textbooks give excellent data on the more conventional aerial systems, very little is done to help the man with the difficult location, who is left either to shift for himself or to search through the radio periodicals in the hope of finding some information published by a fellow sufferer. It is to help the amateur in this position, therefore, that the present article has been written, as the writer has faced and overcome the problems of a difficult location and now feels that his results on 14 Mc/s can stand comparison with those of the man who has space and aerial masts available.

Briefly, the problem faced by the writer was that of obtaining good Dx results on 14 Mc/s from a house where the erection of masts was absolutely forbidden and even the simplest outdoor aerial had to be located in such a way that it was virtually invisible. To add to the problem, the garden, though sixty feet long, ran East and West. Careful thought was given to the problem, and as a first move the writer dug out a ladder and ascended into the loft to survey the possibilities of using the space under the roof. A little work with the tape measure produced some very satisfactory results—the loft offered a clear space 27 feet long and 7 feet wide, running within ten degrees of a north-south line. Plenty of room, in fact, to erect an efficient two-element beam provided the last three feet or so of each end of the elements was folded. Having found that a beam was possible, the next thing was to decide in which direction it was to fire—east or west? When deciding this problem in a difficult location, only one criterion should be considered. That is, which direction will give the greatest number of Dx contacts during the operating time available? Obviously, the westerly direction was the better in this case, and it was decided to position the beam accordingly, the Great Circle map indicating that the centre of the radiation lobe would pass through Barbados, and that coverage should be obtained over the whole of North America and the northern part of South America.

For the beam itself, it was decided to use a folded dipole director and folded dipole radiator, driven 135 degrees out of phase. This type of beam gives an exceptionally good forward gain, together with good low angle radiation. The elements were made from 14 SWG wire and the whole system was fed via 80 ohm co-axial cable brought up through a hole in the ceiling of the shack. Erection proved very simple, the elements being suspended from cords stretched tightly between the roof beams. One word of warning, however. See that the various elements are cut to length and the insulators and spacers attached BEFORE taking them into the loft, as the roof space is no place for this kind of operation! Once erected, the beam gave excellent service and has continued to do so, the results being outlined in a later paragraph.

After some months of operation with the beam, the writer began to feel that radiation in one major direction was rather a limitation, and started to consider the possibility of getting a signal out in an eastward direction. Various types of beam giving switchable directivity were examined and found impracticable in the space available, so it was eventually decided to move outside and erect the aerial in the garden. To do this,

two techniques were combined—those of the "invisible" aerial and the tilted aerial. For the uninitiated, the following explanation of these two terms is given. The normal transmitting aerial, comprising masts, pyrex insulators and 14 SWG radiator may be a thing of beauty to the Ham, but it is also very striking to the eye of the neighbours and the minions of the Local Authority. If, on the other hand, the gauge of the wire is reduced, the insulators replaced with small pieces of perspex and the masts dispensed with, the aerial fades into the landscape and becomes literally invisible at a distance of a few yards. With a normal horizontal aerial, radiation in a line parallel to the direction of the wire is very small unless the aerial is many wavelengths long. If one end of the aerial be lowered, however, making it tilted instead of horizontal, the radiation becomes concentrated in the direction of the low end and very little radiation takes place from the high end. Thus, an aerial running east to west and normally giving little or no radiation in these directions when horizontal, can be made to fire either east or west by lowering the appropriate end. In the writer's case, the two techniques were combined by making the aerial from 67 ft of 18 SWG enamelled copper wire, as a compromise between efficiency and invisibility, and supporting it under the eaves of the house at the westerly end and on the garden fence at the easterly end, small strips of perspex being used as insulators in each case. The height is about 20 ft at the house end and 3 ft at the fence end. A convenient ventilator at the house end allows end-feed to the aerial coupler in the shack. Very good radiation off the end is obtained, the pattern being approximately heart-shaped. This pattern is illustrated in Fig. 2, the layout of the aerials being shown in Fig. 1.

The results from both aerials have more than lived up to expectations. Over a 15-month period, the beam has given CW contacts with all W districts except WO, VE1, 2, 3, 5, VO, CO, CT3, CX, EA8, KG4, KP4, KV4, PY, TI, VP4, VP6, VP9 and YS, the reports being very good and the beam showing up especially well during spells of poor conditions.

The tilted aerial has only been in use for six months, but has already shown it's capabilities on eastern Dx, contact having been made with 4X4, SU, VS2, VS6, VK, VU and YI, despite the fact that the writer is rarely able to operate at the times when the band is open for Asia. All the contacts outlined above were made with a single 807 running at 50 watts or less.

Though no serious attempt has been made at Dx work, the tilted aerial has been found to radiate a very hefty signal to Eastern Europe on 7 Mc/s, and also to function well on 3.5 Mc/s. On this latter band the beam will also put out a reasonable signal if the ends of the co-axial feeder are shorted and worked against ground.

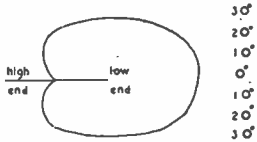


FIG. 2

RA047

Approximate polar diagram of a tilted full-wave aerial. Good low angle radiation is to be expected from the low end and a small amount of high angle radiation from the high end. A reasonable back-to-front ratio is obtained for receiving as well as transmitting.

It is hoped that this short article may be of use in helping readers faced with the problem of a difficult location. There can be few locations which are "impossible" from an amateur standpoint today, provided a little imagination and ingenuity are applied, and the writer can say from personal experience that overcoming the problems involved in this type of work provides both a great deal of interest and much lasting satisfaction.

New Zealand Dx-er (*Contd. from p.* 316)

to many other magazines in Britain (including, of course, *The Radio Amateur*), Australia and the United States, not forgetting the contribution of items to the international Dx programmes of "Radio Australia" and "Radio Sweden."

Perhaps the most appreciated work done by Arthur and his colleagues, however, is the prisoner-of-war monitoring service which they have maintained since the start of the Korean war. Some 2,000 names, or half the known missing, have been listed after men have been missing for 12 to 14 months. Many parents, mainly American, have shown their gratitude in no uncertain way. During the 1939-45 war, over 6,000 prisoners' messages were passed on. The present work will be carried on until hostilities cease.

* * * * *

THE WILCOX-GAY VFO & 21 Mc/s.

by

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

THIS well-known piece of ex-government equipment offers three possibilities for driving a transmitter having the final stage working at 21 Mc/s.

Firstly, the output from the VFO may be taken at 7 Mc/s to a buffer stage also working at 7 Mc/s thence to a tripling stage at 21 Mc/s driving a final stage at the same frequency. The output from the VFO is not sufficient to feed, satisfactorily, straight in to a tripling stage. If it is desired to keep the VFO at 7 Mc/s output then the transmitter must have, at least, two valves before the final to ensure adequate drive throughout.

Secondly, the VFO can be tuned to give an output at 10.5 Mc/s for doubling to 21 Mc/s. Here again the drive is small and for good results it has been found necessary to use two stages tuned to 10.5 Mc/s after the VFO in order to get enough drive for doubling to 21 Mc/s. Following this with a final at 21 Mc/s means a total of four valves. The fact of using the VFO and two following stages all at 10.5 Mc/s may cause some undesirable effects. Apart from the foregoing remarks it was found that the VFO oscillator tuning (running at 5.25 Mc/s) was extremely tricky to tune, especially when using the zero beat method against a received carrier.

The third and remaining method of using the VFO output at **5.25** Mc/s offers the most stable and reliable—from the point of view of drive—means of driving a transmitter having a 21 Mc/s output. At the low frequency of 5.25 Mc/s output the VFO gives much more output than is obtainable at either 7 or 10.5 Mc/s and its oscillator tuning is much broader and considerably easier to work on zero beat.

With the multiplier working at 5.25 Mc/s, the oscillatory circuit operating at 2.625 Mc/s, ensures the highest degree of stability possible with this unit. The output is ample to drive in to the first stage of a transmitter doubling at 10.5 Mc/s which can be followed by a further doubler to 21 Mc/s and so to the final amplifier. The above arrangement allows for three valves but, in point of fact, the writer has had very successful results by using the 21 Mc/s doubler as the final stage with the aerial coupled through a tuning unit and link coil. The following general details of the transmitter may be of interest to those contemplating similar experiments. The DC voltage to the VFO unit is 170. Output (at 5.25 Mc/s as already described) is fed to a 6V6 doubling to 10.5 Mc/s which, in turn, drives an 807 doubling to 21 Mc/s. This stage runs with about 400 volts HT loaded—with the aerial coupled—to around 70 mA. With the resultant 28 watts or so input power all reports are T9 or T9X and no " pulling " troubles have been encountered in either stage. It is doubtful if a further amplifier stage will improve the signal note quality. For power purposes the amplifier would, of course, be desirable. Provided enough drive—not excessive—is available at each stage and that a well-regulated power supply is employed for the VFO and the transmitter, there should be no difficulty in radiating a good quality 21 Mc/s signal from a frequency doubling stage.

Finally, for those who may be interested, readings—taken on a standard model Wilcox-Gay VFO—for the three output frequencies herein discussed are given below. These can be taken as guides to approximate dial reading positions.

Output Frequency	*Switch Positions*	*Osc. Tuning*	*Multiplier Tuning*
7 Mc/s	Osc. 4 Multi. 3	16 Escutcheon 53 Dial	26 Escutcheon 68 Dial
10.5 Mc/s	Osc. 6 Multi. 3	19 Escutcheon 28 Dial	31.5 Escutcheon 55 Dial
5.25 Mc/s	Osc. 2 Multi. 2	19 Escutcheon 32 Dial	28 Escutcheon 4 Dial

FACTORS in the DESIGN of a SUPERHET PART I

by PETER J. L. BINNS, M.Sc.

THE TRF receiver still has many uses in the field of short wave radio, but, for fixed station use at least, the superhet is now generally preferred. Put in the simplest terms, this superiority is due to the greater ease in handling a number of fixed tuned, rather than variable tuned circuits. Let us, therefore, begin by examining these fixed tuned circuits in detail.

In designing a superhet for amateur communication purposes, and covering the frequency range from about 1.7-30 Mc/s, three factors are of prime importance: sensitivity, selectivity and image ratio. The first of these is bound up with noise level, and will be considered later. Turning then to selectivity, the superhet principle is to heterodyne the incoming signal, at a radio frequency within the range given above, to a lower intermediate frequency (IF) which remains fixed, regardless of the frequency of the incoming signal. This is done by using an oscillator tuned in step with the incoming signal, as will be familiar to most readers. The intermediate frequency chosen determines both the selectivity and the image ratio, for a given number of stages. Considering only selectivity, the lower the IF the greater this becomes. A conventional IF is about 460 kc/s and at this frequency two stages following the mixer (i.e. six tuned circuits) will give satisfactory selectivity for general listening to speech on the amateur bands.

But the gain per stage in the IF amplifier will also depend on the IF chosen, and the lower this is, the greater will be the gain. This factor is less important than selectivity, and can be offset to some extent by the use of high slope valves. Thus, in designing a superhet a low IF would seem advantageous. By making the IF as low as 50-100 kc/s (as was done in the early superhets), an extremely good adjacent channel selectivity is obtained; and two stages at this frequency give a performance approximating to the now well-known "Q5er," which is, of course, simply a converter stage followed by a selective low frequency amplifier.

This is satisfactory as long as the receiver coverage is confined to below about 10 Mc/s, but above this trouble will be experienced with bad image rejection. The incoming signal is heterodyned by the signal from the local oscillator, the frequency of which differs from the incoming signal by the IF. But another incoming signal, on the other side of the oscillator frequency, could be received if the frequency difference was equal to the IF. Thus, the two signals differ in frequency by twice the IF, and must be separated by the selectivity of the RF stages (if any) and the mixer input circuit (Fig. 1).

Hence the lower the IF and the higher the frequency of the incoming signal, the closer will be the required signal to the image. When the incoming signal reaches 30 Mc/s, and the IF is 450 kc/s, image rejection may be poor, as the "front end" of the receiver will have to separate signals at 30 Mc/s and 30.9 Mc/s, a difference of only 3%.

There are two ways of getting over this difficulty—either to increase the IF, thus making the frequency difference between the signals larger, or to increase the premixer selectivity, i.e. add more RF stages. In view of what has been said about selectivity and gain, the latter course would appear the best. But a practical limit to the number of RF stages is imposed by the fact that they must be gang tuned with the mixer and oscillator, in order to give "one knob" tuning. In a normal receiver, four gang tuned circuits are as many as can be managed, limiting the RF stages to two. Even this is not always simple, and three tuned circuits appears more favourable, if the IF can be raised to increase image rejection.

Now we have reached a fundamental point in our study of superhet design. Neglecting for the moment such things as converters, preselectors and double superhets (which will be considered later), there are two possible designs for an amateur communications receiver, remembering the frequency coverage required (1.7-30 Mc/s).

(1) *Use an IF of about 450 kc/s.* This will require two RF stages ahead of the mixer (i.e. four gang tuned circuits). Two stages of IF amplification (six tuned circuits) will provide satisfactory selectivity and gain for phone work: but additional selectivity would be most desirable for CW reception, and also for bad conditions on phone, etc.

(2) *Increase the IF to about 1.6 Mc/s.* This will allow one RF stage (three gang tuned circuits) to provide adequate image ratio. But two stages of IF amplification will not give adequate selectivity by themselves. By using modern high slope pentodes, the gain can be made sufficient with two stages. At this point, some approximate figures may be of interest (Fig. 2).

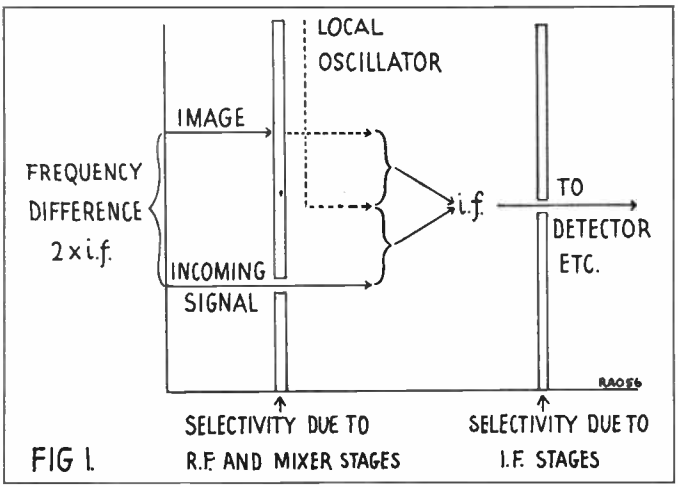


FIG 1.

From this it will be seen that some method for increasing the selectivity of the IF amplifier is very desirable. It may be considered almost essential in a communications receiver, unless a stage of amplification at 100 kc/s or less is in use (as in a double superhet, or when using a " Q5er ").

Methods for increasing selectivity.

There are three basic methods available, of which the first is of doubtful practical value, unless the number of stages is increased.

(1) *Increase the number of tuned circuits.* We are assuming that the number of stages is fixed, and no more IF valves are to be added to the design, so this method does not really apply. However, occasionally more tuned circuits are added without adding extra valves (Fig. 3). Another good example is the selective amplifier described in the 1951, April, handbook.

(2) *Controlled regeneration.* This method depends on the fact that when an IF (or, for that matter, RF) amplifier is made regenerative and just not oscillating, it becomes highly degenerative at all frequencies except the operating frequency. At the same time the gain increases somewhat, and the result is a considerable increase in selectivity.

This method is useful in amateur-built equipment, being simpler and cheaper than the crystal filter. But regeneration is rather difficult to control accurately unless there is a considerable reserve of gain available. The

IF Stage	Bandwidth in Kc for		
	Twice Down	10 × Down	100 × Down
One at 50 kc/s (iron core)	0.8	1.4	2.8
One at 455 kc/s (air core)	8.7	17.8	32.3
One at 455 kc/s (iron core)	4.3	10.3	20.4
Two at 455 kc/s (iron core)	2.9	6.4	10.8
Two at 1.6 Mc/s	11.0	16.6	27.4
Two at 5.0 Mc/s	25.8	46.0	100.0

Representative IF Selectivity Figures. (*Acknowledgements A.R.R.L. Handbook*).

Fig. 2.

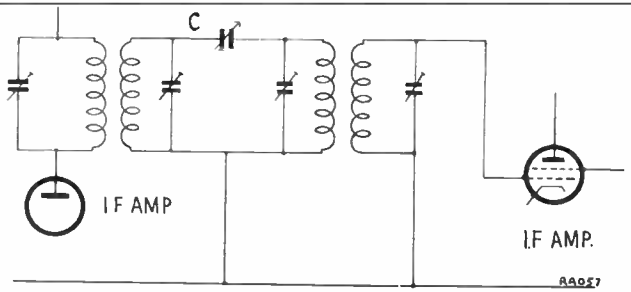


FIG. 3

Interstage coupling using two IF transformers. The value of C is 5-20 pf. (See "Radio Constructor," July, 1951.)

method is to arrange a small capacity between the anode and grid of an IF stage, or perhaps over two stages. This will rarely require the use of an actual condenser : running leads close to one another will generally be sufficient. The regeneration may be controlled by either the conventional cathode control, or by a potentiometer in the screen decoupling circuit (Fig. 4). In either case, the circuits are adjusted so that they just fail to oscillate at maximum gain. If the receiver has a "S" meter, this is easily noted as the point where the meter reading just begins to increase. Regeneration is then controlled by reducing the gain. Unfortunately, the very useful operating condition of full gain without regeneration cannot be obtained, and plenty of reserve must be available from the IF amplifier.

(3) *Crystal filters.* By incorporating a quartz crystal cut to resonate at the IF, an equivalent tuned circuit of very high Q can be obtained, and hence an extremely high degree of selectivity. It is not the purpose of this article to go into circuit details, but a representative circuit is given (Fig. 5).

In this circuit, the phasing condenser, C1, is adjusted to balance the capacity of the crystal when the greatest selectivity is required : when the circuit is not quite balanced the selectivity is less. A null point occurs, which can be adjusted, and is useful for removing an unwanted signal. By detuning the input circuit with C2, still higher selectivity can be obtained. The extremely sharp peaked response of the single crystal is ideal for CW reception, but not so satisfactory for phone work. But by judicious use of the

Controlled regeneration in an IF amplifier. In each case, the regenerative capacity, C, is arranged by proximity, of anode and grid leads. Regeneration is controlled by the potentiometer, P.)

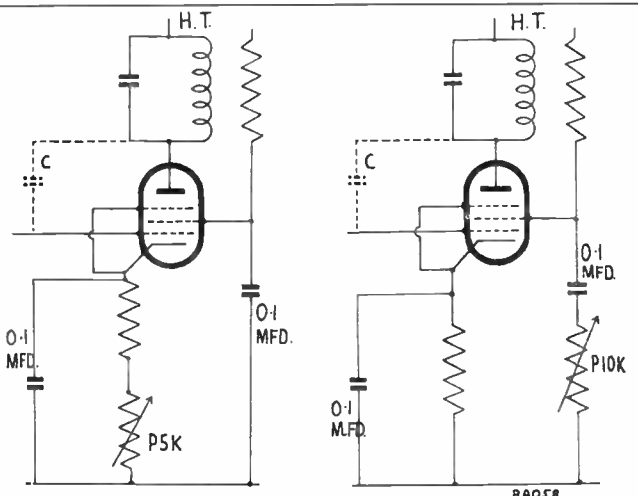
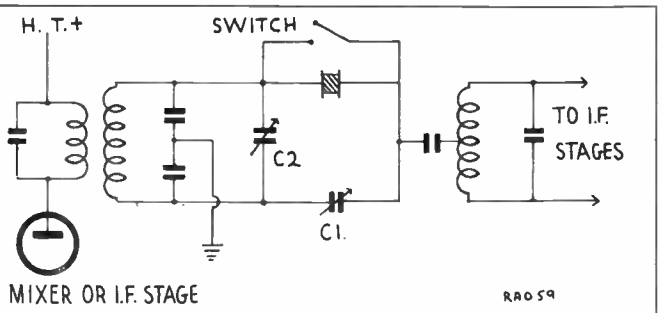


FIG 4



$C_1 = 2 — 10$ *pf.*
$C_2 = 5 — 50$ *pf.*
An extremely high degree of selectivity can be had by incorporating a quartz crystal cut to resonate at the IF frequency.

FIG.5. TYPICAL SINGLE CRYSTAL FILTER CIRCUIT.

controls C1 and C2 the pass band can be widened sufficiently to make the filter useful for all types of signal. For phone reception only, a somewhat improved performance can be obtained by using two crystals, separated in frequency by 2-3 kc/s, when a good flat-topped characteristic results. But in a general purpose receiver, for CW and phone, the first type of filter is more useful.

It is worth noting that with the circuit of Fig. 5 there are three tuned circuits (T1, T2, T3), as opposed to two if there were no crystal filter. Thus, the selectivity of the IF amplifier as a whole is somewhat greater, even when the crystal is out of circuit. (See above.) Readers who have a receiver using this type of circuit can check this by slightly detuning the coils T1, T2, T3 in turn with the crystal switched out, and noting the drop in output. If a crystal filter is required for a home-built receiver, the only satisfactory solution is to obtain one complete, including the coils, as the matching and impedence of these is very critical for optimum performance.

Increasing bandwidth.

So far, we have been considering methods for narrowing bandwidth, and thus increasing selectivity. But the reverse process is sometimes desirable, as, for example, when broadcast programmes are to be received. A critically tuned two-stage amplifier, even with an IF as high as 450 kc/s, may give more selectivity than is normally required. Thus, variable selectivity IF transformers are used. These may employ mechanical adjustment of coupling, variation of a resistance shunted across one of the windings, or a completely separate third winding : but the effects are similar. These transformers are particularly useful in double superhets employing a low second IF, where the maximum selectivity is very high. It is worth noting, from the constructor's point of view, that, although variable selectivity transformers are a valuable addition to any superhet, they can never increase the selectivity beyond that obtainable with ordinary transformers, critically adjusted. In the crystal filter circuit (Fig. 5), detuning the input circuit with C2 with the crystal switched out, will broaden the band-width somewhat, with slight loss of gain.

(To be continued next month)

THE RADIO CONSTRUCTOR

CONTENTS FOR NEXT ISSUE

A MAGNETIC TAPE RECORDER PT. II ● ECONOMY MAINS RECEIVER ● A PAIR OF MIDGET RX's ● REMOTE CONTROL BY RADIO ● A WARNING CIRCUIT FOR INTERMITTENT FAULTS, ETC.

THE *RADIO AMATEUR* VHF CONTEST

DATA ANALYSIS

by H. E. SMITH, G6UH

ONE of the main reasons in running our VHF Contests (the 3rd Contest being held on the weekend of May 24th last) was to obtain sufficient data on the operating conditions of various stations in all parts of the country and thus ascertain whether some relationship could be found between certain factors governing the ability of a VHF station to work over given distances, whether aerial height above sea-level is or is not a major factor in such cases, and any other factors which might reveal themselves as a result of these investigations. A large number of stations gave us considerable assistance by sending in their Logs for the Contest containing all the information asked for. Although we have made no world shattering discoveries, we *have* at least proved a few points of interest and we present these exactly as we found them.

Surrounding Terrain.

It was found impossible to assess from our Contest, any data on how surrounding terrain affects VHF operation. While we have no doubt whatever that it does play a large part, the details were not comprehensive enough (nor could we expect them to be) for any accurate curves to be drawn up. No two QTH's are alike in this respect and this problem must remain a complex one, and we do not for the moment see how any reliable data can be obtained on it.

Power and types of aerial.

The total number of results received was too small to investigate fully the variations with different inputs and different types of aerial, but it is clear that neither of these are important factors in distance worked relationships, that is, high powered stations do not on the whole work greater distances than the low-powered ones, and *within limits* no one type of aerial gives consistently better results than any other type. It is clear, though, that the simple dipole is much inferior to any other type of aerial.

Distance per contact relative to height.

The only variables really suitable for investigation were :—

(*a*) Average distance per contact.
(*b*) Total height above sea-level.
(*c*) Aerial height.

(*Note*.—Average distance per contact was decided upon as some stations spent longer on the band during the Contest than others, thus to use the total mileage figure would have produced inaccurate data.)

Data was compiled from stations who spent a major part of the time active during the Contests and those who only spent a short time on the band and worked only a few stations are not included.

For ease of working and convenience, heights above sea-level were taken to the nearest 50 feet, aerial heights above ground

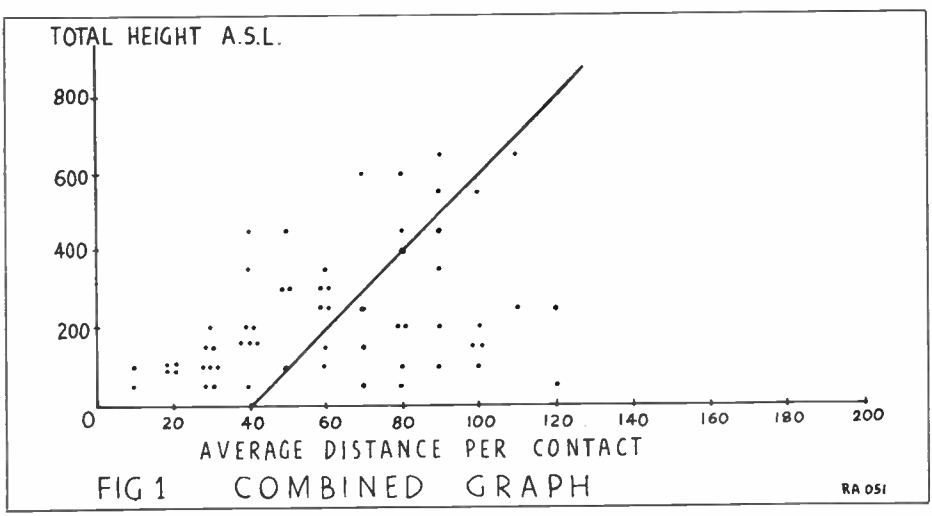


FIG 1 COMBINED GRAPH

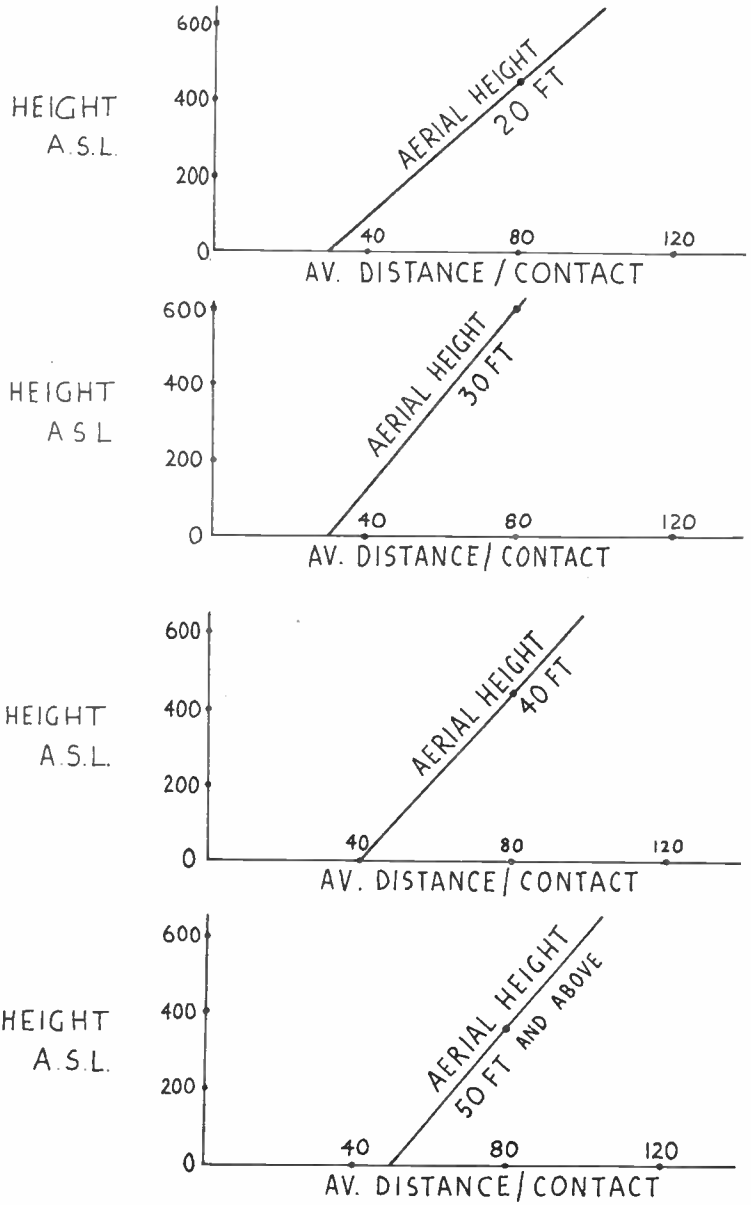


FIG 2. AERIAL HEIGHT GRAPHS RA 052

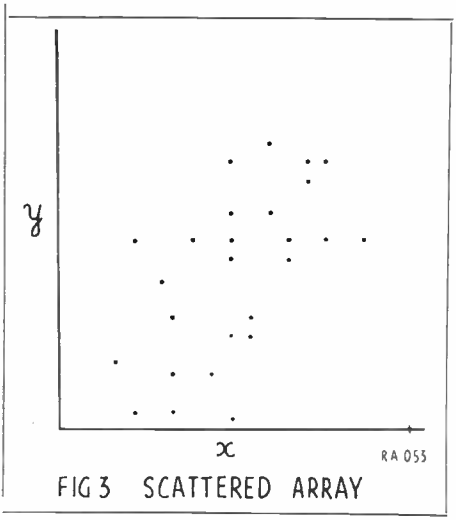


FIG 3 SCATTERED ARRAY

to the nearest 10 feet, and average distance per contact to the nearest 10 feet.

Stations who had sent entries for more than one of the Contests were given an average for their combined entry, provided that they had not changed their aerial height.

From the above, we were able to extract approximately **60** sets of usable data. These points were plotted on graphs of Height Above Sea-Level and Average Distance per Contact. Five such graphs were plotted, one containing all the points and four for the individual aerial heights, 20 ft, 30 ft, 40 ft and 50 ft and over. Lines were drawn through the sets of points in accordance with the principles described in the mathematical note which will be found at the end of these notes.

Conclusions.

(1) All graphs had a definite positive slope, showing a general tendency for distance per contact to increase with height above sea-level. There is, therefore, no doubt whatever that irrespective of the nature of surrounding terrain, height above sea-level of the actual QTH does play a large part in Dx operation on VHF.

(2) The individual aerial height graphs showed a remarkable similarity to one another. Although there were indications that very high aerials were advantageous, and that very low aerials were disadvantageous, there was no positive indication of any wide variations in distance per contact with aerial heights in the range 20-50 ft (a range which included almost everyone).

(3) From the final line representing the relationship between height above sea-level and average distance per contact it is concluded that a fair and simple judging system for VHF Contests would be to add 400 to the total height above sea-level and divide the total number of miles worked by the figure so obtained. This system would neither penalise stations in a high QTH or unduly favour stations situated at low levels.

[**Mathematical notes on drawing a curve through a scattered array of points.**—A number of points plotted graphically and not usually lying on a smooth curve is known as a scatter diagram, a typical example being shown in Fig. 3. Usually the curve which fits the points is not at all obvious, and often several equally good lines may be drawn, the final choice depending on the purpose for which the curve is required. The simplest method is to draw a series of equi-distant lines horizontally on the graph and plot the means of the points which are situated between adjacent lines, which was, in fact, the method adopted in this case.

The points so obtained lie on a smooth curve known as a *regression* curve. This is often a straight line, and in very scattered distributions it is always taken as such. The formation of a regression curve is shown in Fig. 4. As shown, the line is known as the regression line of x on y. If the lines are drawn vertically, a different line is obtained, the regression line of y on x. Other lines may be drawn through the points but these are more difficult to calculate, and in any case are of little or no use for practical purposes. A very good approximation to the regression line may be obtained by dividing the points into two halves by means of a horizontal line and joining the centroids of the points in each half. In our case, the y axis was used for the height above sea-level and the x axis for the average distance per contact. For any individual station the height above sea-level is a fixed quantity, and the average distance per contact may vary. Because of this, the regression line of x on y is the correct one to use when examining the relationship between the two variables.]

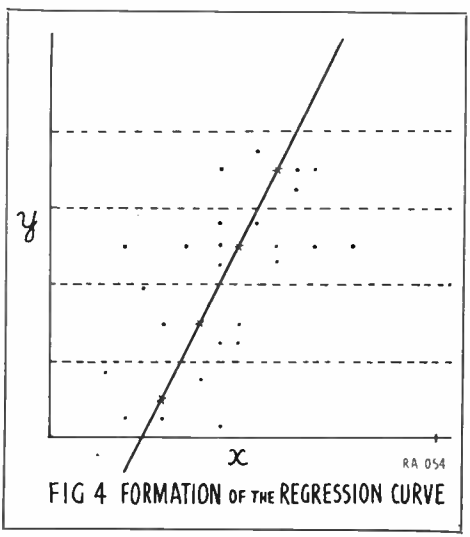
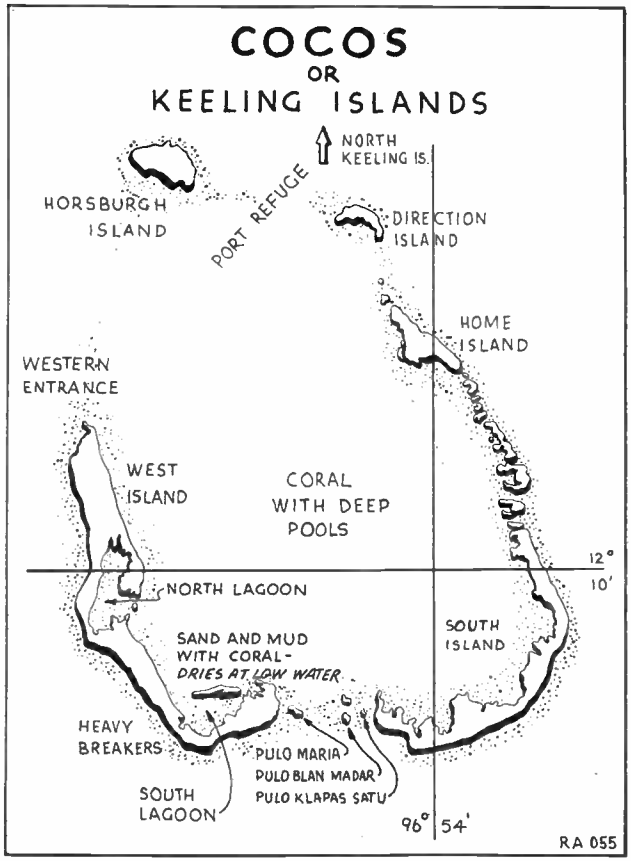


FIG 4 FORMATION OF THE REGRESSION CURVE



DX COUNTRIES NO. 8

COCOS ISLANDS

by

J. C. SYMES

ZC2MAC has recently provided many of us with yet another new country to add to our 20 metres Dx totals. The Cocos Islands, or Keeling-Cocos to be more correct, are situated in the Indian Ocean, 600 miles south-west of Java Head and half-way between Ceylon and Australia. The group consists of twenty-three islets, the most important of them being Home Island and Direction Island. A glance at the map will show you how these coral islands are distributed around the central lagoon.

Although the islands were annexed by Great Britain in 1857, the inhabitants were virtually ruled by the Clunies-Ross family from 1835 until 1944. Known as the " Kings of the Cocos," this family contrived to establish a veritable Arcadia within these beautiful islands. As the romantic story of the Clunies-Ross dynasty would quickly run away with my allotted 400 words it must suffice to say that their endeavours produced a happy, well-cared-for community throughout their reign, despite the frequent disasters brought about by hurricanes.

In 1900 it was decided to make the Keeling-Cocos Islands the focal point for three main cable routes, namely, one to Africa via Rodriguez and Mauritius; the second to Asia via Java; and the third to Perth, Australia. Thus, everyday contacts with three main continents were established. The advent of the Cable Station brought many, hitherto unknown, advantages to the group, but also made the islands an obvious target for an enemy in the event of war. The first unpleasant episode occurred during World War No. 1. On November 9th, 1914, a strange, four-funnelled warship was seen off-shore. Quickly recognised as the armed raider *Emden*, the news was flashed to the world. A German landing party smashed the Cable Station but was quickly recalled as *HMAS Sydney* steamed up to intercept, finally sinking the *Emden* off North Keeling Island. The second incident took place during the second World War when a Japanese warship attempted to wipe out the Cable Station. By a clever ruse, the Japanese

(*Contd on p.* 343)

WORKSHOP PRACTICE

by C. H. LAMBORN

MEASURING INSTRUMENTS.

The Rule.

Little need be said regarding the reading of a rule, as this is, or should be, common knowledge. However, a few words about its care should not come amiss, as most measurements taken depend upon this essential and much abused tool, and if inaccurate, good work can be spoilt and much time and money wasted. The most useful size in the shack for general purposes for small work is the 6 inch steel rule, with graduations of 1/8th, 1/16th, 1/32nd and 1/64th inch for panels, and larger duty, a 2 ft folding rule should be all that is required. The rule should be stored carefully in a separate place and not with other tools or objects, which will touch and mar its edges or deface its surface.

The principal use of the rule is to be able to read the graduations and unless these can easily be seen it is useless. Also remember, that to mark out a job accurately the rule must lay perfectly flat, therefore do not allow heavy objects to lay upon it, otherwise your rule will become bent and out of line. Keep it free from dirt and rust and when it is put away wipe a slightly greasy rag across its surface.

Outside and Inside Calipers.

These tools are invariably used for the measurement of diameters where extreme accuracy is not essential. The spring and twist in the legs preclude them for very accurate work, but by practice one can develop a " feel," by which the measurements are sufficiently accurate for general purposes. When taking a measurement from a rule hold the calipers at right-angles to it, with one leg against the *end* of the rule, the reading being taken from the other leg. It is easier to open the calipers to a greater diameter than that being measured and to then adjust by tapping one leg against the bench until the reading is accurate. Spring calipers, if available, are easier and quicker to adjust and obviate tapping. The setting for these is the same as ordinary calipers.

Vernier Calipers.

These consist of a beam similar to a steel rule, which is inscribed in inches and divided into fortieths, each 4/40th or 1/10th in. being numbered. The vernier, a sliding scale, has 25 divisions, the scale in length being equal to 24 divisions on the beam. Thus, it is 1/40th short, and in consequence each division on the vernier will be 1/25th in of 1/40th in short, which is equal to 1/1,000th in, i.e., 1/25 × 1/40 = 1/1,000 in. The reading is then made up by the addition of the following :—

A	Number of whole inches on beam before vernier	3
B	Number of whole tenths visible in vernier = 5 = 5/10	.0500
C	Number of whole fortieths visible in vernier = 0 = 0 . .	.000
D	Number of the vernier line which coincides with the line on the beam = 13 = 13/1,000	.013
		3.513 in

When taking readings care must be exercised not to exert any pressure on the work. The jaws should only just touch and hold the work lightly.

Micrometers are seldom found in amateur shacks, being far too expensive for the average pocket, so it is not proposed to deal with them in these articles.

The Wire Gauge.

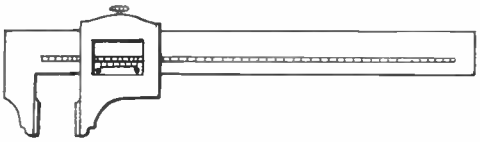
If no micrometer is available some method must be devised to measure the diameter of wires. This is most important, because wires of all sizes are extensively used in all apparatus connected with radio and attempting to guess the diameter of the finer gauges is practically impossible.

The cheapest and most satisfactory tool developed for this work is the British Standard wire gauge and one should be purchased by all amateurs.

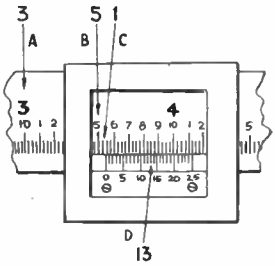
It consists of two circular plates hinged at the edge with slots around the diameters, each slot being numbered from 1 to 30. The diameter of each slot represents a standard gauge of wire and has the number inscribed above it. When checking a piece of wire for size, move it around the edge of the gauge until it fits perfectly without undue pressure into a slot. The number above the slot is the wire gauge and if the diameter is required tables are available which give the required details in decimals of an inch.

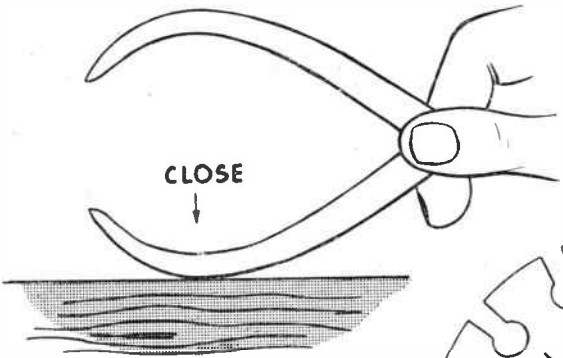
When checking enamel wire, obviously the thickness of the coating will not allow the wire to enter the correct slot representing its gauge, but it will enter the slot one gauge larger in size. Consequently, always take the reading of the slot below as the correct figure, i.e. No. 22 gauge enamel wire will fit the slot marked 21 and will not enter 22 unless the enamel is polished off the wire. No. 22 is, therefore, the correct size. When checking double or single silk or cotton-covered wires, always carefully remove the covering first, otherwise an inaccurate reading will be obtained.

(*Contd. on p.* 343)

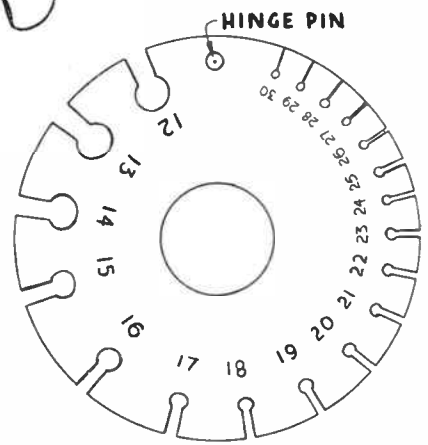


VERNIER CALIPER

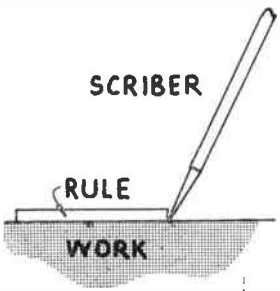


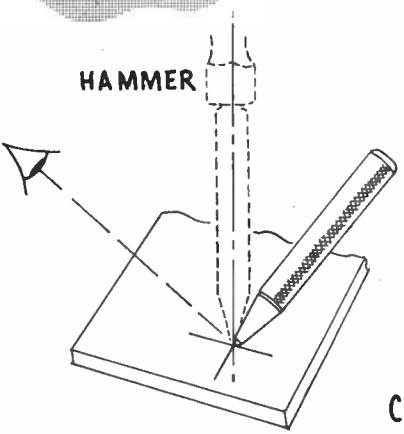


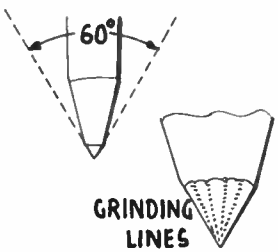
CALIPERS



BRITISH STANDARD WIRE GAUGE







CENTRE PUNCH

INCLINE PUNCH TO WORK
& THEN BRING TO VERTICAL

BROADCAST BANDS REVIEW

by JACK FAIRS

All Times GMT.

" Nf " :—New Frequency.

GENERAL reception conditions for our friends " way down under " in New Zealand appear to have remained very favourable during the past month, and much fine Dx has been duly logged ; over here in these islands of ours nothing outstanding seems to have been heard by our regular reporters, though in view of the atrocious noises which persist at certain times on the Broadcast frequencies, one can hardly expect extraordinary reception of the weaker and more distant stations !

EUROPE.

Belgium. By the time these lines appear in print, the test transmissions of " Radio-diffusion Nationale Belge " at Brussels will be almost completed. However, for the sake of the record, here are brief details, and the list of frequencies allocated should prove to be useful in the near future. The new transmitters have the call-sign ORU, and are located at Wavre, some 15 miles from Brussels.

From August 1st to 15th : 1700-2315 with 100 kW on 9 Mc/s and 20 kW on 11 Mc/s, and 2330-0500 with both Tx's on 9 Mc/s plus OTC Leopoldville, 50 kW, on 9 Mc/s for North America. Probable frequencies for ORU : 9665, 9745, 9770, 11720, 11850 and 11893 kc/s.

From August 16th to 31st : Practically as above, but with the addition of 15 and 17 Mc/s outlets at 1000-1300 (or 1400) ; the 20 kW Tx to be replaced by a second 100 kW one. More frequencies may be brought into use : 5970, 7170, 15280, 15335, 17845, 17860, 21510, 21715, 25630 and 25760 kc/s.

OTC Leopoldville, Belgian Congo, has been allocated 6140, 7200, 11760, 15170, 17745 and 21680 kc/s, in addition to the existing 9745 and 9770 kc/s channels. A new schedule is due to commence on September 1st, but details are, unfortunately, not available at the time of writing. Period reports are earnestly requested, and should be sent to : Overseas Department, Belgian National Broadcasting Service, P.O. Box 26, Brussels, Belgium. (L/Cpl. T. Marlow, of MELF15, World Radio Handbook, " Sweden Calling Dxers," OTC and others.)

Norway. The 9550 kc/s channel of " Radio Norway " is now known to be LLD, that of 9540 kc/s remaining as LKJ.

Italy. Rome, on 3930 kc/s, is again heard in the evenings, carrying the Third Programme of " Radio Italiana " in parallel with Milan on 6240 kc/s. (Scribe.)

Germany (US Sector of Berlin). RIAS (" Radio in American Sector ") is now on the air 24 hours a day on the 6005 kc/s frequency, according to a letter verification received by Sidney Pearce, Berkhamsted.

Spain. " Radio Falange de Oviedo," Oviedo, on 7230 kc/s has been logged by W. P. Griffith, of Ashtead, Surrey, with S8 signals around 2110 on Sundays.

Vatican City. HVJ " Radio Vaticano " is now using the 9550 kc/s frequency (listed as HVJ8) and is heard opening at 1715 (Scribe) and with English at 1815 announcing as on " 19, 25 and 31 metres." (Pearce.) Actual frequencies are 15120, 11740, 11685 and 9550 kc/s for this transmission, and some, if not all, are presumably used by the new 100 kW Tx's.

Roumania. The English programmes from Bucharest are now at 2100-2145 on 9250 and 12032 kc/s, also over " Radio Romana Libera " on 6210 kc/s. (Sidney Pearce and Scribe.) OTC Dx Programme has given the following schedule for all three outlets : 1145-1200, Greek ; 1730-1800, Serbian ; 1800-1830, Russian ; 1830-1900, Greek ; 1900-1930, German ; 1930-2000 either Roumanian, Yiddish or Hebrew ; 2000-2015, Italian ; 2015-2100, French ; 2100-2145, English.

Finland. OIX4, Pori, 15190 kc/s : S9 around 1900-2000 on July 19th with a special transmission for New York of an English commentary on the opening ceremony of the Olympic Games at Helsinki—including the brief announcement by that " mysterious " young lady who tried to grab the " mike " ! (Scribe.)

AFRICA.

Kenya. Nairobi on 4855 kc/s has BBC News at 1800, followed at 1815 by local news (supplied by the " East African Standard "), weather report, and South African News. Sign-off on weekdays is after the 11 p.m. time pips (2000 GMT) and on Sundays at 1900 after the Epiloque. (Pearce.)

Uganda. Arthur Cushen, Invercargill, New Zealand, tells us that a new broadcast and short-wave service is to be built under BBC technicians in Uganda, which will (we hope) give everyone a new country !

Tangier. " Radio Internationale," 6110 kc/s, is heard by Sidney Pearce opening in French from 2000, later in Spanish with occasional French announcements. The Swedish-language "Dux Radio" Programmes have been heard at 2000-2030 on Tuesdays

with repeats on Thursdays at the same time. " Radio Africa," Tangier, also carries these transmissions as mentioned last month.

Sudan. " Radio Omdurman " is heard in Arabic around 1830 on approx. 7000 kc/s (Nf). (Pearce.)

Senegal (FWA). Charles Tenot (ISWL/F4174), of Dakar, sends along the latest schedules of " Radio-Dakar," now known as " The Broadcasting of French West Africa." " *Dakar-Inter* " (French Network) is on 1435 and 11895 kc/s at 0630-0800, 1200-1400, 1900-2300 weekdays, and 0700-1400, 1700-2300 Sundays. " *Dakar-Africa* " (African Network) uses 1470 and 9710 kc/s at 0700-0815, 1230-1345, 1700-2230 weekdays only. " Dakar-Africa " broadcasts news in African languages and programmes of request records. Many thanks for the news, OM. (So it looks as if the 15 Mc/s outlet, which used to be heard so well in Britain, is now abandoned.)

Cape Verde Islands. CR4AA, " Radio Clube de Cabo Verde," Praia, have sent their QSL card to Sidney Pearce, for reception near 7112 kc/s ; the schedule is given as 2000-2200 on " 42 and 50.89 metres." Sidney says he still hears them on the 7 Mc/s frequency, signing-on at 2000, which is half an hour earlier than before.

French Equatorial Africa. " Radio Chad " on 15595 kc/s has verified a report from Ian Hardwick (Thames Line, NZ), for this frequency, giving the following information. Schedule : 0530-0630 and 1805-1835 (all in Arabic) ; power is 4 kW. QRA : " Radio Chad," PO Box 758, Brazzaville, FEA.

NEAR EAST.

Israel. " Kol Israel," Tel Aviv, now broadcasts the English " Voice of Zion " Programme at 2015-2100 daily on 9010 kc/s ; the first English News is at 1045, and the second at 1915-1930 daily on 9010 and 6830 kc/s. (Pearce and Scribe.)

Lebanon. " Radio Liban," Bierut, 8036 kc/s, now closes at 2130 (previously 2100) with a French march after news in Arabic. (Pearce.)

ASIA.

Thailand (Siam). Low-powered experimental stations in this country are HS1JS of the Thai Army Signal Corps., Bangkok, on 4875 kc/s (500 watts) and 6000 kc/s (300 watts) ; HSE2 belongs to the Territorial Department, Bangkok, using 6175 kc/s (200 watts ; and HSU2 of the Thai Royal Air Force at Don Muang, runs 200 watts on 6055 kc/s. (World Radio Handbook.) Times are not given, but chances of hearing any of these stations on their present frequencies here in Britain, are, we may add, extremely remote !

Ceylon. " Radio Ceylon," Colombo, has been logged during July at 1703 calling Australia for a test transmission (Commencing 1705) on the regular 11975 kc/s channel. (Pearce.)

Japan. Arthur Cushen has received a colourful QSL card from " Radio Japan " (International Service) and the latest schedule for these programmes runs as follows : 0500-0600 to North America over JOA5 (15235) and JOB4 (11705) ; 1100-1200 to North China over JOA4 (11705) and JOB3 (9675) ; 1200-1300 to Central China (as for 1100-1200); 1400-1500 to Philippines/Indonesia, and 1530-1630 to India/Pakistan, all over JOA4 (11705) and JOB5 (15235 kc/s). (All of which gives us a Nf—15235—and a rather confusing multiplicity of call-signs ! Scribe.)

Pakistan. " Radio Pakistan," Karachi, is now testing at 0115-0200 on 11885 and 15335 kc/s with programmes of native music and songs for South-East Asia. The General Overseas Service with dictation-speed news in English is still at 1710-1730 over 7010 and 9484 kc/s, and these two close at 1915 after the Arabic broadcast. (Yes, the 7 Mc/s transmissions are still going strong with 50 kW on this amateur frequency !) 9484 and 11914 kc/s open in parallel at 1930 with tests to Turkey and the UK. (Pearce and Scribe.) Note : the 11 Mc/s channel is decidedly 11914 kc/s, and *not* 11940 as reported elsewhere.

PACIFIC.

Dutch New Guinea. Hollandia is now testing on 5090 kc/s (Nf) at 0930-1200, in parallel with the 7135 kc/s outlet. (NZ Dx Times.)

Philippines. Missionary Station DZB2 of the Far East Broadcasting Company, Manila, has been noted on 3345 kc/s (measured) instead of the former 3325 kc/s. (NZ Dx Times.)

NORTH AND CENTRAL AMERICA.

United States. WRUL " Radio Boston, The Voice of Freedom," has replaced 11740 kc/s by 15280 (Nf), for the individual English programme to Europe at 2000-2100 ; 15350 kc/s remains in parallel. (Sidney Pearce.)

Jamaica. " Radio Jamaica " : Q3 S4 on 4950 kc/s at 2340 with a sponsored programme of dance music. (Scribe.)

Nicaragua. Station YNWW, " Radio Sport," Granada, has been found on 7850 kc/s (Nf) with fair signals but CW QRM to sign-off at 0400. (Cushen.) (This must be a move from 5965 kc/s.)

Guatemala. TGWB, " Radio Nacional, La Voz de Guatemala," Guatemala City, is now operating on 6180 kc/s (Nf—from 6440) and logged at 0300 to sign-off at 0500, in parallel with TGWA on 9760 kc/s ; occasional English announcements have been heard. (Arthur Cushen and Ian Hardwick.)

El Salvador. World Radio Handbook gives the following news on stations in this country.

YSS, San Salvador, is operating on 6010 and 9555 kc/s (5 kW each) at 1800-1900 and 0000-0400; the call is "Radio Nacional YSS, Alma Cuscatleca." (The last news we had of this one was about three years ago, when they were on 4780 kc/s.) YSC, San Salvador, on 6095 kc/s now has the call "Ondas Populares y Departivas"—previously listed as "Radio Mil Veinticinco."

Haiti. Station 4VRW, "Radio Haiti," at Port-au-Prince, is now heard on approx. 9990 kc/s (Nf), often quite good at 2300; News in French is aired at 2330. (Pearce.) "Radio Station 4VEH" is on the air again, by the way, and is reported heard in Sweden on about 9630 kc/s around 0330-0350. ("Sweden Calling Dx-ers.")

Panama. HP5B, "Radio Miramar," Panama City, 6030 kc/s, is a good signal in New Zealand to close at 0600. (Cushen.)

Costa Rica. "Radio Athenea," San José, operates TIRS on 920 kc/s (MW) and TIHH on 11972 kc/s, according to a verification. QRA is "Radio Athenea," Apartado 2208, San José. (Radio Sweden.) W. P. Griffith has been listening to the 11 Mc/s channel, and reports S8 signals to sign-off at 0400 or, on occasions, extended to after 0430.

Cuba. COBZ, "Radio Salas," Havana, 9030 kc/s: Q4 S5 with "English by Radio" at 2310; also COKG at Santiago de Cuba, 8955 kc/s: Q4-5 S7-8 with call at 2330, "Cadena Oriental de Radio, Santiago de Cuba . . ." (Scribe.) COBL, "Radio Cadena Suaritas," Havana, 9833 kc/s, is logged by W. P. Griffith with S6 signals at 0345, but is wiped out by Budapest at 0400 on the same frequency. W.P.G. has got a letter veri from COBL, which says other stations are CMBL on MW and FM station CM2IL.

SOUTH AMERICA.

Brazil. "Radio Tamoio," Rio de Janeiro, is now heard at fine strength on 6200 kc/s (Nf) under the call-sign ZYC7, in parallel with ZYC8 (9610 kc/s) to sign-off at 0230. (Arthur Cushen.) "Radio Nacional," Rio de Janeiro, is again using PRL9, 6147 kc/s, and logged with good signals in New Zealand. (Cushen.) These two are, presumably, "winter" frequencies.

PRL4, "Radio Ministerio de Educaçao e Saude," Rio de Janeiro, 9770 kc/s, has replaced PRL5 (11950 kc/s), and can often be heard with an English lesson at 2200-2210. (Pearce and Scribe.)

Ecuador. HCJB, "The Voice of the Andes," Quito, have sent Sidney Pearce a QSL card for reception on 9745 kc/s, plus a hand-painted Indian scene souvenir in balsa-wood. Sidney says the English broadcast commencing at 2100 is often better on 15115 kc/s than the 17892 kc/s channel. Ronald Thorndike did quite a fair amount of listening to HCJB during a recent weekend break from RAF routine, and lists the new 11915 kc/s outlet at good strength from around 0500 at various times to 0800. The 9745 kc/s frequency was not, however, so consistent, being troubled by Moscow QRM. English transmissions heard at these times are "Children's Bible Hour" to 0530, and "Southern Cross Salute" at 0630-0800. For those who cannot listen at the above times, we would add that HCJB is often well heard here around 2345 (9745 and 11915 kc/s).

Colombia. Station HJEF, "Radiodifusora de Occidente," at Cali, 4765 kc/s (the lowest in frequency of all the HJ's on short-wave), is heard in Spanish to 0400 on weekdays and 0600 on Sundays. (Ian Hardwick.) HJFV, "Radio Neiva," Neiva, 4855 kc/s, closes at 0500 with the National Anthem (Hardwick), and audible over here (Q4 S5-6) around 2220 with call. (Scribe.)

HJCF, "La Voz de Bogota," Bogota, 5960 kc/s, has been logged by W. P. Griffith, S6 at sign-off (0400), but some QRM from HI4T, Trujillo City.

Argentina. LRA, Buenos Aires (SIRA), 17720 kc/s: Q5 S8-9 around 1950. (Ron Thorndike. Rx: Pye 5SH.) Heard later with special dedicatory programmes on the death of Eva Perón, wife of the President of the Republic. (Scribe.)

Venezuela. YVNB, "Ondas de las Médanos," Coro, 4820 kc/s (mentioned last month), is now known to be on the air at 1130-0330, relaying MW station YVNA on 1130 kc/s. (WRH.) A new YV located in the capital, Caracas, has been discovered by Arthur Cushen on 4200 kc/s testing on Sundays to 0545 or 0645 on one occasion. YVMM, "Radio Coro," Coro, 4910 kc/s, signs off at 0500 Sundays, and verifies reports by QSL cards from the Director, Mr. Roger Leyba. (NZ Dx Times.)

Peru. Station OAX4S, "Radio San Christobal," at Lima, previously listed on 5965 and more recently on 6070 kc/s, is now reported varying frequency from day to day around the 6380-6550 kc/s region; a new 11 Mc/s outlet will soon be opened. (WRH.)

OAX4T, "Radio Nacional del Peru," Lima, is now heard on 9530 kc/s (Nf) to sign-off at 0455. (Ian Hardwick.) Sidney Pearce lists this one near 9535 kc/s until close with the National Anthem around 0555 (probably Sundays).

Falkland Islands. From time to time, rather vague reports have appeared in various places about broadcasting in this remote corner of the Commonwealth, and for quite a long while we have cherished an entry in our own station list against 3600 kc/s which reads "VPC

Port Stanley" ! However, WRH has received confirmation from a correspondent in Brazil, that a Broadcasting Station in Port Stanley is actually operating with 250 watts each on 1500 and 3400 kc/s. The power is due to be increased to 5 kW next year, and the schedule runs thus: Mon. at 0030-0130, 2315-0100 (Tues.); Wed. at 2315-0100 (Thurs.); Fri. at 2315-0100 (Sat.); Sat. at 2100-2200; Sun. at 2100-2200, 2300-2359.

QSL SECTION.

Verifications received by readers during the past two months.

Ian Hardwick (Thames Line, NZ). Teagu (4777), CKNA, CKRZ, Radio Free Europe (6095/7165/7300), Budapest (6248/7220), VED, Mogadishu, Pusan (7935), Belgrade, Radio Sweden (9525), OIX2, JKL (9605), CSA92, JKI (11825), BED3 (15235), BED4 (11800), BED6 (11735), VLG11 (11810), VLB21 (21540), VLB15 (15160), VLC15 (15200), YVKR, Radio-Algerié (6145), ICRC Geneva (7210), Warsaw (9525), XEQQ, Munich, Tangier (both 9540), BFEBS (11820) and Radio-Chad (15595).

Ronald Thorndike (Lyneham). Bucharest (9252), Cairo, TGWA (15170) and Damascus (11915).

James Kyle, M.B. (Portrush). Luanda (11865), Baghdad (11724), OAX4T (9562), Sharq al Adna (6790/9650), HROW (6675), Damascus and Radio Pakistan.

Manfred Lepple (Stuttgart). DZH7 (9730), FZI (11970), Djeddah (11850/11950), ZYK3 (9565) and ZNB Mafeking (8230).

Sidney Pearce (Berkhamsted). Mogadishu, FBS Nairobi, Radio-Africa (via Dux Radio), Baghdad (11724), EPB (15100), Omdurman, TIHH (11972), PRN9, ZAA, Athens (9607), ZNB, VLQ9, LLN, LLM, Rome (15400/17800) Cairo (9715), Hörby (9620), Radio Free Europe (9080), COBZ (9025), CR6RB (9165), OZH4 (15165), OZF (9520), HCJB, RIAS Berlin (6005), OXI (5964) and CR4AA (7112).

Phil. Allwood (Minsterley). ZNB, Bucharest, Munich (6160), Peking (15060), Sofia (7670), ZYK3 and Hörby (6095).

Ivor J. Street (Worcester). Cairo, Radio-Jamaica, Salisbury and Paramaribo.

Mike O'Sullivan (West Hartlepool). ZYK21 (3265), YVKB (3400), HVJ (5968), 4XB44 (6725), ICRC Geneva, 4XB31, FIQA (9515), VLB9 (9580), Radio Free Europe (9607), CR7BJ (9732), BED6, Peking and CKLX.

W. P. Griffith (Ashtead). VOA Munich, Saigon (11930), HC4EB (6870), HO5O (5995), Angmagssalik (12300—via OXI Godthaab), COBL, HROW (6670), CSA92 and TGNA (9668).

Arthur Cushen (Invercargill, NZ). CBFO, TAT, BED3, Mogadishu, BFEBS (15435), OAX4T, BEC32 (9790), JOA (6069), JOB (7180), JOA2 (9675), JOB2 (11705), YVMM (4910), JKI (9605), JKL (11825), VLC7 and HCJB (9750).

CONCLUSION.

Contrary to our promise last month to include the Honour Roll, it appeared to have vanished into thin air ! So we are featuring it this month (hoping the space is available) and including last month's score, where different, in brackets.

The Editor and your Scribe thank everyone for their letters, and due acknowledgments are made to all contributors to this column. Broadcast News should be sent direct to : J. Fairs, 2a, Durham Road, Redcar, Yorkshire, England, to arrive before the 26th of September.

Best 73 and Good Listening.

HONOUR ROLL

1.	Sidney Pearce	130
2.	Arthur Cushen (NZ) ..	127
3.	Jack Fairs (86)	87
4.	Mike O'Sullivan	85
5.	Roy Patrick	83
6.	Carl Shapiro	80
7.	Stanley Coppel	76
8.	Ivor J. Street	75
9.	William P. Griffith (69) ..	74
10.	David A. Dary (USA) ..	66
11.	Dr. James Kyle	64
12.	Ian Hardwick (NZ) (62) ..	63
13.	Manfred Lepple (Germany) (54) ..	58
14.	Bert Clear	55
15.	Ronald Thorndike	54
16.	Michael Hutchins	42
17.	John Bell	37
	A. J. Allmey..	37
18.	Phil. Allwood	36
19.	Alex Mackenzie	34
20.	Kalevi Ant-Wuorinen (Finland)	31

On the Higher Frequencies.

(*Contd. from p.* 338)

So we come to the end of yet another month's reports. Many thanks to you all for the interesting gen. and for all your comments on these columns. It is most pleasing to hear that we are finding favour with so many. So until next month, good luck and Dx to all.

G6UH.

Stop Press. G5TZ (old Jumbo), Newport, I.O.W., will be back on the band at *any moment.*

* * * *

ON THE HIGHER FREQUENCIES

Monthly Notes and News

Conducted by H. E. SMITH, G6UH

CONDITIONS during July appear to have been extremely patchy. Some reports are of new contacts and good Dx conditions, others speak of poor conditions generally with no Dx heard at all. Your conductor was away on holiday for two weeks of this period so we were unable to make a complete check on conditions personally. One thing, however, is faily certain, conditions this year are not as good as last, and certainly far below those existing during the summer of 1949. In spite of this, there are many more stations active on the VHF bands and one hears new call-signs almost every week. This is a very satisfactory sign and it is good to hear these newcomers to the bands taking the job really seriously, but what a pity it is, that due to misguided efforts to promote activity in certain quarters, by arranging long-drawn-out Contests and "New Counties Races," the 144 Mc/s band is tending to become populated with *listeners only*, all waiting for a new County and with no time to waste in working new stations who are unfortunate enough to be situated in a county which is already over-populated with VHF stations ! Comments on our own Contest continue to come in, and we are now more than ever convinced that the height above sea-level handicap put a great number of stations off. Curiously enough, although we have received many letters disagreeing with the method of judging, the majority of these stations also disagree with the points system used by most Contest organisers, and so far, we have not had one single alternative system suggested. As we have stated before, we are well aware that the question of surrounding terrain is an important one, there is no workable method of including this in any VHF Contest rules. Then again there is the question of height above *local screening*. This will, of course, vary with each individual station. For instance, the average station, as shown by our Contest results, does not work a noticeably greater distance per contact whether his aerial is 20 feet high or 50 feet. G5YV, however, finds that there is an amazing difference when his aerial is raised from 30 to 60 feet above ground. The local screening in his case is *trees*. This again shows how impossible it is to generalise on the subject. So now to our notes for the newcomer.

The VHF Newcomer.

First of all this month, we shall deal with the question of reporting on signals heard. Several transmitting readers have written in on this point, and while all are agreed that the listener report is of great assistance, there are sometimes reports received which are of little or no use because of the lack of essential details. There is only one correct method of reporting a VHF signal in a manner which is certain to be of some good use to the transmitter, and that is the fully detailed method as outlined herewith :—

(1) To G....., " Your signals heard on ..... at ..... GMT/BST, calling (or working) .....

(2) Local weather conditions .....

(3) Comparative strength of other stations from the same direction.

(4) Type and height of aerial used, and height of your QTH above sea-level (if known).

(5) Full details of converter and receiver in use.

(6) Whether any QRM was present on the signals, either from local or Dx stations.

(7) Details of any fading present on the signals, and if other stations were fading in a similar manner.

(8) Any other information which you consider to be of interest.

The above are the most important points to note, and all of the information can easily be condensed in a manner which can be easily understood, for instance, the following method would present a clear and useful picture to the recipient :—

To G6UH. Your signals heard on August 31st, 1952, at 1910 BST, RST569, calling G5GX. Wx, rain, temperature 67 degrees, wind NW to W, slight.

Comparative signals, G4HT (579), G3HZK (569).

Indoor Yagi, 4-element, 25ft above ground, QTH 175ft. ASL.

G2IQ converter into HRO. No QRM present, QSB to 559 at about 30-second intervals. Same conditions on other signals from your area. Other information : local gasholder at 80ft directly in line with your QTH, distance approx. $\frac{1}{4}$ mile.

That, roughly, is the way to condense a report. Such a report as this is of little use however to a station situated only a few miles away unless a particular station is asking for reports from *any* distance. On 144 Mc/s we would suggest that most stations would be glad to receive listener reports from distances over 40 miles, and on 70 cm/s, over 20 miles. (Perhaps this latter one could be modified to 10 miles or even less, because of the difficulty many stations are finding in having no local stations to contact on this band.) Regarding

the question of QSL's, please remember that the active VHF operator usually has a fairly heavy postage bill, and prefers to QSL via the RSGB, so please state whether you are a member of the RSGB on your report. (If you are not a member, it is most advisable to become one. Not only will you have the benefit of the QSL bureau, but you will be a member of the National Society, which, in spite of the mutterings which arise from time to time, is still something to be proud of.)

There are some stations, of course, who never QSL. These are in the minority, thank goodness, and we will claim that none of these exist among *our* select circle of transmitting reporters.

If you do not receive a QSL from a station to whom you have sent a report, do not write an abusive letter to him, send in the report again, tell him that it is your second one and ask if he found it of any use. Transmitting Hams are forgetful people at times, and that does not exclude your conductor ! While on the question of QSL's, G3HZK sums up the present position and says : " The more famous 2-metre stations seem to be notorious for not QSL'ing. My black list seems to agree in general with several other people's." So there is another side to the picture—the " big fellow " *knows* his signals will reach your area, so will probably not bother to reply to your report. If he does not bother to QSL for a contact, he is most unlikely to send a card to a listener. In this case it is " blow you, Jack, I'm all right," and this type has no interest in the promotion of VHF activity or in the encouragement of the listener. He comes on the air when conditions are good, gets hold of a choice Dx station and holds him in a long QSO to the exclusion of many other stations who are waiting to contact him, and finally lets go when QSB begins to set in. There is no answer to it, we can only be thankful that there are not many about like it. One shining and outstanding example to all, is EI2W. He, although knowing that his signals can now be heard in almost every corner of the British Isles, never fails to QSL a QSO *or* a listener report. This is mainly because EI2W is a true experimenter, and non-QSL'ers do not exist among these types.

Perhaps we had better stop on that note, as we appear to be straying from the main subject somewhat.

The Grounded Grid Stage Input Impedance.

Some listeners seem to be in some difficulty regarding the matching of the feeder to a GG stage. There is really no difficulty in this, and from the point of view of 144 Mc/s operation, the actual *matching* is not so important. What is important is the *coupling* of the feeder to the cathode circuit. For optimum results, the feeder should be coupled in so tightly that it is barely possible to obtain any indication of resonance on the input tuned circuit.

In most cases it is possible to dispense with the tuned circuit altogether. There is little point in using it, in any case, as the average bandwidth of the input circuit may well be in the order of 30 *megacycles* or so. The aerial itself can take the place of the input circuit, with the low impedance feeder, coupled by a small capacitance (50-100 pf) direct to the cathode, with an RF choke in series with the bias resistor preventing any loss in this direction. Don't forget to include the capacitor, because if you are using a folded dipole you will short out the bias resistor if it is omitted.

If 300-ohm line is used with a single-ended GG stage (i.e., *not* push-pull), a balance to unbalance transformer should be used, because it is incorrect to feed an unbalanced circuit with balanced feeder and the results will not be those of which the stage is capable. As a check on optimum of the aerial, substitute the feeder with a resistor of equivalent value. The noise level should go *down*, thus showing that the noise is being picked up by the aerial and not being caused by regeneration due to too loose an aerial coupling. If the noise level does increase when carrying out this test, adjust the aerial coupling, check the HT voltage and see that it is not higher than the value recommended by the makers, and make certain that no coupling is taking place between the input and output circuits of the GG stage.

As many operators are changing over to feeders of the balanced type, push-pull GG amplifiers are beginning to find more favour. Using two EC91's or a 12AT7 the input and output capacitances are halved, thus allowing for larger inductances and consequent greater efficiency. It is also much easier to couple balanced feeders into push-pull circuits. In the near future we hope to publish an article dealing with this type of GG amplifier.

News from Ireland.

Harry Wilson, EI2W, sends a copy of a circular which has been sent to all EI and GI amateurs. It announces the formation of " The VHF Research Society of Ireland." The Society will embrace VHF and UHF workers in all parts of Ireland and will have as its main object the exchange of views between members on receiving and transmitting equipment, the construction of beams and feed systems, and the collection of data on VHF propagation.

It is hoped to hold lectures in Dublin, Belfast, Cork and Londonderry in the near future, when leading VHF workers will give intending members the benefit of their experience on the Higher Frequencies. At the present time there are nine stations active

on VHF and at least twelve more are known to hold equipment.

With the increase in activity in England, there are stations active along a large part of the West Coast of England and Wales and strong signals are being received in Belfast and Dublin.

We certainly wish this venture the very best of luck, and we should like to see its activities extended to embrace the whole of the British Isles. In fact, we see no reason why this should not be done. It is only by collective action and co-operation from everyone that any useful data on VHF matters can be obtained. We therefore suggest to EI2W that a G section be incorporated in this Society for the purpose of the interchange of notes and views on VHF matters. We are willing to devote a paragraph or so each month for the publication of any notes regarding the activities of the Society if such a move is contemplated.

Station Reports.

G3WW (Wimblington, Cambs.) sends his usual fully detailed report. Once again his report shows a high level of activity with still more new stations worked. Some of the new ones were : G5VN/A, Blackpool ; G3EGW/P, Near Troutbeck, Westmorland ; G3GZM, Tenbury Wells, Worcs. ; DL3VPJ, Bielfeld (370 miles) ; DL6SV, Ahrensburg (440 miles); DL6EP, 20 km North of Bonn (328 miles) ; and OZ3WS, Vuyle.

The DL stations were worked on the night of the 24th of July. On this same night several other continental stations were worked, including PAϕRA, OZ2FR, ON4HC, and DL3QA (290 miles).

At the start of the RSGB Contest on the 26th July, the weather changed and QSB was bad from the North. Three stations were lost after coming back to 3WW's CQ but were worked again later. GDX worked during the month includes : GW8UH (160), G3CFR (154), G8DA (Gloucester, 112 miles, a difficult town to get a VHF signal into, and out of !), G4JJ/P (164), this being the third /P in Westmorland in two weeks after some years of waiting, and all three have been worked. G3AUS (214), G3BW (208), GW2ADZ (128) and G3HVO (156). Other activity in and around the Cambridge area as noted by G3WW :—

G2PU has cut down his modulation and is using a smaller modulator.

G2HCG, on holiday, was /P from the Isle of Wight, aided and abetted by G3FAN, and both had an enjoyable time, judging by the comments on the air.

G3BK has likewise been on holiday, and as usual when he is away the band is guaranteed to open. It did !

G4MW has a new 16-element stack, a nice piece of construction, which is giving great satisfaction.

G2FJR has improved his modulation.

G5UD came on the air at 1945 on the 27th, called CQ for several minutes and went back to nobody, despite desperate calls from G3WW.

G3DUP is off on holiday soon, but G3HCG is going /P in Rutland in the near future for G3FAN's benefit !

G3GGJ is determined to raise his aerial soon, and hopes then to be heard as well hearing. Perhaps this may also be the cure for G4LX.

G5JO says he has been told that his signals have been heard in GM. This is an easy feat in Cambridgeshire, but to hear Scotland or Northern Ireland when they call you is another matter entirely.

G2AIW has a son who can build VHF gear as well as his father can, what a lucky father !

G4DC can at least hear the many stations who have been calling him " ad nauseum "— he has added an RF stage (had he a mixer only before ?) ; now he is happy, and so are we.

G5UM is putting out a better 'phone signal, but says my auto sent CQ/CW T6 is with an AC ripple. Is this really so ?

There are at least five RSGB council members active on 144, G2AIW, G2WS, G5UM, G5LC and G4DC.

G3WW has worked 106 stations between the 14th and 27th of July, in 40 counties and 9 countries.

G4DC, New Cross, SE14, is back in circulation again, as may have been gathered from G3WW's report. The whole of the 2-metre gear has been rebuilt, and there are still a few bugs to iron out, but the outfit seems to be working well. The addition of a 6J6 RF stage has made quite a difference to the sensitivity. G4DC has a regular schedule with G8AO/MM and up to date has made a few Dx contacts with him. With the improvements to the gear, G4DC hopes to follow G8AO/MM all the way from the Thames to the Tyne in the near future.

Other Dx worked on the new outfit : G3DKH/P, G2IQ, G5YV, G8SB and G3EHY.

G5MR, Hythe, Kent (145.152 Mc/s) would welcome contacts, particularly between 1830 and 1930 clock time, CW preferred. In addition, G5MR would appreciate reports from *any* distance, and all reports will be acknowledged. Vernon also asks the Northern stations to look out for him. G5YV and G2IQ have been heard lately but have not been raised yet. G5MR again raises the point that the French stations are very active on 144 these days. Almost every evening, about 2030, some are to be found, and contrary to popular belief, nearly all of them worked CW as well as 'phone. Sunday

mornings is also a popular time for the Paris stations to be operating. G5MR is certain that more cross-channel contacts would be made if only the G stations would turn their beams in that direction from time to time (*and also in the Hythe direction* to give G5MR the chance of a QSO with a G station for a change !)

G5BD, Mablethorpe, Lincs., has been having beam trouble due to the gales, but has worked EI2W to give him his tenth county. GM3EGW was an S8 'phone contact on July 5th (each way). Other Dx includes DL1LB, DL3QA, ON4BZ, PE1PL, G3CYY and at long last G3ABH.

Tests are being made on the new 16-element Stackpoles Beam and it is showing great promise. It is hoped to have it installed on a new lattice tower by the end of August, so by the time this appears, G5BD will most likely be working many new stations. (We'll be looking for you, Arthur.)

G3HBW, Wembley, Middx., has found conditions only fair, and this is the first year since 1949 in which no DL stations have been heard yet. However, on July 25th, when visiting G3HXO (Shefford, Beds.), he was able to hear DL3QA and PAϕNL to remind him of old times.

EI2W has been heard at fair strength from time to time, and ON4BZ has been putting in his usual strong and consistent signal.

New stations worked over the month include : G2BAT, G2BCB, G2CD, G3GSD, G3HXJ and GW8UH. Calls heard but not worked : EI2W, F8GH, G2DUS, G3ANB, G3CC, G3EHB, G3FFV, G3GMX, G3VM, G3WW, G4MW, G5BD, G5JU, G6XX, G8IC.

G5ML, Coventry, has now worked over 100 stations on 144 but is still waiting for QSL's from 20 or more. If any station has not received a card for a contact or report from G5ML another will gladly be sent. All contacts and reports are QSL'd 100% by G5ML.

QSO's are badly needed with the following counties : Hunts., Flint, Glamorgan, Monmouth and the Isle of Wight. (What about it, G3FAN ? Fred has heard you just once.) G3EHY has been worked several times recently and the best Dx contact has been G3BW.

The 3-element Yagi aerial will soon be replaced by a 16-element all-metal stack. Tests are being carried out with the new stack at a height of 18ft and when these are complete the stack will be installed on the tower at a height of 52ft.

G3HZK, Hayes, Middx., has now rebuilt the converter and installed a 6-element stack in the roof space. The converter line-up is : 12AT7 GG Amp, 6J6 RF, 6J6 RF, Z77 Mixer, 6J6 Osc/Multi, 9001 Amp, and 6SN7 IF Amp at 26.5 Mc/s. The 12AT7 GG Amplifier is rather novel in its design, the cathode input circuit being untuned, and we hope to be able to publish some details on this in the near future. John is thinking of rebuilding the Transmitter PA to give full 25 watts input with inbuilt screen modulator.

G3AJP, Fritton, Near Great Yarmouth, found July conditions in the main unfavourable, except on the 4th when DL6SV and a DL3 were heard at S9 working inland stations. Calls from G3AJP were fruitless. GW5MQ was also heard at S9 off the back of the beam. Due to other work, 70 cm/s had to take a back seat for the time being.

But G2CPL and G4PV have been very active on this band and G3EQS, of Gorleston-on-Sea is building a 70 cm/s converter with 12AT7's so East Anglia is active enough.

G3GBO, Denham, Bucks., says he has broken one record at last. He went away on holiday and on his return was told that conditions had *not* been very good. He had expected at least a DL-SM-OZ opening during his absence ! ! The station score to date is 280 stations in 26 counties, and Don nearly got that 27th one when he heard G5BM on several evenings calling CQ at 569. In spite of repeated calls he could not be raised. New stations worked during the month include : G3CAT, G2ANT/A, G3ISA, G3HAK, G2DHV, G3IIR, G5JO, G3FSO, G3HWJ, G6FO and ON4BZ. No change has been made in the gear but the new mast has begun to take shape. The main 35ft section is up, but the top 10ft has yet to be fitted with the aerial and hoisted into position. 3GGBO is hoping for some worthwhile gain over the present 27ft aerial. Listener reports from over 50 miles North, North-West and West are particularly required and all reports will be acknowledged.

G2PU, Cambridge, has been having quite a time with the European Dx lately. From the 4th to the 10th of July the following stations were worked, all on 'phone : PAϕIKS, FP, WI, FC, EO, BAL. DL3TD, QA, 6FX, SV. ON4BZ, XB. OZ7WA, 2IZ. PE1PL, G8AO/MM, G8AO/MA.

(There certainly seems to be something strange about the Cambridge area. These boys seem to knock off the Dx like nobody's business.)

GW2ADZ, Llanymynech, Mont., has found conditions to be about average for the season, July 23rd being the one outstanding day, when the Eastern half of the country was heard having great fun with the D1, ON, PA and OZ stations. The only real Dx that trickled through was DL3QA who persisted in calling G5YV ! ! "So near to my frequency," says Bill. Conditions on 70 cm/s were also good on this same evening, and contacts were made with G2FKZ and G3EHY. G2WJ would

have been worked but for a crystal diode failure at GW2ADZ. Bill is now in search of another, anybody got one? ? GW2ADZ would like some of the London area stations to go in for something better than an 832 tripler on 70 cm/s. The only Dx station getting out beyond optical range plus 1/3rd is G3EHY. After all, says Bill, if everyone started working on 144 Mc/s with only 2 or 3 watts of RF, we wonder what results would be like. The results at GW2ADZ and also at G2FKZ, 3FZL and G5BY when signals are reasonably consistent, point to a large beam, high power and a sensitive receiver. It is no use satisfying one requirement and assuming the others to be unnecessary. 70 cm/s activity in the North is still on the upgrade, with G5YV and G5GX also the usual Lancs. stations G2JT, G2OI, G3DA, G3AOO, G3AYT and G5MQ. G2FNW is also active.

G8AO/MM (Thames to Tyne), *SS Chessington,* is now off the mark as the first sea-going amateur station licensed in this country. Two aerials are in use at the moment, a 4-element Yagi fed with 300-ohm ribbon, and a 12-element stack made of wire to eliminate much of the wind resistance. Contrary to statements published elsewhere, G8AO/MM may contact any station who calls him, and although he has fixed schedules with certain stations, he does listen over the band and will be pleased to exchange reports with *any* station.

LISTENER SECTION.

The fact that the Listener Section was entirely cut out last month was in no way due to your conductor. It was due to lack of space, and as we have stated so often in the past, we are for ever trying to influence the Editor in allowing yet more space for our VHF section as a whole. We therefore apologise to those contributors who did not see their reports in the August issue, and with our fingers crossed, hope for the best this month.

Eric Lomax, of Bolton, back into the fray again after his long absence, has found little to report except for the night of July 4th. when several PA stations were audible for the best part of an hour. These included PAϕFP, NO, NL and PE1PL. Very little was heard in the way of other Dx during this period, G6RH being the only Southern station audible. Two converters are now in use for 70 cm/s, a BC788 and a G5BY job. Nothing has been heard to date but Eric is living in hopes. The City Slicker type of aerial reduced for 70 cm/s seems so very popular in the North and some stations are obtaining very good results from it. Stations heard during June and July on 144 Mc/s : G2 AJ, ANC, AOK/A, BOC, BNZ, BPO. BVW, FCJ, FCV, FJR, FTS, FZU, HCP/P, HCG, HCP, HGR, HIF, HOP, JT, OI, PU, G3 ABH, AFY, AOO, AGS, AYT, BLP, BPO, BPJ, BW, BY, CCH, CGQ, CHY, CXD, CYN/P, DA, DH, DUP, DMU, EDD, EHY, ELT, EGW/P, GHI, GB, GMX, GSS. HCW, HII, WW. G4 HT, JJ/P, MW, SA, G5 BM, CP, DP, ML, DS, PP, VN, WP, WU, YV. G6 LC, LI, NB, NB/P, QT, RH, XM, XX. G8 DA, KL, SB. GW2ADZ, 3BOC/P, 5MQ, EI2W.

Michael Hutchins, Gloucester, has got his converter going at last and at the time of writing had heard his first station, G8DA. Michael expresses his full appreciation to local Hams for the great assistance they have given him in getting started on the band. These stations are G2HX, 3MA, 3GEN and G8DA, all of whom are active in Gloucester City, as also is G3FSL. G8BK is also becoming interested in VHF, so it looks as though there will soon be at least six active 144 Mc/s stations in this City.

Len Whitmill, of Harrow Weald, has found conditions patchy, the best days being July 20th to the 23rd, when G5YV, G3EHY and G8KL were all heard at strengths between S7 and 8.

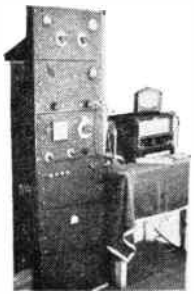
The stations heard total is now 422 in 37 counties. On 70 cm/s some alterations have been made to the converter and several new stations have been heard. Len has also changed the coupling to the 6-element Yagi and a much better match has been obtained. The strength of received signals is now about 75% of the strength of the same station on 144 Mc/s, which seems OK as he is only using a single 6J6 and 2 CV101 crystals as mixer, fed into the 640.

Stations heard on 144 Mc/s from 6th July to 3rd August : G2 AHP, AIW, AJ, AOK/A, BMI, FKZ, FVO, FZU, HCG, HDZ, LW, MI, PU, YC. G3 AEX, BCY, BLP, BPM, CAT, CGQ, CVO, CNF, CWW, ECA, EHY, ENI, FD, FSO, FUM, GBO, GHI, GSE, HAR, HCK, HSC, ISA, MI, WW. G4 DC, KD, MW, OT, RO. G5 DT, KH, LK, QL, SZ, UM, WP, YV. G6 AG, JP, LR, NB, NB/P, QN, RH, WU, XM, YP. G8AO/MA, HY, KL, OU, SB, VZ.

Ray Bastin, of Coventry, that well-known 2nd op. at G5ML, found the band in very good shape for most of July, with the best period on the 5th and 6th. The Northern stations were well heard during this time and G8IC, G8GL, G6LI, G6XX, G3CC, G3BPD, G3AOO and G2DKH/P were all particularly good signals. Local activity continues with G6YU, 6CI, G5SK and G3ABA, who, together with G5ML, keep the Coventry flag flying. In Rugby, G3BJQ is active on 144.425 Mc/s, and G3AZT on 145.100 Mc/s. Both are active most evenings.

Ray's total of stations heard is now 254 since January, 1950, and the counties score is 45.

(*Contd. on p.* 333)



AMATEUR BANDS COMMENTARY

Conducted by STANLEY HERBERT, G3ATU.

THE concensus of opinion this month is definite. All and sundry report things quiet, with lots of short skip most of the time and occasional short bursts of goodish conditions, which gave the lucky few who were on at the right time an occasional rare one.

Holidays, too, are very much in the picture at this time of the year and were this time largely responsible for most of the keen chasers missing two Dx " beauts," to which we will refer anon.

On the subject of conditions in general, it seems to us that we really have very little to grumble about, considering that we are in what must surely be the trough of the sunspot cycle.

We should'nt be a bit surprised to find things perking up nicely by next Spring—at any rate we're keeping our fingers crossed.

In the meantime, let's see what *has* been going on.

After a slight pause (on which we commented last month), Dick, of HZ1MY, has really been covering some territory. He duly appeared from 4W1MY and on the weekend of July 12th gave lots of chasers their first Yemen QSO, despite the unwelcome attentions of the same old band of cloth-eared morons, who as usual got nowhere and made a fearful noise in doing so. These characters are all suffering from that modern scourge " Dxmania Clotosis." There is only one known cure, a drastic one, involving the determined application of a quarter hammer in the shack of the sufferer, so it looks as if we'll have to put up with 'em ! Dick is now inured to their tactics and on July 26th paid another visit to FL8MY, where he was kept busy, to say the least.

On August 3rd, HZ1MY came up on CW, calling YA3MY, apparently on " sked." We couldn't hear the YA here—the skip was wrong—but lots of ZE, VQ2 and ZS stations were QSO'ing him in the early evening. The YA was operated by HZ1MY's colleague, Vic, and we presume activity was confined to one or two days. The frequency (14110), is a good one to watch at weekends and we believe August 28th will see VQ6MY active from British Somaliland. Other future activity by Dick is dealt with later in this commentary. All in all, he's in for a busy time.

Still on the subject of Afghanistan, we come to the first " beaut." He is YA3VB, operated by MI3VB, who is on 14152 kc/s, using 'phone. The rub lies in his rig, an all-battery job and strictly QRP.

He *can* be worked, though ; DL4QH, to whom we are indebted for the info, did the trick on August 5th, for the YA's second QSO, the first being an EA. QSL's may be sent via HZ1MY.

" Beaut " No. 2 is, or was, VS5ELA, who opened up from Brunei on July 27th, after months of preparation and effort. The two operators, WϕELA and ex-JA2BQ, did a tremendous job on CW, averaging something like forty QSO's an hour for most of the time. They were active for six or seven days of what must have been far from a holiday. The climate was pretty ghastly, living conditions left much to be desired and the "shack" housed thousands of bugs (the insect variety!), all of which adds up to a jaunt most of us would be delighted to pass up.

Congrats. to the pair of them.

Conditions seemed to favour the USA most of the time, but there were occasional openings to Europe. We were lucky and were able to pop in a QSO on the heels of that redoubtable Dxpert, G3AAM, who works everything that's going—nay bother at all !

Considering the size of the pile-up (almost a pile-up to end all piles-up), behaviour was good. Our demented friends, naturally, were all on parade, but didn't seem to do too much damage and we heard not a single station sit on the frequency calling " CQ VS5 " !

We're sorry so many people missed ELA, but take heart ; from VS6CG we learn that VS2CN has things organised for a trip to Sarawak. He expects to have official approval anon and will start operations in December. Then there is VS1EV, who is liable to pop up on 'phone from VS4, while we know that VS6CG himself is keen to make the trip to Labuan, even if only for a day or two. If and when he does, the frequency to watch is 14040 kc/s.

Ever heard of Fletcher Ice Island ? Neither had we, until we bumped into

W5AGB/FM, who may be heard from that remote spot (near the North Pole) on both 'phone and CW. The exact set-up is far from clear at the moment, but we gather an expedition (scientific—not Dx) is involved. Whether he will count as a new country, we wouldn't know either.

Twenty metres comes in as usual for most attention, so we start the month's reports on that band.

14 Mc/s Dx.

First, we have a short report from one of the most successful Dx workers in this or any other part of the world, GI6TK (Belfast, N.I.).

Frank has been on holiday, but sends some useful times and frequencies, gathered in the last week. He heard VS5ELA, but was unlucky with condx and couldn't make it; VS6CG was QSO'd at 1330 GMT, 14256 kc/s and others were VS2CR (1600—14093), JY1AJ (1730—14200), SU5CC (1800—14044), ET3R (1820—14056), ZC4GT (1845—14050), ZS3K (1850—14056), VS9AW (1920—14100).

'6TK comments on the patchy conditions, with early mornings generally producing nothing, which is just how we have found things here.

G3HSL (West Hartlepool) has almost completed his new rig, which will give him 150 watts from a pair of 807's. Meantime, his 25-watt CW outfit has given him three new ones, VP9OO, ZE5JP and LU7BN, with VK3KX, 3YP, MI3LK, SU1GG and SU5CC for good measure.

N. C. Smith (Petts Wood) has had his troubles this month, what with short-skip, electric storms and key clicks from a powerful local, but he still turns in some useful stuff. CW Dx: AP2K, CR7AF, DU1MB, ET3R, FB8BB, FI8AB, FR7ZA, HH3L, KG6GX, 6ABQ, KR6FK, 6IG, 6IN, KL7PI, KS6AA, PJ, UAϕKKB, UI8, VE6, 7, 8, ZD9AA, ZS7C and ZS8MK.

Phone: AP2N, CE, CR6BC, HK4DF, HZ1SF, KG4AU, OA4AM, TG9RV, VE7ASL, VP4TI, 7NT, VS1, 2, VU2BU, 2DZ and 4W1MY.

J. Whitington (Worthing) heard a couple of new ones on CW—KG6GX and LZ1KAB—making his score 34Z, 138C, with 32 and 96 confirmed.

John comments on the way KH6 and suchlike CW Dx comes through, while the 'phone band produces only Europeans. The 'phone Dx is often there, but with a band full of people who not only over-modulate but quite often shout as well, it becomes a little difficult to resolve!

'Phone *was* heard from AP2K, CE3, CR4AJ, FF8, FL8MY, HH3L, JY1BB, KG4AF, OD5, SU4CM, TA3GCN (W8GCN), TG9RB, VP4TI, VP6, VP9AU, VS6BA, ZD1SS and 4W7MY.

K. B. Ranger (Strood) is active again after three months' enforced attention to things non-radio. His station is now in an upstairs room (soundproof, too!) and he is very pleased with the results he's getting on Twenty with two 15ft wires fed into his receiver (in other words, a slightly shortened dipole). Activity at present is mostly on Ten and Twenty, which latter produced 'phone in quantity. The pick of the bunch were 4W1MY, FL8MY, MP4BBI, VQ3CH, VE8MA (S8 at 1030), fifteen VS's, CE, HC, VP5AK, VP1NT, VS6AL, KR6IB, DU, AP, VU2, VQ2DT, VQ5DQ, EQ3AL and 3A2AH, who is quite genuine.

All this was picked up on the indoor aerial into a simple O-V-1 using two PM2HL's and consuming exactly half a watt! The score this year is 34Z, 112C, which is Very Good Going.

R. Ballister (Croxley Green), also with an O-V-1, heard KG4AF, KV4BB, OD5, TI2EV, 3RC, 2TG, VP9AX, ZP and 4X4DK.

M. Lillington (Orpington) has been in Germany, where he visited DL1WP in Aachen. Since his return he pulled in HZ1TA, AP2K, JY1OG, SVϕWX, ZC4RX, MP4KAC and ZS6BW.

R. Moore (Clacton-on-Sea), with the aid of a R1116A, started listening six weeks ago. 'Phone brought him 42 countries, among which were FY8, HR1, EA8, VQ3BZ, 4W1MY, 9S4AL and W7's HIA and HGH (both around 0500).

P. M. White (Williton, Som.) writes for the first time, having been listening for three months with an O-V-2 (a converted TR9 Rx). The aerial is a 14ft whip with an 18ft lead-in and recent Dx on 'phone is CE2, 3, 5AM, FE8HS (2220), HK1HV, HP1LA, VQ4CO, PJ, YV and numerous LU and PY. P.M.W. wonders if there is activity in ZD9, and will see ZD9AA reported in these pages. However, his appearances on 'phone are few and far between. Around 14028 kc/s is where to catch him, on CW.

P. Hunt (Ellistown) offers the results of one week's 'phone listening, using a BC312: 4W1MY, JY, CM9AA, VQ2DT, 3CP, 5DQ, OX3, lots of S. Americans and CR1S (EH??).

R. Goodman (Edgware) finds his O-V-O is still adequate for pulling in the Dx. He tells us of 'phone from CO2BK, CE3CZ, HP, HC1FG, KG4, KL7AFR, OX, VP3LF, VP4TI, VQ4, 5, SU5EB, ZD4BF, ZP, YV and WY and 7.

P. M. Crawford (Darlington) has been making full use of the pipe-line which must exist between his station and the Pacific. Witness the following CW. VR2AA (14120), KJ6AP (14070), KJ6AAH (14125), KR6CP, 6EK (14025), KX6AB (14075), JA2FM, 2XE,

8OM, ZM6AK, ZK1AB, FR7ZA (all early morning stuff), VS6CB, DU1DO, HH3L, FG7XA and CP5AK. Almost worth getting up early, isn't it ?

Martin doesn't think much of the 'phone situation of late, but was pleased to hear KR6IB at 1940, competing with the usual short skip. Other Dx : CX2CO, OQ5, FL8MY, 4W1MY, AP2L, HZ1, SU5EB, etc.

He mentions the deplorable performance which accompanies HZ1MY on his travels and wonders how Dick manages to work anyone through the racket.

Re our remarks on people sending "morse" with their feet, P.M.C. suggests they may be wearing clogs too ! He mentions activity by two W2's, working from St. Pierre and Miquelon with the call FP8AK.

We know, too, that FP8AP, active on both 'phone and CW, is a native of the Islands, so there should now be no difficulty in seizing hold of that little country.

D. L. McLean (Yeovil) found 1700-2100 to be the best time for Dx, despite the European skip. A comprehensive 'phone list mentions AP2K (14109—1755), AP2N (14148 — 1755), CR6AT (14291 — 1900), CR6BW, 6BX, DL4JJ/AM, FL8MY, HB9GX/MM (*SS. General Guison*), HH3L (14150—2216), four HZ1's, KW6BD (14209—0730), seven OD's, VE8MA, VP3LF, 5AK, 5AR, VQ2 and 3, six VQ4's, VS1DQ (14210—1610), 2CR (14200—2236), VS7LB (14238—1918), 7SP, 7WA, VU2BH (14215—1620), ZD1SS (14315 — 2240), ZD2TTE (14215 — 1140), ZD4's, ZD9AA (14123 — 1850), ZE2JU, 4W1MY.

HZ1MY was heard to say he intended a trip to Bahrein Is. and also to another spot (name missed) where he would use the call-sign 6L6MY (we *knew* it was only a matter of time before *that* one burst upon a startled world ').

G3CMH (Yeovil Amateur Radio Club) worked EA9AT, PY4EJ, SU5EB, TA2VDR, ZD2TTE and ZB2A on 'phone and SU3JQ, plus several W's were hooked on the key.

C. R. Johns (Bournemouth) provides some further useful information on the projected ZD7 Expedition. The dope, via ZS6BW, W5ASG and a W8-SWL friend of C.R.J.'s, specifies the start as being Sept. 23rd. The " gang " intend to stay for two months (*that* should ease the panic, one would think !) and the whole thing is being organised by the ZS boys.

C.R.J. has a letter from GM2DBX, whose 'phone Dx is considerably more than somewhat ! DBX says he has to use candles to heat his filaments. (Wonder what brand he uses ? We could do with a reduced electricity bill ourselves !).

Holidays are in progress at Bournemouth too, but CO2BL, 2BW, CM9AA, EA6AR, HZ1AB, 2TA, TA, PY, VQ4 and ZC6UNJ were snagged on the O-V-1. A list of FK QTH's is given later in these pages.

C. J. Goddard (Warwick) is welcomed back on his demob. from the Army. The last nine months of National Service were spent in Cyprus and John spent quite a few hours with ZC4RD.

A new shack, receiver and aerial system are planned, so when conditions improve C.J.G. should start hearing the rare ones. In the meantime, four days' listening produced CN2AS, OQ5RA (14030—14040), TF3AB (14040), JY1AJ and ZB2A on the key, with 'phone from N. Africa.

W. Hardie (Hawick) is also welcomed back, having completed *his* National Service with the R.A.F. He has acquired an S640 with which he is very pleased, and a 70ft aerial with which he isn't !

Listening is mostly in the evenings and was responsible for 4W1MY, CE, CS1WB, CX2CL, FB8BB, FN8AD, HZ1, JY1OG, K5AIR, KL7ADR, MP4BBH (Bahrein), SU1AS, 4EB, VP6, W7ERO, 7DL, YI3BZL and ZC6UNJ, who is awarded the consistency " biscuit."

Bill tells us that SU1AS (Cairo) is operated by Ahmed, a young man of eighty-five ! Another item of interest came from VQ4AA, who was heard to tell a G6 that snow was falling at the '4AA QTH—8,000ft above sea-level and smack on the Equator.

B. J. C. Brown (Derby) has also been on holiday, but he sends the results of his labours, prior to pushing off.

Twenty was moderately good and provided two new countries, AP2K and 4W1MY. VP3HAG turned up again after a long absence and others were CO2OZ, KV4BB, OA4CH, VE7AFL, VP6, VQ2, 3, 5, VS7LB, YV1AP, ZP5 and ZS6BW.

Our own efforts produced the following odds and ends. VP5BF (Turks Is.) (14062—2330), FP8AI (0800—St. Pierre must be getting a trifle overcrowded by now !), PZ1AL (14080—2300), YK1AH (14032—1300), PF1TL, who is in Holland, despite the rather odd call-sign and the character signing " 2Z2AA " who admits to all and sundry his unlicensed status. All the above used morse.

Several KA's have been heard and we believe them to be Japanese nationals.

FI8AC (Saigon) often puts a strong 'phone signal through around 1700—14162.

The Fourteen Metre Band.

Is providing spasmodic activity, weekends especially giving a big boost to the present rather limited band occupancy ; limited, that is, compared with, say, Twenty. Indeed, one listener admits he has been so far unable to find the band ! To help him and any

others in the same fix, we suggest looking for two strong commercials, FZT7, on 21030, and OLU, who is as near 21000 kc/s as makes no difference.

G2VV (Sunbury-on-Thames) found the band all right—he's been operating on 21 Mc/s exclusively since July 2nd and has done well, working seventeen countries in three continents with a 28 watt Tx and a 136ft aerial. Two Vic. Vic. mentions OZ, EA, 9S4, 5A2, YU, I1, FA8, FF8, ZC4, KP4 and W4 and 8. Heard were ZS, PY, ZE and VQ4.

He comments on the erratic Dx behaviour of the band, with stations popping up and disappearing again in a matter of minutes.

N. C. Smith's efforts resulted in the unearthing on 'phone of FQ8AG, OQ5HL and ZD9AA. CW: FA8CR, FF8AG, JY1OG (now QRT), KP4CC, OA4C, PY, VQ4, W1BSY, 2WZ, ZD6DU, ZE3JP, ZS1FD, 6BT, 6TE and 5A2CF.

B. J. C. Brown heard YV5AB, a good 'phone catch.

D. L. McLean also got the YV5 and CX1IW, HZ1MY, OQ5 and PY.

G3CMH worked PY's 1DA, 2AQ and 2CK.

John Whitington offers LU8EE on the key and some short skip on 'phone.

Other Bands.

Quite varied activity is evident on the remaining bands, even Ten comes in for a certain amount of comment, not all of it rude, either !

K. B. Ranger succeeded in wringing out some respectable Dx, with CR6BX providing the most consistent signal, followed by CE3LE, 3LB, 3NC, CX4CS, MI3NA, OQ5VD, VQ2DT, W3EU/MM (off Mombasa) and lots of short skip, EI, OK, SM and EA9 being new ones for him.

D. L. McLean, listening between 1800-2000, picked up CR6BX, CX2BC, 4CS, LU4DMG, 7AJ, OQ5, PY, SU1AB, VQ4BP and W8MY/P (Med.).

N. C. Smith continues to make Forty Metres pay dividends. 'Phone was heard from CO8CC and HC1OU. On CW, Norman really dug deep and came up with CM2FC, 7PT, CO2OK, CE3BM, FP8AM (gosh, another one !), K5FBB, LU8EE, OY3IGO, TI2TG, UG6, UA9KCA, KCC, VK2AX, 2ST, 3AP, 3ZO, 5MZ, W5TQO, XE1KB, YV6AO, ZS6J, 4X4DI and ZL's 1ACP, 1HM, 2GS, 2GX, 2IC, 2IQ, 2KX, 3FQ, 3JQ, 4DU, 4FM, 4GA, 4CK.

There's Dx there lots of us wouldn't mind hearing on Twenty and anyone wanting ZL now knows where to set about looking.

Norman found Eighty disappointing, but heard OY3PF, KP4ON, VE1FR, W3SSC, 4ABK, 8WZ and no less than thirteen WN's.

His score for 1952 now stands at 39Z—183C, with 14Z and 41C on Fourteen Metres.

Ron Goodman, on his O-V-O receiver, picked a good morning on Eighty, around 0420, and heard W1CMC, W2OCD, 3HA, 3GKD, 3QAN and 8EAN. He amends his score to 35Z and 122C, having been counting W1, 2, VE1, 2, etc., as separate countries. He did the same with G, GM, GW, GC, GI, but there, at any rate, he is perfectly in order. They all count towards DXCC and every other important award.

GC2CNC (Jersey, C.I.) comes forward with details of the QRP Group Contest. This is a long-term affair, covering twelve months and is confined to transmitters with an input not exceeding Two Watts ! The object is to work 200 counties on the three LF bands, 1.8, 3.5 and 7 Mc/s, with a minimum of 50 on each band. Sounds good fun. The Group will award a certificate to anyone—member or not—who produces the necessary proof.

Monty's score to date is 145 and he is chasing lots of "rare" counties. For instance, GM and GW contacts are welcome on any of the bands, as are GI's on Top Band, so all who could do with GC, take note. Don't expect an S9 signal, though; 'CNC uses less than two watts as a rule.

VQ4DO's remarks on bad ops. brings agreement from Monty, who used to work ZC1CL regularly and was bombarded with rudery by sundry W's, who accused him of holding the QSO too long. The fact that both stations were on the air for the very purpose of having a long chat, apparently didn't mean a thing to the "new country at any price" gang.

U. Kvick (Kristinehamn, Sweden) continued his Top Band vigil, but found July a bad month, due to terrific QRN. Many hours were spent listening to crackles and bangs only ! Ullmar is obviously very keen and now has 9 countries and 40 counties.

New CW stations were G2HW/A, 2AJU, 2CZU, 2BFQ, 2WI, 3EIW, 3GW/A, 3DYQ, 3JT, 3BCM, 3GZB, 3HVE, 3GKQ and G8QZ, and on 'phone, G6WF. Ullmar stresses the fact that, although his main interest is the Top Band, he *does* dabble a little in HF work. For instance, he heard ZS2HI (0300) on Eighty, while Twenty 'phone includes such good Dx as 4W1MY, AP2K, CT3AF, CE3CZ, I5SG, 5XU, JY1OG and VE8MA (Ellesmere Is.).

He heard ZA1BZ on 7 Mc/s, but fears the worst. We agree and would say the same about ZA3KAA, heard recently on Twenty.

Late Flash—Afghanistan.

Our worthy Editor, G2UK, comes up with some timely information. YA5XY will be active within the next week or so. He may well be on as you read this and will use Twenty 'phone, operating chiefly late after-

noon and evenings. He is JY1XY, who has been operating from OD5AB. QSL via RSGB or to OD5AB.

Dx QTH's.

FK8AL.	Jean Gabe, 26, QL, Noumea, New Caledonia.
FK8AH.	Robert Gabe, 26, QL, Noumea, N.C.
FK8AM.	F. Cousin, Anse-Vata, N.C.
FK8AN.	G. Cointet, Electric Radio, Noumea, N.C.
KR6IB.	APO 239, P.M. San Francisco, Cal., U.S.A.
OA4BC.	USAF Mission to Peru, c/o U.S. Embassy, Lima.
TA2VDR.	via ARRL.
TA3GCN.	APO 206A, P.M. New York, N.Y.
VQ5CY.	Box 12, Kampala, Uganda.
VQ5DQ.	Box 391, Kampala.
ZC6UNJ.	APO 206B, P.M. New York, N.Y.

The deadline is a little earlier than usual, this time. Please send your reports and comments to Roker House, South Cliff, Roker, Sunderland, to arrive not later than September 3rd.

Good hunting, 73.

Workshop Practice. (*Contd. from p.* 328)

THE SCRIBER AND CENTRE PUNCH—

THE scriber is the name of the tool used to mark out lines on the work to be cut or set out. It can very easily be made from any thin piece of tool, or silver steel, ground to a long tapering point on the grindstone in the shack.

A rule should first be laid across the work, the scriber point placed at the edge of the rule and then drawn smoothly across. It must not rest against the top edge of the rule, as the line will then be marked away from the lower edge and in consequence any alteration of the angle will produce a wavy line.

The Centre Punch.

This is the " big brother " of the scriber made out of much heavier tool or silver steel, but ground to a short point with a 60 degree angle for general work. In the grinding of both the punch and scriber, grind on the face of the Emery wheel so as the grinding lines run away from the point and not across it. In the case of the centre punch the latter produces a weak point and the ridges resist penetration.

When using a centre punch incline it to the work so as the location of the point is visible. Then bring the punch to the vertical before striking with the hammer. Striking at the inclined position will affect the original setting position.

Dx Countries. (*Contd. from p.* 327)

were given the impression, which lasted until the end of the War, that their mission had been successful.

The War brought many changes to the Islands including a 2,000-yard airstrip. Unfortunately, today, the population has increased out of all proportion to its resources. Evacuation of several hundreds of inhabitants is essential for the well-being of those allowed to remain. The economic plight of the Islands has spelt doom to the independence of this erstwhile paradise.

BACK NUMBERS.

Back numbers containing the following constructional articles are still available at 1/9 per copy.

The Selectoject, by Evert Kaleveld, PAϕXE. 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 Mc/s, by F. W. Hattemore. 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, PAϕXE. August, 1952.

Club Notes. (*Contd. from p.* 345)

Course will be held on Tuesdays from 7 to 9 p.m., commencing Tuesday, 16th September. Enrolment for both courses can be made during the week preceding the commencement of the classes or at the classes themselves. The instructor will be Mr. J. V. Hamilton of EMI.

CLUB NOTES

Club Secretaries are invited to submit notes for this feature by September 16th.

Stourbridge and District Amateur Radio Society. Hon. Sec.: F. W. Meredith, 26, Gilbanks Road, Wollaston, Stourbridge.

At a recent meeting a talk and demonstration was given by Mr. Sims of the BBC Engineering College, Evesham. A VHF transmitter on 170 Mc/s was used for the demonstration and the results from various aerials was really amazing, in particular a 4-wave aerial was fitted with a disc and the radiation pattern was completely changed.

Mr. Sims ended his talk with some lantern slides of the aerials at Brookmans Park and Sutton Coldfield.

The lecture on September 2nd will be "Nuclear Fission" by Mr. J. Timbrell (G6OI).

Wirrall Amateur Radio Society. Hon. Sec.: A. H. Watts, G3FXC, 9, Coronation Drive, Bromborough, Cheshire.

Recent talks have included one by Mr. Harry Caunce, G6KS, of Liverpool, on Police Radio, and by Mr. J. Swinnerton, G2YS, of Chester, on Troubles with a Tape Recorder. A successful Junk Sale, at which £14 changed hands, was another feature. Other events included a DF contest on July 27, and a Quiz Night on August 6. The Junior Section, under the guidance of G3CSG, G3ERG and G3IIH, continues to flourish, and activities there are, of course, concentrated on the receiving angle.

Meetings are held twice monthly at the YMCA, Whetstone Lane, Birkenhead, Cheshire; the next being on Sept. 10th and 24th.

East Surrey Radio Club. Hon. Sec.: L. G. Knight, G5LK, Radiohme, 6, Madeira Walk, Reigate, Surrey.

The July meeting of the East Surrey Radio Club was held in the Club HQ on Thursday, July 7th, when the Chairman, Mr. David Ferguson (G3DBJ) gave an informal lecture on "The Eddystone Range of Communication Receivers." At the next meeting, which was on Thursday, August 7th, at 7.30, Mr. Dennis Lloyd demonstrated and lectured on "Magnetic Tape Recording."

A Club transmitter is in the process of being assembled and a licence has been applied for.

It is hoped to arrange weekly sessions for morse practice and a weekly session when the transmitter will be on the air. All newcomers will be made very welcome.

East Grinstead and District Amateur Radio Club. Hon. Sec.: F. J. Glynn, G3GVZ, The Mount, 13, Station Road, East Grinstead.

The Club now meets on alternate Thursdays at Portland Hall, Portland Road. Dates of the next two meetings are Sept. 11th and 25th, when new members will be welcomed. Schemes for raising funds are wanted, and in this direction, it is proposed to hold a Jumble Sale in the near future. Good jumble (not junk !) will be welcome, and collection can be arranged.

Hounslow and District Radio Society. Hon. Sec.: J. Clarke, 124, Springwell Road, Heston, Middlesex.

Recent meetings have included talks on matching aerials to feeders, and an explanation of the questions set in the City and Guilds Amateur Radio Examination.

No meetings were held in August; the next being on 11th and 25th September, when a demonstration will be staged with a Tx showing how to detect standing waves together with an explanation of how they occur and how the standing wave ratio may be improved.

Warrington and District Radio Society. Hon. Sec.: S. Woods (G3EZX), 12, Thelwall Lane, Latchford, Warrington.

Recent activities have included a social outing for members and their families to the North Wales coast, a lecture on valve types for Two Metre work, by Mr. G. Leigh (G2FCV), and the normal business and "rag chew" meetings held at the King's Head Hotel, Warrington, on the first and third Tuesdays of each month.

Persons desirous of joining in the activities of the Society are cordially invited to contact the Hon. Sec. or any member.

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

A recent lecture on Nuclear Physics was well attended. At the next meeting, on September 12th, the subject will be "Cathode Ray Oscilloscopes," followed on September 26th by a lecture of particular interest to transmitting amateurs, "Two Metre Equipment," by Mr. J. N. Walker, G5JU.

This year, on October 2nd, 3rd and 4th, "Slade," in conjunction with the Midland Amateur Radio Society, will be participating in an Exhibition held by the Sutton Coldfield and North Birmingham Model Engineering Society, at the Church House, High Street, Erdington, Birmingham. It is hoped to have a wide range of amateur equipment on display, in addition an amateur radio station will be operated at the Exhibition. Visitors will be very welcome at any meeting. These are held at the Church House, High Street, Erdington, Birmingham, on alternate Fridays, commencing at 7.45 p.m. Further details may be obtained from the Hon. Sec.

Wrekin Amateur Radio Society. Hon. Sec.: J. C. Tranter, G3BQQ, 78, New Street, Wellington, Shropshire.

Members of the Society recently entertained PAØKC, G3CU and G3CWC, all SSB exponents. Jan (PAØKC), who is on a tour

of Gt. Britain, stayed several days with G3FHL. During his stay a visit was paid to the GPO station at Criggan to inspect the SSB equipment there under the guidance of G4LU.

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

The Club continues to meet monthly on the fourth Thursday of the month at 7.30 p.m. at the Railway Hotel, Purley. At the last meeting, E. R. Radford, G2IM, gave a talk on " 25 years of Amateur Radio," in which he related some of his interesting experiences during and since the first World War.

Arrangements have been made for two parties of members to visit the BBC Receiving Station at Tatsfield, on October 12th and 19th respectively. Anyone wishing to join either of the parties should contact the Secretary as soon as possible.

On Saturday, October 11th, at the Railway Hotel, we are holding a social and entertainment at which refreshments (ham sandwiches, coffee, etc.), will be provided. It is hoped the occasion will provide an opportunity for members to bring along their YL's, XYL's and families and have a really enjoyable evening. It is the first time the Club have held anything of this sort and whether it is repeated will depend upon the support we receive. Tickets will be 5/- each and can be obtained from the Secretary.

The next Meeting of the Club will take place on September 25th when we shall be very pleased to see any new members or visitors.

RADIO AMATEURS' EXAMINATION COURSES.

For the first time, Chichester is to have a City and Guilds Radio Amateurs' Course. It will be held on Wednesdays, 6.30-8.30 p.m., at **The Chichester Evening Institute,** Lancastrian Boys' School, Orchard Street. Commencing date, Wednesday, 17th September. Fee is 10/- and enrolment is on Monday and Tuesday, 15th and 16th September, or at the classes after they have commenced. The City and Guilds Examination is not held until May, but it is expected that the class will continue with advanced work into the summer term. The Principal of the Institute is Mr. D. Hanson, and Mr. E. J. Pearcey, G2JU, late of the EMI Group, is the lecturer.

The Brentford Evening Institute, Boston Manor Road, Brentford, Principal, Mr. G. V. Mills, will also be holding a course for the Radio Amateurs' Examination again this year commencing September 17th and every subsequent Wednesday from 7 to 9 p.m. In addition, the City and Guilds Radio Service

(*Contd. on p.* 343)

FROM OUR MAILBAG

Dear Sir,

Reference to the article in this month's " Radio Amateur " entitled " The QSL Problem."

I would like to put forward two views and suggestions :—

(1) That the proposed new SWL veri cards be introduced on a pre-arranged system, i.e. published lists of stations who cannot QSL in the normal manner due to cost, etc., but who would be prepared to verify on a card such as that suggested. At the same time, publish lists of stations who will not verify under any circumstances, thereby saving time and expense in reporting.

(2) A suggestion that the printers of QSL cards produce the same designs as used for transmitting QSL's on a thin type of paper for replying to reports and QSO's, thereby saving expense. The SWL could paste these on to his own cardboard if he wished. I personally think if the latter suggestion be brought into use, the need for the new SWL card would be ruled out as surely all desire a QSL to be proud of. In my opinion, should the new card be introduced and " catch on " the glamour of QSLing will be gone and the numbers of SWLers will gradually diminish. Carry on as at present, but make reports worthy of a QSL card.

G. Vials,
Market Harborough.

Dear OM,

It is high time something was done to the " spivs " of QSLing. I cannot see one good point in its favour. A QSL card is a verification of reception either by a SWL or transmitter and is a source of some skill and helps to give the transmitter some gen on his efforts —we hope ! A very useful list of solicited QSL's may be found in one of your contempories. In future we will swop a dozen eggs for a dozen QSL's and get to the top of the ladder with 500 countries—hi ! One may even get the cards without even ever listening on the bands ! Please cut out the useless black market gang. As I do not often write in protest I would like the gestapo to come down on the heads of these spivs and racketeers.

All this boils down to show how useless the practice of swopping cards is. I cannot see any point in it and it is likely to stop any HAM bothering to answer a genuine report.

73's,

J. S. Bollard,
Chester.

LONDON AMATEUR RADIO CLASSES

THE following classes, organised by the East London RSGB Group in conjunction with the Essex County Council, are available for all those interested in Amateur Radio, irrespective of whether they are members of any Society or of the general public.

(1) **Radio Amateurs' Examination Course.**
Wednesdays, 7.15 p.m.—9.15 p.m. Eight-month course for those intending to take the examination.

(2) **Morse and Codes of Practice.**
Monday, 7.15 p.m.—9.15 p.m. Three to six-month course for those who wish to learn morse up to the GPO requirements for an amateur transmitting licence. Arrangements have been made with the GPO for those who in the opinion of the masters, have reached the required speed to be tested in groups at the College in the evenings by an examiner of the Post Office, thus eliminating the nervous tension involved in taking the test in unfamiliar surroundings.

(3) **Amateur Radio Refresher Course.**
Tuesday, 7.15 p.m.—9.15 p.m. Six-month course for those who have passed the RAE and are newly licensed. Also for other amateurs who are desirous of accumulating knowledge. Covering the design, construction and theory of VFO's, low power transmitters, frequency meters and frequency measuring equipment and antenna design with practical demonstrations.

Venue for the above classes :—
Ilford Literary Institute,
(High School for Girls),
Cranbrook Road,
Ilford, Essex.

Adjacent to Gants Hill Station on the Central London Tube. The fee for any of these courses is 10/- to students resident in the Essex Area. Others living in other parts of London will be admitted as out-County Students provided the Local Authority is notified.

Enrolment evenings Sept. 8th/12th, 7 p.m. —8.30 p.m.

This is an excellent opportunity for London amateurs to gain sound knowledge of their hobby and it is hoped that many will take advantage of it and fill the classes. Twenty-three out of twenty-eight students were successful in passing this year's C. and G. Examination and eighteen out of twenty-three satisfactorily passed the GPO morse test.

BOOK REVIEW

PRINCIPLES OF RADIO (Sixth Edition), by K. Henney, B.A., M.A.; and Glen A. Richardson, B.S., M.S. 655 pages, over 400 illustrations. Price 44s. Published by Messrs. Chapman & Hall, Ltd., 37, Essex Street, London, W.C.2.

The preparation and publication of a reference book that embraces almost all aspects of radio communication theory and presents such a wide subject in clear and understandable language is, undoubtedly, an ambition to which many an author has aspired. In this volume the co-authors have succeeded to a large degree, and are to be commended for their very adequate treatment of basic principles without introducing difficult mathematics; their method will surely appeal to the vast majority of students who do not like to be tortured with heiroglyphical hidrosis.

About one-third of the book is taken up by the first nine chapters, in which the reader is gently but firmly educated in those important fundamentals, magnetism, inductance, capacitance, properties of AC and DC circuits, resonance, and kindred subjects. The next seven chapters deal with thermionic valves and their application as detectors, amplifiers and oscillators. From this section of the book the reader can seek and find practically all he needs to know on such matters, and is given sound knowledge on the interpretation of characteristic curves, audio curves, audio design, rectifier and power supply apparatus and receiver practice.

There follows some discussion on amplitude-modulated transmitters, transmission lines, aerials and propagation, frequency modulation and detection. The chapter on ultra-high frequency phenomena introduces the reader to the complex problems of the technique, and gives up-to-date information on such things as lighthouse triodes, klystrons and magnetrons, cavity resonators and wave guides.

A chapter on electronic measuring apparatus is devoted to valve-voltmeters, cathode-ray oscilloscopes and Q-meters. A rather short section deals with wave-shaping circuits and multivibrators, and a brief chapter on television principles presents a rough idea of the fundamentals of this branch of electronics. The book concludes with a small chapter giving the basic conception of radar.

This publication represents good value and can be recommended to those who want to secure a good grounding in essential theory; it forms an admirable introduction to more serious study. It is liberally sprinkled with some 250 problems intended to enable the reader to obtain practice in solving typical design formulae, but as the answers to the questions are not given the student will not be able to check his working. As the book is of American origin, English readers will expect to notice many terms and phrases which at first will be unfamiliar, but these are easily reconciled with the English terms. The type-face and diagrams are particularly clear, and the book is notably free from errors. A useful index, and the sectionalized chapters, are also pleasing features.

Mains Trans. Design. (*Contd. from p.* 314)

ordinary enamel, whilst for thicker wires such as are used for heater windings, the cotton and enamel-cotton coverings give a factor of safety, since ordinary enamel might crack where the wire takes sharp bends. A cotton-covered wire is also easier to handle in winding if the wire is thick.

Method of Winding.

Before going on to the calculations necessary to design the coils, let us consider for a moment how we shall wind them, and why. A little contemplation will make it clear that if the wire is wound on anyhow we shall probably finish up with a horrible-looking coil, and stand a good chance of having to wind it again when we find that we can't get all the turns in the space available. No self-respecting constructor would deliberately make a rough job of a coil, although one must appreciate that patience might easily become strained when winding a coil with several thousand turns of fine wire—the tendency is then to hurry through the business by letting the wire run on in random fashion rather than guide it on in evenly-wound layers. Until one finds the knack of doing this when winding by hand, there is a great temptation to relax one's concentration, with consequent uneven layers, a spongy coil, and a general appearance of poor workmanship. A nicely-wound coil will look good; it will be hard and firm when pressed with the fingers, and it won't sing and buss in operation.

The object should be to wind each layer with the turns touching each other. This is not always easy to accomplish; thick wires tend to "spring" and leave gaps between the turns, so some mild form of BF & BI (brute force and . . ! x : ! ignorance) is sometimes necessary when handling wires of 18 SWG and thicker. Gauges 20 to 36 SWG come within the range of easy-to-handle wires, and can usually be persuaded to run on evenly without much trouble. Wires thinner than these tend to want to have things their way instead of yours, and the thinner they are the more they wander. They also have a nasty habit of breaking at the most inconvenient moment, so don't wind such wires unless the children are safely in bed and asleep, otherwise the young innocents will acquire your vocabulary of cuss-words. Fine wires play havoc with one's patience on rectangular coils—they try to go anywhere but where you want them to be.

With hand-winding, it is hardly to be expected that the precision of machine-wound coils can be achieved, for inevitably there will be slight spacing between adjacent turns. One has to make allowance for this in calculating the number of turns that can be wound to each layer, for it is seldom that the "turns-per-inch" figure given in wire tables can be obtained in practice. In the wire tables I have compiled for this article, the turns per inch figure has been reduced by a small amount for each size of wire. These figures are based upon a "spacing factor" which experience has shown to be a reasonable estimate of the space lost in hand winding.

When a coil is wound layer by layer, a far better winding is obtained if thin paper is put over each layer before the next one is wound. This serves two purposes; the paper provides a more even base upon which to wind the wire, but more important is the insulation it gives us between layers. The voltage gradient between layers is highest where the end turn of one layer lies under the end turn of the layer above. The paper supplements the insulation at these points. By making the layer length slightly less than the width of the paper, end turns are prevented from slipping down to the layer or layers below.

The paper insulation can be good quality clean tissue about 0.001 in. (1-mil) thick. One turn is sufficient for gauges 32 SWG or finer, with two turns for gauges 20-32 SWG. Wires thicker than 20 SWG will require three or more turns of paper. Insulation between windings can be several turns of paper, say 8 or 10, though for preference Empire tape or cloth cut to the required width should be used. Two turns of 5-mil Empire tape is usually sufficient, but three or more turns may be required if voltage differences between windings are high. As a rough guide, allow one turn 5-mil Empire tape for every 300V, and add one turn for safety.

Solution to Last Month's Crossword.

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