

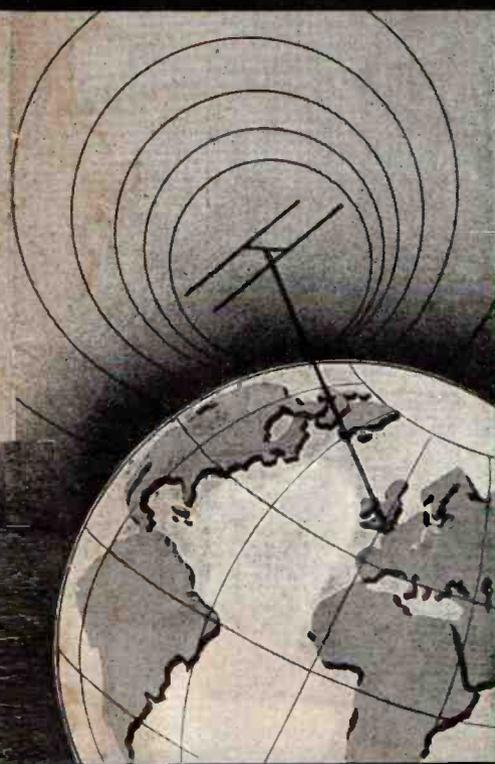
Short Wave News

1/3

Vol. 3 No. 10

Oct., 1948

For Transmitter and Listener



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Short Wave News

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October, 1948

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YOU'VE had it! The "summer" we mean. Which all goes to show that before we know where we are winter—or more appropriately The Season—will be upon us. This is the time of year when constructors dust off the bench and clean and sharpen tools in preparation for the winters orgy of construction; when the DX gang get down to more intensive work and get even more excited over new catches; when club secretaries report a greater attendance at meetings. All this exemplifies The Season. When you read these lines it will be on!

These words introduced the Editorial in the October *Radio Constructor* but we felt they were worth repeating as a suitable intro for another train of thought for *Short Wave News* readers. Besides all the good things associated with The Season, we have another factor to contend with this year, and quite likely for several years. It is the new bogey—Power Cuts. To the average ham, power cuts usually mean one thing—QRT. During these periods of "no juice" perhaps the opportunity is presented in which to do some of those odd jobs around the shack that never seem to get done. Or perhaps one could do the paper work on the details for that super gear you will build one day?

We need not, however, go QRT. One can always operate battery gear. How many readers, normally using mains equipment, have stand-by battery receivers and transmitters ready for immediate use? Probably not many! So why not get going now on that gear so that you can snap your fingers at any Power Cut? You will not get so much RF from your TX or so much punch from your RX—but after all is that really so disastrous? Not on your life!

Viewed from a moral angle, perhaps the power cuts will be a blessing in disguise. If some of the "commercial type" transmitters were forced to try QRP maybe they would learn quite a lot of new angles in ham radio. They would also doubtless see that brute force and ignorance is not the only way to work DX! And again, they would then realise and understand the difficulties that are part and parcel of many hams daily routine—hams who cannot afford lavish streamlined stations or who simply prefer to get the maximum efficiency from the minimum of gear.

EDITORIAL

THE "SEASON" OPENS

Try QRP during this
winter's power
cuts

The average ham also, who has never tried real QRP (we do not call 25 watts QRP as many seem to!), may well be pleasantly surprised at what can be accomplished with just a few watts. If you are in doubt as to the possibilities of QRP work, you have only to read through 2SO's QRP Notes, they speak for themselves.

So, do not despair if we get frequent and lengthy mains cessations this winter. Have a shot at some QRP work—you will not be sorry!
W.N.S.

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

COMPONENT REVIEW. Manufacturers, publishers, etc., are invited to submit samples or information of new products for review in this section.

CHEQUES and Postal Orders to be made payable to "Amalgamated Short Wave Press Ltd."

ALL CORRESPONDENCE should be addressed to "Short Wave News," 57 Maida Vale, Paddington, London, W.9. Telephone CUN. 6579.

Quarterly DX Prediction

(OCTOBER TO NOVEMBER, 1948)

Compiled by the Leicester Tele-communications Laboratory,
Leicester, England

FOR the purpose of these predictions it should be noted that the four major communication circuits are used extending to (a) North America, (b) South America, (c) South Africa and (d) Australia. Reference to the Great Circle Map centred on London will show that the Australian circuit covers Asia and Japan. It should be understood that to forecast these communication circuits for a period as long as three months the data given is liable to slight errors, particularly in relation to the "disturbed periods."

The Preceding Period :

As is usual at this time of the year, the maximum usable frequencies (average) show a decrease during the months of June and July, and during July the m.u.f.'s were about the same during the day-time and night-time periods.

Communication was maintained during the late afternoon period on circuit (b) using a frequency of 28 Mcs. almost every day during the period extending from the middle of July until August (fourth week). During the early part of Sept. communication has been infrequently reported on the same frequency at 14:00 (GMT) on circuits (a) and (c). Circuit (d) has been "open" daily at 09:00 hrs. (GMT) using the frequency of 14 Mcs. The "disturbed periods" were fairly infrequent and only one or two severe storms have been recorded.

During this period the 58 Mcs. band was observed as being very active and a large number of DX contacts due to Tropospheric propagation have been recorded, several of these being over a distance greater than 1,000 miles. Several Italian stations and one South African Station have been heard by our monitoring staff.

Prediction for October :

The daytime m.u.f.'s will now be on the increase and those of the night period on the decrease, which means that all circuits should be usable on frequencies up to 28 Mcs. Early morning communication should be reliable on circuit (d) on 14 Mcs. whilst during the period commencing at noon and ending at dusk the (a) and (c) circuits should present no difficulty on frequencies up to 28 Mcs. Long distance communication on 7 Mcs. should commence during the early hours of the morning, extending nearer to midnight as the month increases.

October is more or less free from severe ionospheric storms, but there might be a serious storm around the 28th. Minor storms will occur during the 1st, 3rd and 4th weeks of the month, but these will not cause any great trouble, except perhaps a few "freak" results on the high frequencies.

Prediction for November :

It is usual, in accordance with the normal seasonal changes, for the m.u.f.'s to increase during the daytime and those of the night period to decrease, leading up to the "mid-winter effect." The high frequency circuits should be usable up to the late afternoon and even though we have passed the Sun-spot maximum, it should still be possible to use the 58 Mcs. band for "spasmodic" DX communication. The B.B.C. television frequencies should be watched during this month (i.e. 41 Mcs. channel) as an indication of the increase of the m.u.f.'s.

All circuits should be "open" for reliable communication on 28 Mcs. and on add days there may be a slight interruption due to minor ionospheric storms, but these are not expected to be very severe. The 1st, 3rd and 4th weeks of the months will most likely be the dates during which these storms will occur.

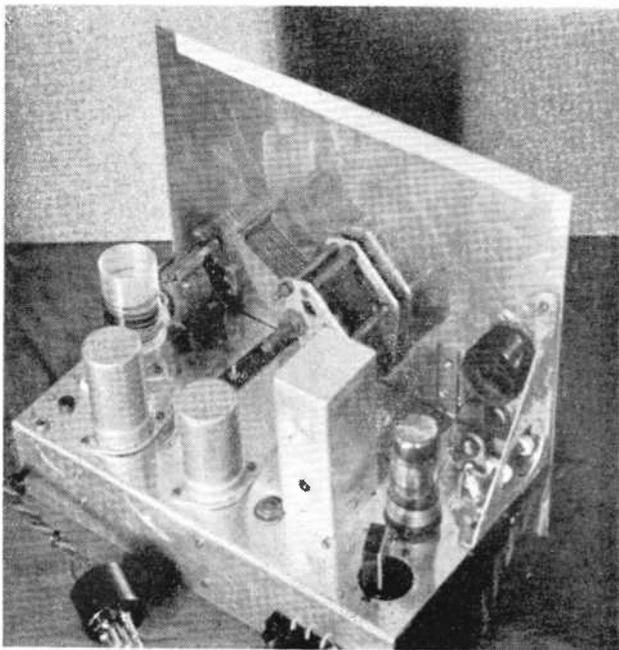
Prediction for December :

This is the month when the 7 Mcs. frequency should be usable on all circuits during the hours of darkness, and especially towards midnight and the very early hours of the mornings. Circuit (b) and (d) should give very reliable communication on these frequencies in the hours aforementioned and circuit (a) usable from dusk to dawn.

During the daytime the m.u.f.'s will show the seasonal increase, making it possible to establish good communication on all circuits, but it should be noted that as soon as it is dusk the m.u.f.'s will decrease very quickly making the 7 Mcs. the best frequency to use for reliable communication.

After the first week of the month the m.u.f.'s will be slightly lower than those during November, (due to the "mid-winter effect") during the daytime period, but the effect will not be noticed even on the 28 Mcs. band except during the slight "stormy periods."

Ionospheric storms are usually slight during the Winter months, and especially during December. Minor disturbances are expected to occur during the 1st, 2nd and 4th weeks of the month.



A Crystal-Mixer Heterodyne

Variable Frequency Oscillator

By

E. KALEVELD
PAØXE

IN the recent series of articles by Dr. Stan O'Hagen, G2CR, on Variable Frequency Oscillators, the principle of crystal-mixer heterodyne VFO's was dealt with extensively. It has been said that this type of VFO is the best of all types in regard to stability, but this stability is only obtained at the cost of a rather elaborate design.

It is hoped that this article will prove that it is perfectly possible to build a VFO on this principle without great elaboration or expense, as but three ordinary valves are used, the output being sufficient to substitute for a crystal on three bands.

It is not proposed to go into details of the theory of this type of VFO, as this has already been done in the excellent series of articles referred to above. A few words about the results obtained with the first experimental models of the unit might prove of interest, however, before describing the present unit.

The first VFO, built along these lines, was completed in 1946. It had been in use with the main CW transmitter for the 10 and 20 metre bands, and throughout the whole time it was in use, T9X reports were received. The frequency shift was nil. Allowing ten minutes for warming up, the drift was only a few cycles after four hours of operating! This drift was checked with an oscilloscope against the B.B.C. on 7 Mcs. During a two-hour chat with WIAW the ARRL H.Q. station, on 28 Mcs. CW, no drift was reported with the crystal-gate in at the American end. Keying was very smooth, without chirps or tails, and no broadcast interference was experienced.

At the beginning of 1947, the writer planned to build a QRP VFO for 7 Mcs. exclusively. All kinds of circuits were tried, but after the results with the crystal-mixer unit, nothing seemed to come up to its performance, so the QRP rig was rebuilt to incorporate this type of VFO also.

One word of caution, however. The power pack for this type of VFO must be very well regulated, and absolutely hum-free. For regulation a neon-tube, delivering about 200 volts to the mixer tube will suffice, but the best thing is to use an electronic regulated power pack with, besides the rectifier, a 2A3 pentode, and a neon-tube for regulation purposes. This is an additional refinement, which is really worthwhile, especially when keying the VFO. But, as already said, for preliminary tests, a hum-free neon-tube regulated power pack is quite sufficient.

Now for the circuit itself. As can be seen, we have in the VFO an ordinary receiving-type mixer tube of the triode-hexode variety. In the writer's case, a Dutch tube—an ECH21 single ended tube—was used, but a 7J7 was also tested, and found to be an excellent substitute. There is no reason why any good triode-hexode or triode-heptode should not do.

In the triode part of the circuit, we have a crystal with its associated circuit. This crystal frequency is mixed with the frequency of the electron coupled oscillator formed by the inductance L1, its capacitors and the hexode part of the mixer tube. In the anode circuit, L3 C3, there appears the sum and the difference of the crystal and ECO frequencies, together with the

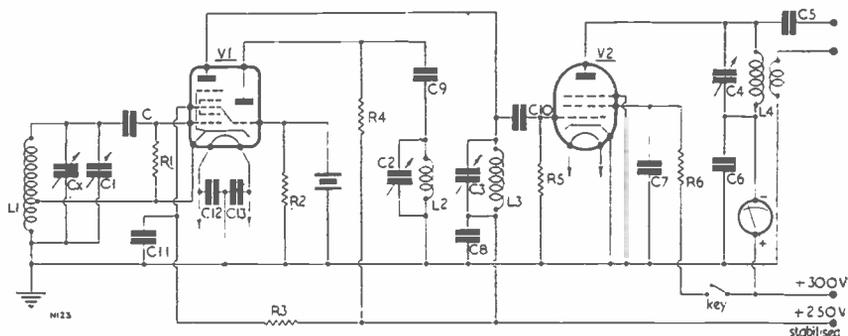


Fig. 1

Capacitors

- C 250 μ F
- Cx, C1 Bandset and band-spread to tune L1 to 300-600 kcs.
- C2, 3, 4. Used with L2, L3 and L4 respectively to tune 7 Mcs.
- C5 50 μ F
- C6 0.01 μ F
- C7 0.01 μ F
- C8 0.01 μ F
- C9 100 μ F
- C10 50 μ F
- C11 0.01
- C12 0.01 μ F
- C13 0.01 μ F

Resistors

- R1 50,000 Ω
- R2 50,000 Ω
- R3 22,000 Ω
- R4 20,000 Ω
- R5 30,000 Ω
- R6 1,000 Ω

Meter

- 0-10 mA.

Inductors

- L1 See text.
- L2, 3, 4, see C2, 3, 4.

Valves

- V1 7J7
- V2 EF50

crystal frequency, the ECO frequency, and a number of harmonics. The choice of the crystal frequency presents some problems. If a crystal frequency near the edge of the band is chosen, say 7400 Kcs., the ECO must tune between 100 and 400 Kcs. to get full coverage of the 7 Mcs. band. But when working on say 7300 Kcs., we can have the crystal frequency on 7400 Kcs. and the image frequency on 7500 Kcs., which need a lot of tuned circuits to get them separated. The advantage is, of course, that the nearer the crystal frequency is to the working frequency, the lower the ECO frequency can be.

A fair compromise is a crystal frequency of 7600 Kcs., with a variable frequency between 300 and 600 Kcs. The coil L1, for this frequency, was made by taking off a number of turns from the secondary of an old I.F. transformer of the type which feeds into a diode. The tap for the diode was, in the writer's case, just about $\frac{1}{4}$ up from the earth end, so that it could be used as a cathode connection for the ECO.

A few further remarks about the crystal oscillator. Difficulty may be experienced in getting the crystal to oscillate. This was found even with normally active crystals. A remedy is to add a little reaction, which is easily done by connecting the crystal with one side to the cathode, instead of to earth. In extreme cases (my 7600 Kcs. crystal was one!) one may even have to go further, and make the triode section a real regenerative oscillator. Fig. 1B gives a suitable circuit, which may also be used for inactive crystals.

This oscillator delivers very little power, and it is necessary to put at least one high-Mu RF

pentode after it to get the output up to a usable value, sufficient to drive a sensitive power tube. In the writer's case, an EF50 was used. This valve also helped to solve the keying problems, as keying in the screen lead of the EF50 gives all that is wanted as far as smooth, click-free keying is concerned.

This two-valve VFO of Fig. 1 already forms a very good oscillator. In this form, it was used at the writer's station for about a year to drive a 6V6-807 transmitter to full output on 14 and 7 Mcs., and reduced output on 28 Mcs., as the 807 then had to be used as a doubler.

The mixer-tube gives so little energy that doubling in the EF50 is not possible. This is one

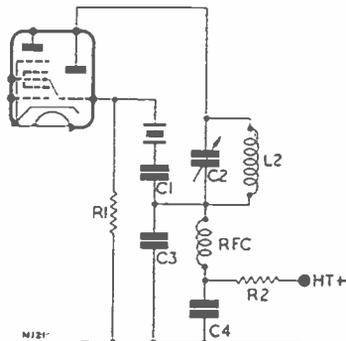
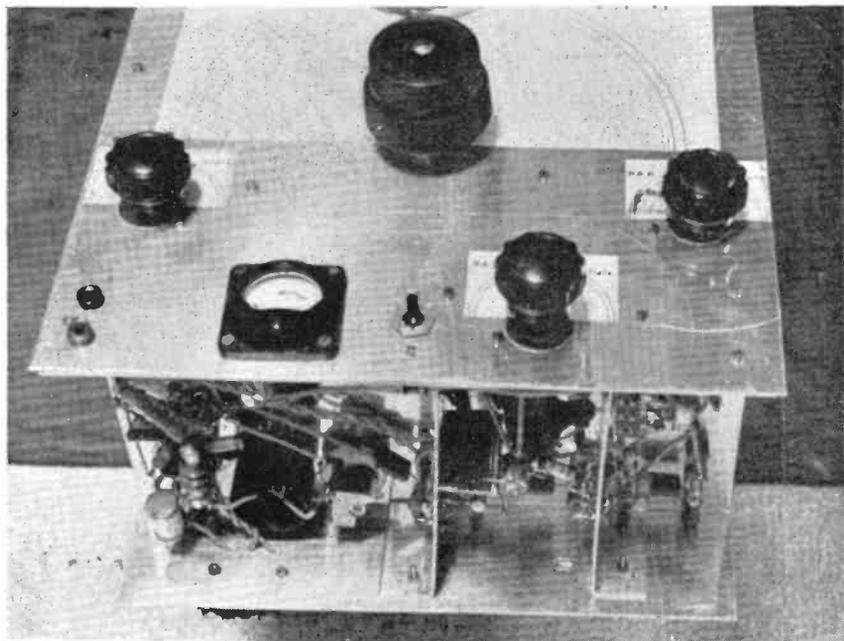


Fig. 1b.

- R1 50,000 Ω
- R2 20,000 Ω
- C1 0.05 μ F
- C3 100 μ F
- C4 0.01 μ F



disadvantage of the simple two-tube unit. Another difficulty is with its coupling to the transmitter. When working straight through, *i.e.* 7 Mcs. EF50 to 7 Mcs. 6V6, the VFO must be inductively coupled to the grid of the 6V6, because otherwise the 6V6 would self oscillate. The coupling is made by a single wire of about a foot long, the VFO and transmitter proper having a common earth. When the 6V6 is used as a doubler, however, capacitive coupling is used. Provision for both types of coupling to the transmitter are shown in Fig. 1. Eventually the 6V6 stage of the transmitter—which was originally a tritet crystal oscillator stage—was re-wired as in Fig. 2, so that either capacitive or inductive coupling could be used to the VFO.

One further point must be mentioned. If the crystal in this simple VFO is 5500 Kcs., and the variable frequency is between 1500 and 2000 Kcs., the sum frequency gives 7000 to 7500 Kcs., and the difference gives 4000-3500 Kcs., which with a little adjustment can be made to cover the eighty metre band. We can thus get two band output from the mixer.

So much for the simple VFO. We will say nothing further about it, but will pass on to a modification of it, by which we can produce an excellent unit having all the advantages that a VFO should have, *viz.*:—For a tuning range of 50 Kcs. on 7 Mcs., 100 Kcs. on 14 Mcs., and 200 Kcs. on 28 Mcs., only the main tuning dial

of the VFO needs to be spun, except for a slight peaking up of the final and antenna circuits. The VFO drives a 6V6-807 combination to full output on 7.14 and 28 Mcs., while it can be used on 56 Mcs. and the 807 doubling. The stability is excellent, and so is the keying. The mixer tube alone gives a very weak signal in the receiver, but it should be possible to work break-in on the same frequency with any station having a strength of S6 or more.

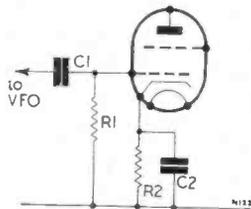


Fig. 2

R1 100,000Ω
R2 600Ω 2-watt. C1 100 μμF
C2 0.01 μF

The dial of the VFO can be accurately calibrated. The chief modification made is the addition of a further EF50 stage, the final circuit of the modified unit being shown in Fig. 3.

Some details of the circuit are as follows:—

The circuit L3 C3 is made wide bandwidth so that it can be left tuned to any frequency around, say, 7100 Kcs. The first EF50 is a buffer-tube,

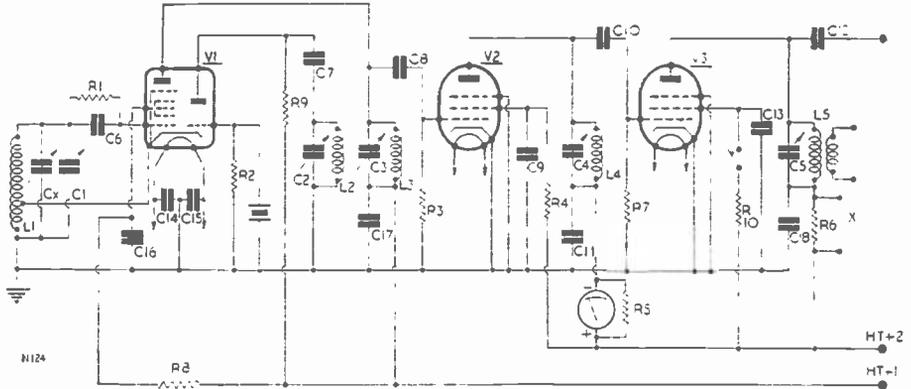


Fig. 3

Resistors

- R1 50,000Ω
- R2 50,000Ω
- R3 30,000Ω
- R4 3,000Ω
- R5, R6, meter shunts.
- R7 30,000Ω
- R8 24,000Ω
- R9 20,000Ω
- R10 3,000Ω

Capacitors

- C6 250 μμF
- C7 100 μμF
- C8 50 μμF
- C9 0.01 μF
- C10 50 μμF
- C11 0.1 μF
- C12 50 μμF
- C13-C18 0.001 μμF.

- L1 L2 L3 L4 L5 } See text
- C1 C2 C3 C4 C5 }

Valves

- V1 7J7
- V2 EF50
- V3 EF50

Voltages

- HT1 250 v. stabilised.
- HT2 300 v.

which need only be peaked up for maximum output when shifting more than 50 Kcs. on the fundamental frequency. The second EF50 works either as a buffer or as a frequency-doubler. This can be done with one coil, which is tuned to 14 Mcs., or to 7 Mcs., with a 160 μμF variable capacitor C5. The output is arranged for either inductive or capacitive coupling, depending upon whether the following tube is used as a doubler or not.

The EF50's can easily be kept free from parasitic oscillations if they are well screened. The valve holders are divided into two parts by a small metal screen separating the anode and grid circuits. It is advisable to make also a metal bottom underneath the chassis for the sake of electrical stability, as well as for mechanical rigidity. No coil dimensions are given as these can easily be obtained from any reference book. Any convenient sized formers and wire can then be used. The dial shown is a home made one, constructed from a utility vernier dial, the pointer of which was removed and replaced by one made of celluloid or similar material.

The initial tuning up of the unit is quite easy. First of all, one should get the crystal oscillator running. This can be checked by listening for its note in the receiver. Then the ECO variable oscillator should be listened for on the receiver and made to work in the correct region, with the right band-spread. In the writer's case, a 500 μμF variable capacitor was just about right.

When sure that both oscillators are working, and working simultaneously, then put the ECO on 600 Kcs., that is, if a 7600 Kcs. crystal is being used. Listen for the beat frequency on 7000 Kcs. This note can be brought up to full strength by tuning C3 for resonance.

Having got so far, plug in the first EF50, and switch the 0-10 mA meter into its anode circuit. C4 is tuned to resonance, indicated by a small dip in the anode current reading. It can also be checked with a loop-lamp.

The tuning of the second EF50 is done in much the same way. In this output, no harmonics or images of any strength whatever are radiated. It should be noted, however, that for inductive and capacitive coupling different points of maximum dip in the anode current occur.

In a following article, a small ten-watt cw. transmitter, built along these lines, complete with power pack, will be described.

* * *

THE VP9D SAGA

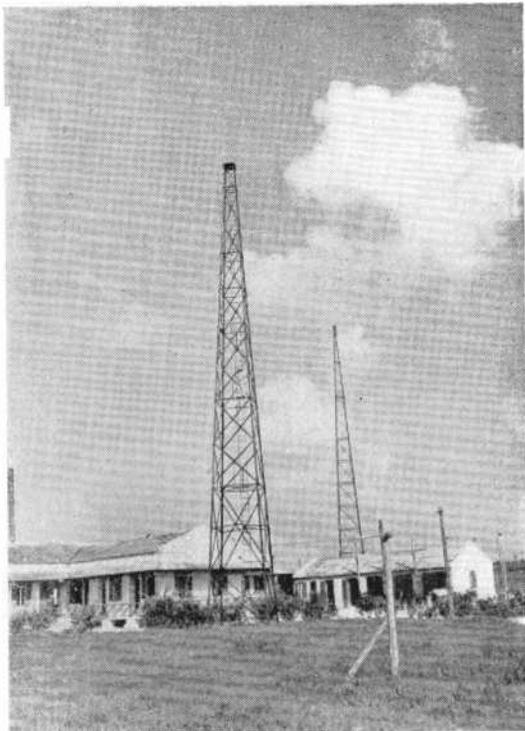
(or it's the gypsy in me)

In the "Annual" two addresses are given for J. Mann, VP9D, namely; W/T Station, Daniels Head, Somerset, Bermuda, and "Seaswell," Watts Farm, Southampton, Bermuda. The latest address received, which replaces these two, is J. Mann, VP9D, c/o Cable & Wireless Ltd., Wireless Transmitting Station, St. George's, Bermuda.

Around the Broadcast Bands

Monthly Survey by
"MONITOR"

All times are given in GMT
(For EST subtract 5 hours;
for AEST add 10 hours)



Cable & Wireless (W. Indies) Ltd., Barbados Station. A central point in West Indies radiotelephone network. Phototelegraphic circuits with London and New York are also operated (Photo by courtesy of Cable & Wireless)

MANY fine reports have come in over the past month from readers and it is difficult to pick out the most interesting items for the allotted space for this article! So on with the news:

● Africa

Belgian Congo. A newcomer whom we welcome to this column is Roy Bull ISWL/G1498 of Reading. He sends along a nice list of schedules he has recently received from various parts of the world. Firstly he mentions OTC2 Leopoldville operating on 9767 kcs. which gives English programmes at 0200-0400 and 1930-2030 daily. Answers listeners' letters at 0200 and 2030 (except Sundays at the latter time). Programme review for the week is given at 1945 on Sundays.

Azores. Bob Iball ISWL/G941 (Workshop) logged CSX2 Ponta Delgada on 4845 kcs., giving call as "Emissora Nacional" with gong note between items and three gong notes prior to call. Heard at 2110-2145 with R8 signals.

Kenya Colony. Waldemar F. Kehler from Schleswig-Holstein in the British Zone of Germany says he has been hearing VQ7LO Nairobi with R9 sigs for about two hours until closing at 2000 on their 4860 kcs. channel.

● Asia

Turkey. Ankara 15190 kcs. logged at 2200 with R6 sigs. heard giving talk on Education in English. (Iball)

Ceylon. Colombo Radio SEAC heard with request programme of records consisting of Folk Songs of the U.S.A. Heard over 15120 kcs. QSA5 R9 1830-1910, 17750 kcs. at same time and strength. (Iball.)

India. Bob Iball lists a nice lot of VU's in: VUD8, 21510 kcs., 0330-0400 QSA5 R6-3 (quick deep QSB). VUD10 17830 kcs., 0330-0400, QSA5 R7. VUD8 15350 kcs. 0330-0400 QSA5 R5. VUD11, 15290 kcs. 0330-0400 QSA5 R4. VUD5 15190 kcs., 0330-0400 QSA5 R4. VUD7, 15160 kcs. 0330-0400 QSA5,R4. VUD8 15350 kcs. also heard at 1450-1545 QSA R7. VUD5 9590 kcs. QSA5 R6-5 at same time (Quick QSB).

Programme consisted of talk in English, Orchestral music, "Dance of the Hours," Talk on Olympic Games relayed from B.B.C. Call at 1500 "All India Radio Delhi" on 9590 kcs., also on 21510 kcs. and 1535 kcs. in the 13 and 19 metre bands.

Philippines. KZRH Manila 9640 kcs. heard at 2145-2210, QSA4 R5 giving Dance Music followed by call at 2200 "KZRH The Voice of Manila." Adverts in English and Filipino languages. (Iball.)

Korea. HLKA "The Voice of Korea" Seoul. 7935 kcs. sends letter veri. Power 5 kw. No English Schedule: 0200-0500, 0800-1400, 2100-2330. Heard R5 on August 20th with chimes and call at 2100. Orchestral Records and at 2130 News in Korean. (Sidney Pearce, Berkhamsted).

● **Australasia**

Australia. Pearce lists "Radio Australia's" BC to W. Coast of U.S.A. at 0430-0545 over VLA5 on 15320 kcs. with often R7 sigs. VLC9 17840 kcs. at R4 and for S. Africa in parallel JLG11 15200 kcs.—R6. Also carried by VLB5 21540 but not heard. The BC to the British Is. was heard over VLC11, 15210 kcs. VLB3, 11760 kcs. (both 1400-1445) and VLA6 15200 kcs., VLG3, 11710 kcs. 1400-1500. E. W. J. Field of Watford sends in schedules as above and also the morning/evening transmissions to "G Land": 0700-0815. VLA6 15200 kcs. and VLC10 21680 kcs. (to 0745) 2000-2145. VLB2 (replaces VLB9) 9680 kcs. VLC, 15200 kcs. and VLA8, 11760 kcs.

New Guinea. Arthur Cushen states that VLT7 on 9520 kcs. is heard much better now to 0800 in New Zealand. Has anyone heard this station in the British Isles?

● **Europe**

Germany. Pearce lists "Radio Munchen" on 6160 kcs. R6 mornings and afternoons (wiped out later by spread of Swiss on 6165 kcs.) Previously same programme on 6080 kcs. until 1600, but now different programme and call "Hier ist Berlin" (a relay of Radio in American Sector of Berlin.

Nordwestdeutscher Rundfunk, Hambourg 7290 kcs. heard R8 (moved from 6115 kcs.)

Waldeman F. Kohler sends in schedules of the following:

"Radio Munchen" 6160 kcs. Mon. to Fri. 0400-1215, 1330-2300. Sat./Sun. 0400-1600. On 6080 kcs. 0400-1600 daily.

"Radio Frankfurt" 6190 kcs. Weekdays 0430-0745, 0915-1310, 1400-2200. Suns. 0430-2200.

"Radio Hambourg" 6115 kcs. Weekdays 0400-0900, 1000-2230. Sundays 0400-2230. "Baden-Baden" 6321 kcs. Weekdays 0400-0650, 0930-1230, 1400-2210, Sundays 0400-2210.

"Radio Stuttgart." 6180 kcs. Weekdays 0930-1230, 1530-2130. Sats. 0930-2200. Sundays 0600-2200.

"Radio Leipsig." 9731 kcs. Weekdays 1000-2215. Sundays 0600-2300.

All transmitters are relays of MW stations.

● **QSL Section**

P. Howard: VLA6, OZH, HER4, D. C. Potter: OIX2 (card showing 15 kw. transmitter). Radio International Tangier, VUD7, VUD9, XGOY, OZH, CKNC, CKCS, WNRA, WNRI, WOOC, WRUL, WRUW, WRUS, KNBA, KNBI, KRHO, WLWO, VLA6, VLA8, VLB3, VLB4, VLB9, VLC4, VLC9, VLG10 (vy FB OM). A. Cushen: YV1RV, VLB2, CS2WD, CR7BU, Johannesburg (4895 kcs.) Vienna, Noumea (600 kcs. 0000-0100, 0730-0900) KZCA, CXA19, Damascus, Stuttgart ZBW. PRL8 (so they do QSL!) Munich, Warsaw, Macassar. L. W. Lewis: OZF, VLB4, HI2T, PZH5, ORY, XEWW, VLA8, Omdurman, Singapore, WGEX, WRCA. W. F. Kehler: VUD7, Andorra XGOY. Sidney Pearce: YSW, XDA, HER4, HER6, HEU5, YNQ, HC4EB, Capetown, Johannesburg, KW1D, XEWN, Manila (V.O.A.) HLKA. U.N. Geneva. VUD. A. V. Wilkinson: CQM4, CA7BJ, CXA10, Monte Carlo F25, SDB2, SBT, RWR Vienna.

● **Honour List**

No.	Name and Country	Countries verified	Countries heard (over 50 only)
1	S. Pearce (Eng.) ...	109	113
2	A. Cushen (N.Z.) ...	108	126
3	J. Beaunoir (Natal) ...	85	106
4	M. Preston (Eng.) ...	59	117
5	E. W. Field (Eng.) ...	54	84
6	J. A. Jagger (Eng.) ...	50	98
7	A. Levi (N. Ireland) ...	49	55
8	Dr. T. B. Williamson (Eng.)	47	102
9	A. V. Wilkinson (Eng.) ...	46	102
10	L. W. Lewis (Eng.) ...	45	83
11	C. M. Southall (U.S.A.) ...	41	76
12	E. Friend (Eng.) ...	40	62
13	E. Strangeway (Eng.) ...	30	73
14	D. O. French (Eng.) ...	29	69
15	W. F. Kehler (Germany)	20	56
16	S. D. Tovey (Eng.) ...	12	56
17	R. Iball (Eng.) ...	11	65
18	J. Burdon (Eng.) ...	6	104

● **6 QRAs**

Compiled by Sidney Pearce each month for your interest:

HLKA, Seoul Korea. Radio Bureau Office of Civil Information, U.S.A., FIK APO, 235 c/o Postmaster, San Francisco U.S.A.

"Voice of America" Manila. International Broadcasting Division, c/o American Embassy, Manila, Philippines.

YSW "La Radio del Pueblo," Santa Ana, El Salvador, Central America.

YNQ "La Voz de la Victoria," Apartado, 338 Managua, Nicaragua.

HC4EB Radiodifusora "Radio Manta," Apartado, 4869 Manta (Manabi), Ecuador. Radio Clube de Benguela, P.O. Box 19, Benguela, Angola, PWA.

On the Ham Bands

Conducted by LES COUPLAND
G2BQC

General

WE seem to have a lot to chew about this month so here goes. Firstly, please try to send in your reports as mentioned in the August issue as it DOES help a lot. D. L. McLean still chases about after gen and QRA's of VR2AZ/VR1 and ZS4AW. Why not through their respective Bureaux? That seems the obvious answer, OM. D.L.M. reports sending a card to ZAIA and receiving a confirmation back from ZAA the broadcasting station! Looks like someone has caught onto the PX1B Radio Andorra scheme!

VQ3EDD is now G5YM, VQ3PYE is now in ZS and MI3ZJ is back in G. Our losses! YI2AM is reported to be leaving Iraq shortly. We hear a rumour that PX1A can be QSL'd via Box 273, Chihuahua, Mexico, but don't blame me if your card comes back! Worth a try, though—or is it? Also through the same channels we hear that RV2 will soon be using a proper call (with FO8 prefix). The only other genuine one is FO8AA.

Then we have a real juicy rumour. It is to the effect that EA8EDZ is now QRT and will be reappearing with an EA10 call sign!! Les Waine queries PKØER, ZA2AA and YA3B. I don't know anything of the former, but some gen on the others will be found in "Jottings."

Harry Pain, VS7PH, would like to get in touch with anyone who operated in Burma so that he can let them have their QSL's. So go ahead, fellows, as it seems a shame to waste perfectly good DX QSL cards. The address is F/Lt. H. Pain, Officers Mess, R.A.F. Negombo, Ceylon. Les Singleton wants to know if AC4YN is active. Well, he is still out there as far as I know, but think he has been QRT for a while. He will doubtless pop up again in due course. How about C8YR for that Zone, Les? Yes, Zone 39 is a sticky one OM. VQ8's are few and far between, but listen around 1600-1800 on 14 Mcs. and you may well strike lucky.

From KA1AI, Ray Basham, via D4AQA, we learn that a new Philippine law prohibits amateur contact with any station other than U.S.A. or U.S.A. Occupied Territory stations. Ray says he would like this to be known in Europe as many fb sigs are heard in KAI, but they just must not be answered.



A view of C. M. Bolton's receiving gear.

Conditions during the past few months have not been too bright really, especially on 14 Mcs.; although there has been some really fine DX at times. "Ten" seems to be well open now and it looks like we are in for a good season—we hope!

Readers' Reports

Bob Iball, G941 (Worksop), starts off this month with (cw) CM2ba, UC2cd, VK3awm, VO2bi, VE8rw, UC6kaa, UF6ab, KP4fh, EK1gw, ZL4jj, VK4rf, VK5ip, ZL2bv, ZS6d, and (phone) ZC6XY, VO2GS, ZS4H, ZS6Q, VQ4SGC.

Don Robertson, GM1051 (Wick), follows with his usual DX log. 7 Mcs. produced some nice DX on cw in the way of OX3mg, EK1mm, SU2tn, TF3ab, CT1az, and ZC6aa. The U stations were as follows: UF6aa, UO5ad, UC2ac, UI8wi, UP2kba, UB5kab, UJ8af, UQ2ai, UA9kob, UR2kab, UJ6bm, and rounds off with UL7kba. nice work Don. 14 Mcs. cw:—RX O-v.2. ZD9aa, ZC1aa, AR1ww, VE8pc, VS7wn, WØmcf/Cl, VQ4err, ZS4ark (?), EA9l, KH6ct, KG6ct. J9abw, 14 Mcs. fone:—J2HYS, EQ1RX, ZC6XY. ZL2GX, ZL3HC, CØ7RQ, AP2M, VK5TR. VK7RK, PK4PQ, C7TY, and TA3FAS. 28 Mcs. fone:—CR9AC, ZE2ST, ZS1PT, VQ2JC, ZB1AH. VQ4ERR. Good show, ob!

W. Mills, 9261 (Chelmsford), using an R107 on 14 Mcs., logged HLIAB, KP4AZ, ISIEH, SHF1X. VE8MI (1045GMT) VK3JT (yes ob, he is consistent) VP2GB, VP9F, AP4B, ZD3A.

R. W. Ainge G219 (Crewe), says TA3FAS does not want SWL reports as he only has enough cards for contacts. (I've only heard him passing traffic, so do not regard him as a true "ham" station. My own view of course). Bob has also been doing fb on 7 Mcs. with W5amr, 5 gnn on cw plus several more, but 14 Mcs. fone really produced the goods—C1CH, C7TY, HR1CE, CP4DG, EQ1RX, FQ8SN, HK1FQ, KH6GS, OQ5BI (I have had a card from OQ5 after 2 years wait). PZ1W, ST2FU, TG9AD, VP3MCB, 5AS, 6MO, 9F. Bob is waiting for ten to open. Well it is now!

Tom Jones (Birmingham), is also a cw "King" and lists AP2a, 4m, C1an, 7at, CR6ai, 7bb, 7mb, (0555 GMT which is unusual, but I know they have been coming through). CT3aa, CP1aq, CX1ac, EQ1ry, FK8ab, HL1ba, J2aaa, 3aad, 9abc, KG6dg, KH6ba, KL7cz, KZ5ce, MD4th, M13ac, OQ5av, PK4vd, TG9rv, T12exo, UD6ah, UF6ab, UG6ab, UH8aa, UI8ac, VE8nw, VE7nc, VQ2he, VS6bd, 71a, 9al, XE1ke, ZD2ghk, and ZK1ac, which is a good one to round off with.

Leslie H. Waive, G328 (Yeovil), sends in his usual "bumper" and also lists things as per last month's mag. RX Eddystone 640, 28 Mcs. phone 22/8/48 between 1300-2130 GMT. CE2CC, CE3AB, CX3AA, HC1JW, KP4ES, EZ, LU3EQ, LU4AN, OA4CO, PY2CK, VE1CR, VP4TO, ZE1JM, ZS1P, ZS6DW. 14 Mcs. cw 10/8/48, AP2b, CX1fy, KG6dg, PK0vg, VS7ps, YV1ai, ZS2dy, ZS3f, and ZS6dj. 14/8/48, 0215-0230, Wipma, roe, sem, 2hlg, 3cme, 4um, and 5luk. Which gives you an idea of when Les heard his stuff. Let's have next month's logs similar please, ob's.

D. L. McLean (Yeovil), comes up with his usual in the form of 1.7 phone, G2BOJ, 2DCB, 2FLK, 2GD, 21K/A, 2MM, 3ART, 3BU, 3MT, 4FC, 4RD, 5MM, 5UH, 6GU, 8HR, GW2BG, 3BUT, 8CT. No log for 3.5 so down to 14 Mcs. phone, with AP2X, 4D, CT2AB, HP1LR, (2134) KA1AK, KL7IT, MD2B, 7HV, 7QRP, OA4BH, OQ5BR, VE4NI 6CW, numerous VK's including 4DA, 5TR, 7AJ, 7AZ, VP6MO, 9F, VQ2JD, 3ALT, 4CRE, XG6AJ, XE1AC, 3AH, ZB2A, ZC6LA, 6XY, ZE1JX, ZL2BT, 4FO, ZS1BH, 6Q. And last but not least, dear old "ten," CE3AB, CR9AC, (1015) FP8FP, (1759), FQ8SN, (1740), J2AAO, KP4FT, MD4JC, OQ5CE, VK6KW, (1024) 6HL, (1013) ZD4AB, ZE1JH. All the above on an AR88LF. Fb OT cul.

J. Carwardine, G2193, (Bournemouth), is a member of the "one tube brigade," and says they have a future. Well OB, I know a lot of fellows who started with them, so they must have something. Log is for 14 Mcs. phone 26/7/48 to 20/8/48, time generally between 2000 and 2300 GMT. C1CH, CE3CU, EK1AB, KV4AD, VQ4ERR YV5AY, ZB1AH, LU7BH, HC1FC, PY6CO, being the best DX heard. Keep up the good work.

Reg Masters, G407 (Portsmouth), turns up

again with his 28 Mcs. phone log, 8th and 9th August, 1700 to 2000 GMT. AR8AB, CE3AB, LU3BH, OQ5CC, ST2CH, VQ3ALT, (quite OK) VQ4NSH, VP4TAI, 4TZ, and ZS1DY.

M. Harrison, G54 (Darlington), has been DXing in PA0 for a couple of weeks but managed to send me his usual. 7 Mcs. cw KZ5fs, (0010), PY1bg, 2afs, TI6jp, VQ2m, W5mhz, 7cfp, and 9jgw. 14 Mcs. C7lt, HC2kg, KG6cv, J2aa, (2145) VE7ke, (2030) 7zm, VK7bz, (0740) VP4TAI, VQ2jt, VS7la, VU2hm, ZC4ar (who is this?) 4UN, and KX6af, (1650 14170 kcs.). Which ends the list in proper style.

CPL. Singleton, R.A.F. (Dunkeswell), turns up with another fb log. He's an old timer at this SWL business, the log covers 1st to 30th August, times being generally 0600-0700—2100-2230 GMT. 14 Mcs. phone, KH6CT, 6CS, 6IJ, OQ5CF, TA3FAS, TG9RV, VE6PM, 8BC, 8MB, 8MI, VK's 2AGW, 2BK, 3AKA (Has Norman left these shores?!) 4KH, 7AZ, ZD1BD, ZM6AF, ZS3F, 3G. Whilst 14 Mcs. cw really gave forth, including CR6ai, 7ad, CT3aa, FO8aa, KB6ad, KG6cu, KH6cd, 6ed, KL7cn, OQ5ra, VE6ab, 8aw, VK2di (my old pal in my VK2 R.A.F. days). 5rx, 7lj, VR2ap, 2bd, ZC1cl, ZP3aw, which goes to show what can be heard on cw.

Keith Fuller, G1618 (Banstead), writes to us from Switzerland. He was fortunate to get hold of an RCA S45 receiver and sends the following log of G's. 7 Mcs. —G3A00, 14 Mcs. —G2AXA, 2SB, 2FKJ, 3DNB, OY, 4RB, 4GL, GW2, FGJ, 5VX. Any of the above wishing to have a report should write to Keith: c/o 20, Colcokes Road, Banstead, Surrey.

Dudley West, G504 (Bristol) uses a "Ham-bander" and hopes to have a pre-selector working with it in the near future. We heard the following on 14 Mcs. phone: C7TY, CT3MN, EL5A, HH2X, HK1DZ, HP1LL, HRICE, MIB (San Marino) TA3FAS, T18KD, VP4TAE, VP5RS, VP6MO, YN1LB, YS1AC, YT1SM. All the above were logged during the month of August.

S. J. Goddard, G2227, uses a Philco Baby Grand Superhet, and managed to pull in the following on 7 Mcs.: CTITX, HB9CX, HB9EW, 9HQ, LX1AJ. 14 Mcs.: MD1B, MF2AA, UB5KAA, ZE1GX.

A. Baldwin, G193 (Leytonstone), has been fortunate enough to have different daily listening periods. His 14 Mcs. cw log certainly has some good stuff. C8yr, CPlap, CR6ai, 6 aq, 7 bc, FE8ab, FM8ad, HC1cs, HL1ac, HP1br, HZ1aw, J9att, KS6lr, KV4aa, KZ5dz, VP1aa, 5ao, 6cdi, VQ8ay, VS2cn, 6ac, 7ad, 9al, VU2cq, ZC1al, ZD9aa, ZP3aw, 8pw, which you must admit certainly contain some real DX.

Bert Enderby, GW703 (Old Colwyn) has also been on holiday, but has made up for it since his return with the following log covering July and August: 14 Mcs. cw, PK4vd, UH8aa, VK6ga, ZD2rgy, ZL4dv, ZS4h, KH6ov, and on phone G6AJ/AP, HLIAB, KA1AI, VK2FO, 2XC, 3JT,



R.S.G.B. N.F.D., June '48. at New Cross, London. Photo shows G3AWD, G2DHV/P and G3CU/P on a trial run, on Whit Sunday, for the 1.7 and 3.5 Mcs. contest

4FH, 7AZ, VQ2JD, 3GW, 4ASC, VS1BA, VS7PS, ZL2BT. See you next month, Bert.

Reg. Vincent, G748 (Enfield), sends a short and sweet log. 28 Mcs. produced (in spite of my saying 10 was dead) AP2G, CO7SQ, KG6AF, KP4CI, KP4ES, LU3DH, OQ5BR, VP4TZ, VQ4HRP, ZD4DB, ZS1BN. He also heard stacks of W6 at R9 on 17/8/48. As far as I know Reg. G6AJ is quite OK and is G6AJ on a route march or some such thing. His latest prefix being G6AJ/AP.

Michael Dransfield, G1731, still uses his 1155. His cw is coming on as he lists the following on 14 Mcs.: EA7au, 7cp, J9anz, ZB1br, and on phone C3EA, CE1AM, CR6AN, CT3MN, EA9AI, EL1A, FQ8SN, HL1AB, KP4CL, KG6EL, W9RZL/KG6, J2AGA, J9ADW, VP1MX, 2AG, 5AR, 6SB, 9G, VR2AP, 3A, VS1AY, XE1BA, ZD3A, 4AB, ZL1HS, 2BE, 3HC. Incidentally, OB, 8TB and myself now run a sked on 40 metres phone at 0815 BST each Sunday morning on 7150 kcs., so you may like to listen in and I should like to know how you receive my signal.

W. J. C. Pinnell, G1832 (Sidcup), has also been on 28 which must be livening up, as he reports hearing VP6CDI, AP2F, ST2AM (1200-1400), VQ2DH, 5PBD, EL3A, ET3AE, VP4TZ, VK6HL and WF4IV/KX6 (Kwajatein Atol, 1400) 14 Mcs. PK3EJ (1540) 4PQ (1640) and on CW ZKlas (0930). Good show OB.

D. C. Matheson, G1542 (Basingstoke), covers August with YI2am, KV4aa, and on phone AR8AB, G6AJ/AP, HH2PL, HZ1AB, KP4CL, KX6AF, VP4TAE and ZS4H.

A. J. Slater, G1650 (Southwick), returns to the fold from his 56 Mcs. listening and gives us or 14 Mcs. cw, C7lt, CR7bc, J4lgb, UAøpa, UD6ah, UF6kab, UG6kaa, UL7bs, VS1ce, VS6bd, and ZS1cl. The best phone heard was CP6FA, G6AJ/AP, J9ACL, KX6AF, PK3EJ, and YS3PL.

Bill Farmer (Ripley), uses an Eddystone 504, and heard CX4CS, HH2OL, TA3FAS, VE7ZM, K9AAL, XE1AC and numerous VK's on 14 Mcs. phone between 0645 and 0745 GMT. The following 28 Mcs. stations were logged between 1800-2000 hrs. GMT.: CE3AB, KP4HW, LV3DH, VP6MO, ZS1FO.

P. Godfrey, G1649 (Southgate), now has a 1-v-2 which pulled in C7TY, VU2GB, MD1CD, TR1P, ZB1AM, EK1AB, OA3GA, ZC1AL/ZC6, TI2JC, ZS6JS.

We end our listeners' reports this month with one from Maurice Wilk, G1584 (Manchester), who still uses TRF receiver and says it is really hot, and proves it with AR8AB, AC4GT (it's really hot!) CN8EQ, FA8CF, J9AC, K2UN, VP5FJ, ZC6LA. Thanks for your good wishes OB, and here's to the next time.

(Continued overleaf)

See page 266 for QRA List

SHORT WAVE NEWS

QSL'S RECEIVED

D. L. McLean: C1BC, DA7RA, HA4AB, HL1WH, J9ACB, KH6IU, KZ5EL, KZ5MB, MD5HJ, OA4AF, OA4BD, PY6CO, ST2AM, VE4LF, VE6PP, VK2VP, VK5YQ, VK3JT, W6LSN, W7ABS, W7JPY, W6JIM/C1, XE1VA, XE1QE, ZP8AC, ZL1HJ, ZS4BL, ZS5BB, ZS5EW, ZS6B, ZS6MB. Fine effort that OM!

P. Godfrey: CX5AP, D5AA, FA3FB, HI6EC, OX3GE, PY1ACQ, PY1IK, SHFiX, VQ4DFF.

W. J. C. Pinnell: VE2CA, ZL4DV.

J. Edwards: W6RWQ/VR6 (This took twelve months).

L. H. Waine: VK3IG, VK3JT, W7LDB, WøYSM, VE2AJ, VE3XN.

R. Masters: KZ5NB, KH6AW, PY7AY, TG9JK, W7HSZ, W7CJU, W7GN, W71BH, WøEJN, WøZEA, VE6HQ, ZS2CB, ZL4FO, W6RWQ/VR6.

R. W. Ainge: W3FRS, W7LDB.

D. Robertson: KL7IT, D4AVL/MD7, VQ8AY, W7CPY, WøUYC, VP1AA (using only 5 watts), HC7KD. These on 7 Mcs.—ZS2CR, MB9AA, W8YOW, W2AHD, 2NUU, 2AIS, 1POK, SM7UX D2IH.

M. Wilks: D2HI, HK1FQ, HK1RC, HK1WN, VK2AGU.

C. Tilly: PY1KZ, VP2GE, J9ACD, W6DAJ, HL1AA, HL1WH, VP6HR, VK3IG, PY7DD, VQ5PBD, CESBH, ET3AE, W6VDH, W6PJN/KG6, K2UN, VK3AJ, VK3LN, ZS1DH, SH2D.
SWN QSL LADDER

MONITOR SESSIONS

Report on Sessions 11 and 12

Conditions during Session 11 were, as usual (!) erratic. Fading was severe and things were difficult in general. However some interesting logs were received, such as:—

F. Randall: (RX-BC348, Ant.-14 Mcs. dipole):—LU2FLN, LU5CS, LU6AJ, PY1ACQ, PY6CO, PY7AG, PY7AW. Fred heartily cursed PY1ACQ for blotting out C7TY!

P. Godfrey (RX-1-v-2, Ant.-half-wave dipole):—YV5AY, LU2FN, LU6AJ, PY1ACQ, PY4BU, CX2CL.

W: Mills (RX-R107, Ant.-half-wave dipole):—CX2CN, LU6AJ, LU2FN, PY2AC, PY6AT, PY7QG, PY7VB, PY8TL.

J. Clarke: (RX-SH10, Ant.-dipole):—LU4dq, YV1ae, PY1ik, PY1dc, PY6aw, ZP3aw, CE5ab, PZ1oy, LU2dd.

Session 12 was very disappointing. Only two diehards braved the hazards of 7 Mcs. to dig the DX! We know it's tough, but we would have thought that more would have "had a go." Martin Harrison heard PY1nc, PY2ada and PY2aif. John Clarke sorted out PY2aif, VO2m, W2qkw, Wlrty and W2suz.

Future Sessions

Bert Endersby has heard all the zones—bar Zone 39. So, says Bert, what about some longer sessions, lasting perhaps a week, aimed at some of those rare zones? Seems an idea so we are going to give it a try out. Sessions 17 and 18 are based on this idea, so we are keeping our fingers crossed! Here are the next four efforts—Remember these dates !!!

Session 15 •

Date: October 16th. Time 1700-1900. Band: 28 Mcs. Target: Outside Europe (except W1, 2, 3 and 8).

Session 16

Date: October 23rd. Time: 2130-2300. Band: 7 Mcs. Target: Anything outside Zone 14.

Session 17

Date: October 29-November 5th. Band: 14 Mcs. Target: Stations in Zones 1, 2, 32 and 39.

Session 18

Dates: November 14th-November 20th. Band: 14 Mcs. Target: Stations in Zones 18, 19, 23, 26 and 29.

Deadlines for these sessions are (15 and 16) November 8th and (17 and 18) December 8th.

SWN QSL LADDER

For Confirmed Amateur Reception

No change in the first positions this month, although Conrad Tilly consolidates his number 3 position by adding four new countries. Looks as though there will be a real tussle for first place soon! Al Slater gets an extra country this time; so does Arthur Levi. However, poor old Arthur goes down one despite his addition since Don Robertson puts on a spurt and goes up one position. Several newcomers, including D. E. F. Burney who makes a good start by occupying No. 12, make their debut this month. Here are the final positions:—

Position	Name	Countries	States	Zones
1	M. Preston (London) ...	130	48	38
2	E. A. A. Hardwick (Misterton) ...	130	35	35
3	C. G. Tilly (Bristol) ...	125	44	36
4	D. L. McLean (Yeovil) ...	119	48	36
5	A. J. Slater (Southwick) ...	97	45	33
6	A. H. Onslow (Hove) ...	94	47	?
7	E. W. J. Field (Watford) ...	86	?	?
8	D. Robertson (Wick) ...	78	40	32
9	A. Levi (Belfast) ...	75	12	29
10	E. Caffey (Yarmouth) ...	64	29	24
11	R. Masters (Portsmouth) ...	62	41	29
12	D. E. F. Burney (Tring) ...	52	44	23
13	W. Winchester (Eastbourne) ...	48	?	20
14	D. G. Garrard (Ipswich) ...	45	22	13
15	P. Bysh (London) ...	41	18	13
16	L. H. Waine (Yeovil) ...	39	37	21
17	J. Edwards ...	32	26	16
18	D. Shallcross (Borrowash) ...	30	3	7
19	W. J. C. Pinnell (Sidcup) ...	29	3	13
20	J. J. Carr (Ramsgate) ...	12	9	14

JOTTINGS from By the NOTEBOOK G3AKA

INTRODUCING a proposed new section to Ham Bands, the following notes will, we trust, prove interesting to the DX gang. Les refuses to take any responsibility for anything in this section—and I don't blame him! The same applies to his section! So, on with the notes . . .

ZD7AA says he is on St. Helena, but we have reasons for doubting this. Time will tell . . . We will all miss John Powell, who is closing down VQ3HJP after eleven years of hamming. John is off to VQ4-land so maybe we will be hearing him again soon . . . EP3H, otherwise Phil Williams G3LJK, says that the only other legit ops from Iran are EP3D, EQ2D and EP1AL. All four are strictly undercover and in fact Phil's card says so in large capital letters! The lads churn out their own QSL's on a small hand press and it's quite interesting to read the reverse sides as they are printed on service forms! Phil is using 15 watts to a W8JK beam and hopes to be back in Blighty soon . . .

HV2B says he is c/o Radio Station, Vatican, but cards are returned "unknown" . . . LZ2AA is another of the awkward squad. He gives his QRA as Box 123, Sofia, and is quite probably O.K. He is, however, strictly undercover, so please be careful OM's . . . Surprise! ES1TU in Estonia QSL's! So does LZ1AA and ZA2AA. Wonders never cease! . . . We regret to say that the ham who put San Marino on the amateur map recently passed away. This was, of course, MIA . . . A new 'un in Oman! He is VS9FJ and gives his QRA as c/o R.A.F. Station, Sharjah. Don't rush!

According to *Amateur Radio* (Australia) the VK9 Bureau manager (VK9CW) will only handle cards for VK9OU, BI, NK, ML and GW. He says that he has had to return to Federal HQ a large batch of cards for other VK9's who are too lazy to send along SAE's for their cards. Fancy being a VK9, working all that DX, and then being too indifferent to collect the scalps! A queer world . . . For the super-DX merchants ZM6AF is Box 90, Apia and ZM6AH is Box 57, Apia . . . VR2AZ is now signing VR1B—he is on Canton Island (British Phoenix group). Country hods, please note . . . Next year we may hear a VQ9. VQ8AD says he is going there and will give the country chasers something to get hot under the collar about!

F. Pardy, ex-VS2BT, is now back in G again, with the call G3DZJ. He says that all SWL reports have been answered and all contacts QSL'd. He wishes to express his sincere appreciation to all hams who helped to make his sojourn in Malaya a pleasant one . . . ZS6NU is now signing ZS9B, with 15 watts of CW. Also, there is ZS9NC. If you have had him, his QRA is Aeradio Palapye, Palapye Road, Bechuana-

land . . . No need to rush after FE8AB as he will be there for at least another year. He is, of course, ex-FQ3AT and ex-F3AT.

Some of you may be puzzled over the FZ8AA (Clipperton Isle) affair, so here is the gen. Though the official prefix for Clipperton is FC8, a certain W6 happened to park on the island—hence FZ8AA. After that he landed on Cocos Island and started up as TI2KQ. (This is a Costa Rica possession and is not to be confused with the Cocos Islands—ZC2—in the Indian Ocean). We also hear that he may be on from one of the Colombian Republics islands. This chappie knows the sites to pick! Has anyone any further gen on him, please?

MX3KG is worth searching for on 14120 kcs. or thereabouts . . . VR5AF has now gone QRT . . . PK4VR has moved off to Dutch Borneo and can now be heard using the call PK5VR . . . XP1CQ says he is in Nepal. D. Burney says he gives his town as Khatmandu "with the Green eye of a little Yellow God"—whatever that means! The same reader mentions that J4JI reckons he is in Tokio but "cannot divulge full QRA." Oh, yes!

Those asking about XG6AJ will be relieved to know he is genuine in Muscat. QSL's to RSCB . . . Several have also asked about SL5AB. He is OK and is a Swedish Army station in Stockholm. QSL to SSA . . . Those wanting San Marino may have caught up with I1PL/M1 who has been on 14 Mcs. CW. Then again, why not pop up to 7 Mcs. phone where M1B is often heard? . . . How about those YA's? There is YA5B ("Box 5, Kabul"), YA3B, YA2D and probably a few others. Any gen?

Well, how do you like this feature? If it is "passed" we will make it a regular event, though, of course, it will vary in length from month to month according to space available. Also, any notes for inclusion would be greatly appreciated.

* * *

R.S.G.B. AMATEUR RADIO EXHIBITION.

Second Annual Show at Royal Hotel, Woburn Place, London.

THIS exhibition, which was visited by nearly 6,000 amateurs last year, will be opened by Dr. R. L. Smith-Rose at 2.30 p.m. on Wednesday November 17th. On the next three days it will be open from 11 a.m. to 9 p.m. Admission is by Catalogue which will be published on October 15th and will be issued free to RSCB members. Non-members may purchase catalogues at the door, price 1/-, or may obtain them direct from RSCB HQ (New Ruskin House, Little Russell Street, W.C.1), price 1/3.

Last year's Exhibition was an extremely interesting one and was fully reported in these pages and there is no need for us to tell readers that it is *very definitely* worth making the effort to get to. This year's show will be even bigger, so book the date right now—November 17th—20th.

V. H. F. NEWS

FIRST 145 MCS. RESULTS

Denis Heightman, G6DH, looks as though he is going to be right on top of 145 Mcs., just as he was with 60 Mcs. and with 28 Mcs. in its early days. On Sept. 14th at 2233 G.M.T., he made the first two-way contact with PAØPN! RST 568 for PN and 579 for Denis! A very fb QSO was held for fifteen minutes. Previously to this, on Sept. 10th, ON4FG and PAØPN made first ON/PA 145 Mcs. contact. RST 569 both ways. Since then they have had frequent contacts over a distance of 50 miles. PAØPN's frequency is 144.7 Mcs. and ON4FG's is 144.1 Mcs.

On 16th September, G6PG, G2XC and G6LK were contacted and G5BY was heard, the latter being 240 miles away. On the 17th, G5BY, G6PG and G2AS were heard and some unidentified phones. On the 18th, G8DV was QSO'd and G6VX, G5TZ, G6LK and G5BY were heard in patches. On the 19th, two fones were heard—but they did not sign in CW, and were two weak to identify. This was around 1100 GMT. At 2103 ON4FG was cross-band QSO'd 58.5/144 Mcs., 6DH having to use 58.5 as 4FG had no 145 Mcs. RX. This QSO was over a distance of 155 miles. At 2216, G5RP was QSO'd over a distance of 110 miles. The gear at G6DH is as follows:—TX, VFO (Type 37 Oscillator) driving CV6, doubler from 72.5 Mcs. to an 829 B final. RX, "Rather a mongrel, hastily prepared from a wartime Deco RX—6AK5, rf EF54, rf EF54 mixer, EC52 osc grid inject by very loose coupling of coils," to use 6DH's own words. He remarks that 2 rf stages seem necessary. The antenna is a four element beam—horizontal—45 ft. high.

G6DH's operating times are as follows:—

Beam SE. Listen 0645 GMT. Call 0650. 145 Mcs. On 3580 kcs. at 0700 to exchange reports etc. Listen 145 Mcs. at 1840. Call for 5 mins. at 1845.

Beam SW. Listen 1900. Call 1905.

Beam SE. Listen 2045. Call 2050.

Beam SW. After 2130 onwards.

Jim Bramhill, G2BMI, reports that G2FMF, Hillingdon, Middlesex, has worked G8GX and G8DV. He has heard 6VX, 2AJ/P, 2MR, 2AXG, 6LK and 2XC. 2FMF's receiver is a very much modified Type 27 converter. The r.f. and mixer stage have been made very broad-band and fixed tuned, the tuning being done by the oscillator stage, which is tuned to 72 Mcs. using an EF50. The VR137 triode which is normally used does not have a rigid enough electrode assembly and tends to be microphonic. By using an I.F. frequency of 7.5 and the second harmonic of the oscillator he has got the Type

27 working quite nicely but he does not relish the idea of repeating his efforts!

Arthur Simons, Mablethorpe, Lincs., is all set to be on 145 Mcs. As soon as the finishing touches to the receiving equipment are finished he hopes to be on the band with a modified BC 960 receiver. He recently visited 5MQ in Liverpool and learnt from him that there are 14 or 15 stations active on the band there.

420—460 MCS. BAND GRANTED

The Post Office have announced that as from October 1st, transmission can take place in the 420—460 Mcs. range. Telephony or CW may be used, the input must not exceed 10 watts.

60 MCS. ACTIVITY

Everyone is asking whether, now that 145 Mcs. has been granted, 60 Mcs. will be cancelled. No official announcement has so far been made about the future of this band, so for the present, activity is continuing as in the past. Interest in the new band has somewhat overshadowed 60 Mcs. and some readers say that all activity in their parts of the country has ceased. Arthur Simons for instance said that as far as Lincolnshire is concerned, they might as well be without the band. However, some readers have sent in good reports for the month.

Don Bradford has again sent in a good log of 5 metre stations heard, which included some Sporadic E, viz., I1VA, F9VQ and OK3IP. His total this month is 51 stations. Jim Bramhill, who forwarded Don's log remarks, "... this is a good effort and together with the stations I have heard makes a total of 90 stations at least," which shows that activity is by no means at an end in some parts of the country.

C. Ollett, G2OR, Chelmsford, Essex; listened in over the period of the Danish VHF Contest. Whilst he did not hear any OZ signals, he did manage quite a good log of "G" stations, which included G2CIW, G6VÇ, G3BTL, G3AEX and G2KG. He uses an R1481 Rx which has been modified somewhat, including provision for very good bandspread.

J. O. Harris, ISWL/G680, Guildford, sends in his first report on 5, using a Type 26 Converter. So far his only reception has been G2FBU, but he is going to devote more time to the band now that he has got started. No, O.M., it does not look as though we are going to lose 5 just yet, so let's have some more logs.

That must be all for this month. Let's have some more logs on all the VHF bands by the 12th next month. So till then, "Good Listening."

* * *

THE "ANNUAL"

Readers will be interested to learn that the first impression of the Annual is now almost exhausted. A reprint will be put in hand shortly, but this will naturally not be ready for some time. Those who have not yet had their copy, and who do not wish to wait, are advised to order at once. The price is 3/6 from local booksellers or 3/9 post paid from this office.

AROUND THE SHACKS

No. 21

LESLIE V. HUGHES
ISWL/G670

INTEREST in radio started as far back as crystal-set days, the writer subsequently taking a course for a Marine Radio Operator at the Radio Maritime Wireless College (Marconi) Cardiff, but, owing to the slump in sea traffic at the time, employment had to be sought ashore; a congenial occupation being found as a cinema projectionist. On the outbreak of war, joined the R.A.F. as a Wireless Operator/Air Gunner, radio still being the main interest. Upon being discharged as medically unfit for air crew duties, G670 went to Cable and Wireless Ltd. as a technical assistant at their Brentwood receiving station, and from there to the transmitting station at Ongar. When the job, which was a temporary one, terminated, back again into the projection game, this time as projectionist at the Metro-Goldwyn-Mayer's Empire Theatre, Leicester Square, London. Radio, as always, is still the Number One hobby. S.W. reporting was started in January 1947, the Rx then being a homebuilt T.R.F.5. As the photo shows, the main Rx is now a Radiovision V55R which in conjunction with the 5-10 metre converter on the left gives a fine account of itself. In the cabinet above the receiver is the speaker, S metre and power pack for the converter.



Main interest at the moment is in aerials, various types having been used from time to time. Those at present in use are a 14 Mcs. folded dipole, and a 66 ft. Hertz: switching from one to the other can be done at the lead end near the receiver.

The writer would welcome correspondence from other readers interested in receiving aerials (QRA 165 Southgate Road, Islington N.1.) All gear is home built with the exception of the V55R.

Stand-by receiving equipment includes a battery TRF and a converter. G670 intends to follow his hobby through to its logical conclusion and get on the air himself eventually, and steps have already been taken with this end in view.

THE SNOBS

OUR Editorial in the July issue under the above heading, has produced quite a number of letters of congratulation. One reader—who had better remain anonymous—even went to the trouble of writing a poem on the theme, which we feel will amuse other readers. We have pleasure therefore, in reproducing it herewith:

"I say OM., have you seen
the Short Wave News?
The Editor therewith, holds
some very strong views;
About the Ham Spirit and
Cliques at some of the Clubs.
Oh Boy! You should read it;
He certainly gives some rubs!
You've to be an "Old Timer"
Or one of the "Boys,"
Able to talk of working DX
And it certainly annoys,
To see young enthusiasts,
Put on the shelf,
Instead of being in the circle,
Obtaining some help.

It tells of one SWL
(From cat-whisker days)
At the Club was made most
welcome, in various ways.
Then—"I've found he's not
A Ham!" one O.T. deplored.
So he got the Cold Shoulder
And was thereafter ignored!
So if you think this is harsh
Or perhaps very cutting,
You know what they say,
If the cap's a good fitting,
If your ears are burning,
Let's hope it'll do good,
'Cause we all want to see Radio,
One Big Brotherhood."



International Short Wave League

MONTHLY NOTES
BY G3AKA

ANNUAL SUBSCRIPTION 1/-

CHAPTER NEWS

West London (Sec.: J. Hedges, 6 Littlejohn Road, Hanwell, London, W.7.)

Please note the new address for secretary. John Hedges has taken over as Deputy CR for West London as we are losing John Hebborn to H.M. Forces. We are sorry to lose the services of John but he will resume his role as and when he has finished his course of square-bashing. Good luck, John, and go easy with the Sergeant Major!

The Chapter is still going strong. A talk on aerials, by G3UQ, was well received and the monthly Query Bee provided the customary enlightenment and amusement. This event, by the way, was won by G3UQ. Now that the Chapter is growing, a new streamlined programme has been worked out and includes more time devoted to constructional work. An election was held recently and the following members were returned to office: J. Hedges (Secretary), G. Ford (Treasurer), G3AKA (Chairman), G. Friend and J. Clarke (members).

Manchester (Sec.: M. Wilks, 57 Longley Lane, Northenden, M/c).

We are pleased to report excellent progress of the new Chapter. A constitution has been drafted, meetings arranged and a programme mapped out. The response has been good. Manchester members should note that meetings are being held at the Church School Rooms, Northenden, every second Friday starting at 7.30 p.m. Future meetings will be held on Oct. 1, 15, 29, Nov. 12, 26, etc. Morse practice and talks will be given; some of the talks are Transmitter Technicalities (by G6DN), Aerials (by G3BMP), The Amateur Radio Exam. (by G2169 and G2170—both successful this year), Marine Communication (by M. Wilks) and General Construction (by G1547).

The Lancashire CR has asked me to remind North Manchester members that there are enough members resident there to form another club, so what say to a few volunteers? Any offers should be addressed to J. Whittle, 2 Church Terrace, Darwen.

Ipswich (Sec.: H. W. Dean, 11 Royal Hospital School, Ipswich).

The Chapter has been reorganising and has come to the decision that a room should be sought in the town itself. Hitherto meetings have been held at R.H.S. but as this is some miles outside the town many town members have had

difficulty in getting transport home. So now it is hoped to hold meetings in Ipswich itself and the club invites any members not already in the Chapter to write for details.

North West London (Sec.: F. Wells, 8 Evangelist Road, Kentish Town, N.W.5.)

Harsh words have been said about summer holidays and their effect on club attendances! However, meetings are picking up again and the club is all set for an active winter session. Several members have constructed gear for 144 Mcs., and the Chapter as a whole is very keen on the new band.

The club has recently been presented with an R1116 receiver which was promptly disembowelled of the low frequency side as a precaution against any prospective "Home and Light" addicts!

Birmingham (Sec.: G. Moore, 42 Fern Road, Erdington, Birmingham, 24.)

Once again the morse gang were robbed of their session! This time it was due to an error in room booking. Ah, well, perhaps next time, OM's . . . The visit to the Droitwich station by members and their friends took place on September 11th. Further visits are planned, such as to police and fire service stations, radio factories, etc. Talks and demonstrations continue as per programme and from all accounts the club is going well. Keep it up, OM's.

East London (Sec.: A. Baldwin, 28 Wallwood Road, Letonstone, E.11.)

The secretary has come out from behind his Iron Curtain at last! Yes, they are still busy down at Leytonstone—too busy to let us know what's going on! The Easteners are mostly interested in DX and they go in for it in a big way. The Chapter has started making their own station list (from the Annual) using our record cards. They hold regular listening contests and surveys. Morse practice is to be installed in an effort to convert those who do not know the difference between a dit and a dah. Also, a start has been made on a club receiver—using EF50's. The club library is now well stocked.

After this burst of eloquence we leave the secretary to recuperate!

Rotherham—Sheffield

Apparently we gave an incorrect impression about the line-up in a recent issue. There is not a separate Chapter for both towns, but one club to cater for both. This merger came about

earlier this year and has been in effect ever since. The Yorkshire boys are a keen bunch and cordially invite any new members to join in the activities. Though the Chapter is not one of our largest they have the right spirit and after all that is the main thing. Interested members should write for details to:

Rotherham.—B. Kendall, 13 Fraser Road, Rotherham.

Sheffield.—J. Blakeley, 85 Sandford Grove Road, Sheffield, 7.

Local News Items

Scotland (J. Thomson, 15 Chambers Street, Inverleithen, Peebles.)

Work is progressing with the object of getting the Glasgow Chapter functioning. Needless to say, any new offers of co-operation would be appreciated. Through the good work of the Glasgow TR, the ex-TR and the courtesy of the Scottish Tourist Board, it is hoped to be able to issue special SWL or QSL cards to all Scottish members. Full details will appear if the negotiations prove successful.

Liverpool (TR: M. McNeill, 20 Victoria Road, Great Crosby, Liverpool 23.)

Will Liverpool members please note the above address as it is that of their new TR. Malcolm hopes to get a club going but *he must* have the fullest co-operation from local members. What say to dropping him a line? Whilst still up in Lancashire we would like to congratulate Jim Whittle, the CR, for successfully passing the Amateur Exam. Jim is now swotting for his morse test, Good luck OM.

Middlesex

The CR for Middlesex, L. Harris; has found it impossible to carry out the duties owing to business commitments and we therefore have made arrangements for a successor. His name and QRA is:—

C. C. Plummer, G1907, 54 Harvey Road, Greenford.

G1907 would like to hear from any Middlesex members who are interested in getting together in various parts of the county. Close co-operation with the West London section will be maintained since these two areas interlock.

U.S.A.

We have recently appointed two new State Representatives. The first is J. Seebold, who will be taking over, from Paul Dilge, the State of California. His full address is:—2622 L. Avenue, National City, Calif.

The second new SR is S. A. Roberts, 5058 Sedgwick Street, Washington, 16, D.C.

The Manual and Circuit Service

Manager: G. K. Sutherland, Dyffryn House, near Park Crescent, Llanfairfechan.

A fair number of members have made use of the service since its inception and we have cards for 65 different circuits on the files. Members who deserve "special mention" for their help are Ron Hare (G1491), T. O. Allen (G1598), F. Harrison, (G1434) and E. Fearn (G581).

We also have in the files 14 instances of queries "pending," i.e. queries for the loan of circuits that we have not yet been able to find. Therefore, I feel I must ask for more members to come forward to help make this section a success. We have done quite well considering how long we have been in operation, thanks to the co-operation of many members, but we must have still greater participation to build the section up. So how about dropping along any details of circuits to have on hand? After all, maybe you will want to use the service yourself one day and one good turn deserves another!

The Correspondence Bureau

Manager: W. Davies, "The Bungalow," Kingsley Fields, Nantwich, Cheshire.

Little has been said of the pen-pal section, although it was the first service the League started. We are pleased to report that it is enjoying a great degree of success and this is due in no small measure to the good work of the manager, Walter Davies. There are numerous members on the files now, mostly from the British Isles and Eire, though several addresses are from the U.S.A., Austria, Malaya, etc. Wally puts out an "S.O.S." for more members from overseas to come forward, so how about some of you W's, VE's, VK's, ZS's, etc. sending along to the bureau for details? We would also like to mention that a subsidiary scheme is now being run in conjunction with the pen-pals section for those interested in exchanging picture postcards. Full details will be sent on request. Please note that this scheme is organised by Cpl. J. Graham, Married Quarters, Collins Barracks, Cork, Eire, and all correspondence on the subject should be addressed to him.

The ISWL Badge

No, this is not another "plug"! We feel that these are not needed at present as the badge seems to have found almost 100 per cent. approval. This para is to acknowledge, with due appreciation, the good work of Chas. Stewart, G1259, who was responsible for finding the manufacturers in the first instance. We are sure that all members will wish to thank Chas. for his efforts. And, incidentally, if you haven't yet got a badge, you but this is not a plug! Still they DO look attractive (and they cost 3/6d.)!



Station Description No. 17

RADIO ANDORRA

(Main Building)

THE radio centre of Radio Andorra is found situated in the principal valley of the Principality of Andorra, between the localities of Encamp and Las Escaldas, 2 kilometres from Encamp: it overlooks the main road from France to Spain through the Elvira Gate.

The building is erected on a rocky peak shut off from the valley which it overlooks, and is at an altitude of 890 metres (2,760 feet).

The aerial is installed at an altitude of 1,640 metres (4,920 feet) on Lake Engolasters, supported on two 125 metre masts, and is coupled to the radio station by a feeder of more than 850 metres in length.

The station and the aerial masts are completely independent, being separated by a difference in altitude of 850 metres.

This is the first time a wireless installation of this type has been carried out. Many technical difficulties had to be overcome, inasmuch as it was necessary to couple the station proper with the aerial under the best possible conditions, in spite of the length between them and the

difference in altitude of 850 metres. Thanks to the arrangements made and the location of the aerial directly overlooking Lake Engolasters (1,640 metres), the range of this 60KW station is perfect and allows easy and particularly powerful reception in all Europe and North Africa. On short waves, Radio Andorra's concerts are easily received in the U.S.A., Australia, New Zealand, Indo-China, etc.

The wavelengths used simultaneously are :—

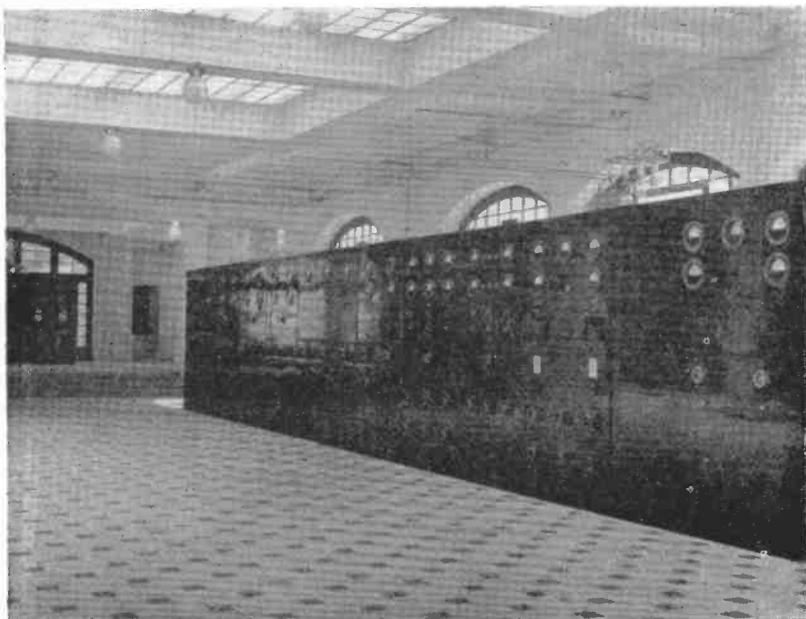
Medium wave 426.10 metres ...	722 kcs.
50.04 metres ...	5,995 kcs.
32.15 metres ...	9,330 kcs.

The building, specially designed and executed to the requirements of a radio centre, was built on an isolated peak overlooking the valley; it is built entirely of granite.

The building is made up of :—

Firstly, a ground floor, to which access is obtained by some large doors, comprising :—

- (a) A machine room including the intake and distribution points of the main power supply, circuit breakers, lighting and



A View from the Transmitter Room

power transformers and water circulation pumps to supply water for the power valves.

- (b) A big workshop with machine tools and complete equipment for dealing with mechanical or electrical repairs on the spot.
- (c) A garage.
- (d) The main entrance to the transmitting halls.
- (e) A dwelling place for the custodian.

Secondly, the first-floor consists of transmitting rooms and their associated units:—

- (a) A large hall 39 metres by 12 metres approximately in which are located the transmitters proper; that is to say, the S.F.R. medium wave 60KW transmitter (425 metres daytime, 274 metres at night), and the S.F.R. shortwave transmitter.
- (b) A rectifier room, same width as the former, 10 metres long, with high tension rectifiers for feeding the power triodes of the transmitters, as well as filter units between the rectifiers and the transmitters. Current is supplied by the Andorran Centre of the F.H.A.S.A., of 350 KW at 5000 volts A.C. and is converted to continuous current at 16,000 volts.

- (c) A motor room fully communicating with the two previous ones, in which are located all groups of converters required to feed the various parts of the medium and short wave transmitters.
- (d) Adjoining rooms—studios, salons, modulation office, engineer's office, etc. etc.

Thirdly, the second floor comprises:—

- (a) A terrace occupying the whole of the upper part of the large transmitter room, allowing easy manipulation of the useful secondary aerials, arrival of the feeder, etc.
- (b) Four large rooms making up a reception hall and secretarial and editorial and reception offices, all arranged very practically and very up-to-date.
- (c) Two living places, housing the personnel day and night.
- (d) A round tower of granite, 28 metres high, built at the northern facade of the building. A winding stairway goes up the centre of the tower, allowing access to a covered terrace which is quite cut off from the rest of the installation.

In front of the building there is a large lake of 400 cubic metres capacity, in rectangular form 12 metres by 18 metres, which affords a reserve of water used for cooling the transmitter triodes, and is fed from an abundant spring.

(Continued Overleaf)

RADIO ANDORRA—(continued)

An intake cabin for electric power connects this centre with the distribution lines of the Andorran hydro-electric power supply system.

The building of Radio Andorra started about halfway through 1937. This was very arduous work as there were two sets of workings, one at an altitude of 890 metres, and the other at 1640 metres.

The workings during the winters of 1937 and 1938 were particularly hard, because the towers and the aerial were erected on a plateau where the ground for six months of the year was completely covered with a thick carpet of snow, and Lake Engolasters was completely frozen. Furthermore, it has been necessary to cut down part of the wood which was encountered on the slopes of the mountain in order that there would be an unobstructed passage for the feeder and its supporting poles.

Radio Andorra was finished in July, 1939, and on the 7th August the first transmissions were inaugurated. These were interrupted for some months in consequence of an accident which happened at the end of August and by reason of the international conflict.

Transmissions were resumed regularly on April 27th, 1940, and these take place every day from 12 noon till 1430 hours, and from 1900 hours till 0001 hours.

Announcements are made in French and Spanish and the programmes are half in French and half in Spanish.

The studios are actually located between Las Escaldas and Andorra la Vieja, at the side of the mount of Sant Pere, in large buildings on an ancient cliff, the Roca de les Anelettes at the entrance to the magnificent Ordino Valley, and they overlook the valley of Andorra which all along the length of the Valira river and its banks open towards Saint Julia and Spain. It is here that one finds the administration and it is here the men and women announcers introduce the concerts of Radio Andorra.

Radio Andorra's address is as follows:—

“Radio Andorra,”

Roc de les Anelletes,

Andorra la Vieja,

Principado de Andorra.

GENEROSITY ?

A few days ago we had a letter from a reader asking if we had been presented with the States of Virginia (W4) and Wyoming (W7) as part of Marshall Aid! Gnashing our teeth, we humbly suggest that these two States be inserted in the list on folio “ix” of the Annual. It's a trying life!

QRP CLUB NOTES

BY
MAL GEDDES
G2SO

AN extremely interesting letter has been received from VQ4RAW of Kenya this month. The SWN certainly gets round the world! He has been reading the QRP Club Notes since they began and inspired by the success of QRP operators over here, he built himself a triet crystal oscillator using a 7 Mcs. crystal doubling to 14 Mcs. and with 200 volts on the plate has had some good results with 4.8 watts. The results of two evenings intermittent operating were contacts with:—GW3AHN, GW3AWP, F3AD, G3AH, MI3FG and D5AD. Reports varied from 449 to 569. For an input of 4.8 watts such results are very good indeed and 4RAW is to be congratulated on these contacts. RAW says that out there in “darkest” Africa, 7 Mcs. is a washout in the evenings and 3.5 Mcs. is not permitted. His frequency for those who are interested is 14092 and 14020 Kcs. Sunday mornings are given over to local ragchewing on 7 Mcs., several of the VQ4 gang using ex-Army 21 sets, with an average power of 1 watt phone, yet the results over 150 miles away are often S7 to S9! VQ4RAW concludes his letter by saying that “if any of the QRP gang want a check in this direction, they will find me a converted QRP enthusiast on 20 metre cw most evenings at 1800 GMT.”

We usually confine these notes to “less than 5 watts” QRP work, but we should like to mention some interesting work done recently on 14 Mcs. by G4FN of Westcliff-on-Sea, using a Type B2 (Major), Type B2 (Minor) and a 145 Oscillator. The Type 145 was used on 7 and 3.5 Mcs. and the following have been QSO'd:—F9MU, G3CXJ, 3TN, 6NW, 5NF and ON4ZX. The actual input is unknown but 4FN informs me that it is very small. With the B2 (Minor) and an input of 5 watts, the following have been QSO'd on 7 Mcs.:—PAØ, EI, F9, DA, ON4, DA3 and GW. On 3.5 Mcs., ON4, PAØ and D2. The B2 Major with 20 watts input has done extremely well on 14 Mcs., On 23rd August alone, EA3MA, gave him RST 579 and two W2's and W6AY gave him 569. The next day W3 gave him 569 and the “piece de resistance,” VK3MC, 339. Several other contacts have been obtained and the following countries have given good RST's:—II, LA, SM, OK, UA3, CT1, W2, 3 and 6 and VK3. Both these B2's are extremely compact transmitter/receivers and could be used with good efficiency as portable and/or emergency apparatus.

By the time these notes are published, the SWN QRP Contest should be in operation, so good luck to all.

MY FAVOURITE RECEIVER

No. 20. G. JORDAN, ISWL/G132

NOW that the 28 Mcs. band has opened up again many readers will be thinking in terms of "ten." Therefore we have selected for this month's Favourite Receiver one which was built specially for this band. It is a battery receiver although the owner is now using a stabilised 120v power pack for HT.

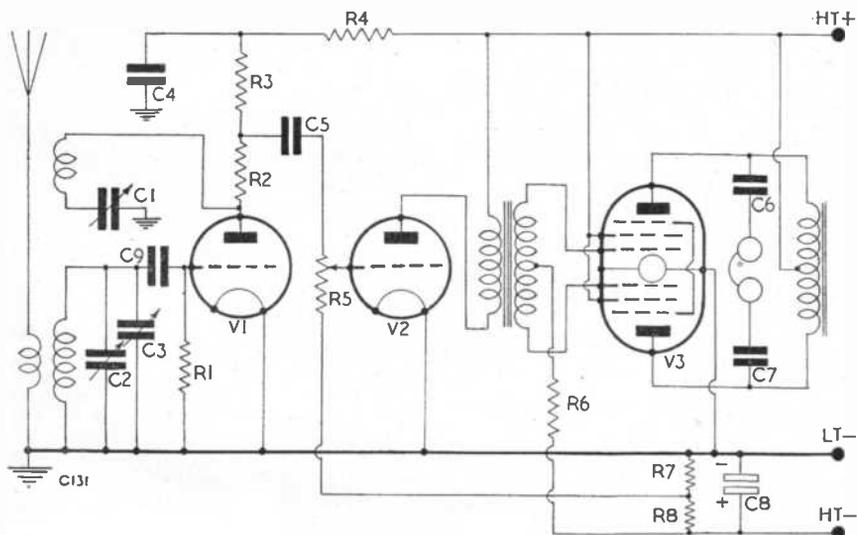
The circuit is of the O-v-2 variety, using an HL2K as leaky grid detector. The six-pin coil used in the receiver is an ordinary commercial 9-15 metre type, which serves the purpose adequately. Though not shown on the circuit diagram, for simplicity purposes, the bandset capacitor, C2, is controlled by a six-position switch. In other words, instead of using the variable in the ordinary way, the spindle is taken to the switch so that six "spot" positions are obtainable. This ensures that the bandspread readings will always be the same on any given position.

The detector stage is coupled capacitively to the first audio stage, which uses an HL2. R5 is the volume control. The HL2 is transformer coupled to the output stage. This is rather interesting since the output circuit, using a double pentode QP21, is of the quiescent push-pull type.

This circuit was very popular years ago but appears to have fallen into disfavour. It has much too in its favour, however. Since only a small current flows in the anode circuit, with no signal, and a larger current with signals, it means that there is less drain on the battery—a good point in these days! It is also worth noting that an undistorted output of almost $1\frac{1}{2}$ watts (with 120v HT) can be obtained if operating correctly. This, of course, gives really good loudspeaker strength. With QPP output one must obtain a coupling transformer with a tapped secondary. The ratio should not be less than 3 : 1.

The receiver uses auto-bias for the audio stages. Why some people have the bother of grid bias blocks and straggling leads when an electrolytic and a couple of resistors will do the job beats us!

As for the results, the receiver will put up a good show with DX, most parts of the world having been logged on it. The noise level is claimed to be really low and taking it all in all it looks to us like a pretty effective "DX machine." Anyone needing further advice or help can write to the owner at 58 Andrew Street, Silvertown, London, E. 16.



List of Components

Capacitors		Resistors		Values	
C1	200 μ F var.	R1	4 M Ω	V1	HL2K
C2	25 μ F var.	R2	1,000 Ω	V2	HL2
C3	5 μ F var.	R3	50,000 Ω	V3	QP21
C4	2.0 μ F	R4	20,000 Ω		
C5	0.02 μ F	R5	0.5 M Ω pot.		
C6	0.1 μ F	R6	250,000 Ω		
C7	0.1 μ F	R7	150 Ω		
C8	25.0 μ F, 25V wkg.	R8	400 Ω		
Inductors Six-pin coil.		Coupling transformer with CT secondary.		LF Choke with CT	

SW Transmissions from the Antarctic

Continued from last month. Compiled from notes supplied by Rubens J. Villela, Sao Paula, Brazil.

(The suffix "Z" indicates GMT.)

AUSTRALIAN ANTARCTIC EXPEDITION

On February 11th, 1948, I received the following dope on this expedition, from Mr. Kenneth R. Boord, SW Editor of *Radio News*: Three Victoria amateurs left Perth for Heard Island to set up and operate base stations. Callsigns are VK3OY, VK3ACD, VK3AMG; another amateur VK7AE, left later for Macquarie Island. Will use xmtrs. on ham bands. Base stations on Macquarie and Heard Islands will be for communication with Sydney; callsigns and frequencies allocated are: Macquarie Island—VJM, 9940: VJM2. 12255; VJM3, 15845; VJM4. 19255. Heard Island—VJH 9940; VJH2, 12255: VJH3. 15845: VJH4, 19255.

Their ship, the "Wyatt Earp," arrived Antarctica in early December, 1947, men will remain in Heard and Macquarie Is. for about one year; another group will look for a good place for a permanent base, in a place near the south magnetic pole.

Unfortunately, I have not yet succeeded in catching the signals of this expedition, because it seems they are using mostly the higher freqs., on 15 and 19 mcs., and my S-40 has very little sensitivity in this side of the spectrum . . . and Heard or Macquarie is quite a bit more distant from here than the other Antarctic bases . . .

The following is an excerpt from my log book, re the Australian Exp.:

Feb. 12, 1948-1210Z- Heard VJH4 calling VIS, Sydney, in CW, on 19255. RST1/229: gave a coded WX msg. bad line QRM.

Feb. 13-1200Z—In the HQ129X of my cousin, PY2AIA (which is FB in all bands): VJH4 on 19255 calling VIS in Cw. RST3/249: then began line QRM! 0149Z—In my S-40 again: Heard VJH3, 15845, in CW, sending "VIS4 de VJH3 Sri. almost lost pse try agn." Was RST569: this is surprisingly good: Was using a 7-ft. indoor antenna, and further more the sensitivity of my rcvr is very poor here!

I have not heard VJH recently, although I try it sometimes.

RUSSIAN ANTARCTIC WHALER FLEET

Is made up by some 11 ships, now already going homewards. The flagship is the K/B "Slava," The other ships are numbered as follows:—"Slava" 1, 2, 3, 4, 5, 6, 7 and 10; there are also the "Kosmos 4" and the "Kosmos 3." The fleet is very well equipped, including radar. However, they have been having some troubles, as food shortages, damages, etc. Several Norwegian men had been aboard the fleet, headed by "Kapiteinen" Nilsen. The fleet is commanded by Capt. Solyanik Bondareva.

Lots and lots of messages have been copied here, from the "Slava," in Russian, and I have tried to translate some of them, but I find it too difficult . . . I did not find any references to the "Slava" Antarctic Fleet in any newspaper or magazine.

All traffic from the fleet is passed through the "Slava." Call letters USFA. At present, USFA is using mainly the 27-metre ship band, on arnd 11160-11180 kc. (CW). Contacts Odessa, UCA3, 12360a, around 1900Z. Contacts Moskva, RWD, 6890a, around 2100Z. Guards 181 or 180 metres for the rest of the fleet. When still in the Antarctic, also used the 48-metre band (around 6215) with the other ships. Call of the "Slava 3" is USFD.

Much tlc have been handled: about 1330 mgs. in Nov., 1947 (each one with not less than 25 words), and some 900 QTC's in each month from Dec., 1947, to Mar., 1948. Mgs. include long "presses." ciphered, results of the fishery, etc.

Daily situation reports are sent to Moscow, informing actual position in latitude and longitude, weather conditions (temperature of air and water; winds: visibility, etc.), speed, etc.

Since the fleet sailed from Capetown to the ice, daily position was given only in degrees of latitude: and when the ships crossed the 50th parallel of South latitude, situation reports had been given in ciphered code (groups of five numbers each, but not WX obs.).

The fleet reached the Atlantic through Gibraltar. On Nov. 15, 1947, QTH was lat. 4.17N and long. 9.57W; then followed nearly a straight line to Capetown, where it arrived on Nov. 28. During the staying in this port, the USFA was QRT due to a mechanical failure in the motors. Left Capetown to the Antarctic on Dec. 2; on the 6th crossed latitude 50 degs. South, at speed of 10 knots. On Dec. 7, a message says; "During the 24 hour period of the snowstorm and fog, radar worked very well." Proceeded then probably till reach the NE-coast of Antarctica. The fleet remained in South Georgia for some days, where the "Slava 2" was repaired. Supply of the fleet there ended on March 16, 1948, and left for the whaling again. Returned to Capetown on about April 21. After a short staying in that port, for repairs in the "Slava" 2, the fleet departed back to home. Is now in the Coast of Africa—

Other stations that had been contacted by the USFA are: ROT, Moscow, 7340a, 36 m., 12892.5 (23.27 m.), 20 m. RWG, Moscow, 7450a, 10204... (29.40 m.), 10310 (29.11 m.), 11529.5 (26.02 m.), 13169.4 (22.78 m.) UFB, Odessa, 48 m. Also Z90C Capetown, 8440, for a few times, on 36 m.

From Dec. 18 to Dec. 23, tfc. from the USFA to Odessa was relayed by the Russian ship UKTB (24 m.-12480a, 12410a), the Slava used then the 24 m. band or the freq. of 8505, to UKTB.

USFA had been contacting also LGC, Bergen, Norway, 11170a, and tfc. was then handled by a Norwegian radio operator. Other frequencies used by the USFA:—6210, 8200, 8210, 8300-8350, 8505, 11070-11100, 11150-11190, 12300, 12410, 12480.

The USFA had not been receiving in good condx. those Russian stations listed above, but since about Jan. 17, Moscow is using RWD, 6890 and now reliable sigs. are received by the "Slava." She uses a very fast "bug" and sometimes also automatic CW; seems to have a very powerful transmitter. Once, the 2nd harmonic of the USFA from 8320-16640 was heard here at 0010, QSA3/2! (QSA5-S9 plus in the fundamental freq.).

ARGENTINE ANTARCTIC BASES AND SHIPS Bases:

Melchior, Deception and Laurie. The base of Melchior was installed by the Argentine Navy in March, 1947, at Punta Gallowan, Gamma Island, Melchior Archipelago. The base of Deception Island was set up also by the Argentine Navy, in January, 1948. The meteorological observatory of Laurie Island, South Orkneys, was priorly established by Sir William Bruce, of the Scottish National Antarctic Expedition, and was purchased by Argentina in 1904; a radio station was set up there in 1925—(call LRT. now LRW); exact position is lat. 60:43:00S, long. 44:46:57W.

LQX, Naval Detachment of Melchior, sends WX observations each 3 hours, commencing at 0600, to LOL, Naval base of Darsena Norte, B. Aires. First operated on amateur bands. At present, uses 14820 (varies) till 2100, and QSYs. to 6610 (varies); LOL answer on the same calling frq. Freqs. available are (for fone and CW): 411, 500, 4500, 5586, 6610, 8440, 8690, 10510, 12230, 12330, 13700, 14820. Argentine Naval stations are never exactly on the "announced" freq., and may be as high as 50 kc. off.

Contacts also LPL8, Buenos Aires, 15420, for personal dispatches, around 1330z and 1530Z, on 14820. A fone contact with Radio Pacheco, Buenos Aires (6440, 9240, 10720, 13675, etc.) is scheduled at 2200Z on 12330 kc.

LQX2, Naval Detachment of Deception Island, operates similarly as LQX, in the same times, freqs, etc. Fone to Bueno Aires is scheduled to 0215Z, on 13700. Had been contacting LSD9, Buenos Aires, 18115, for a few days in February (by the time that an Argentine Fleet was manoeuvring in Antarctica). Commentaries were read and recorded at LSD9, for further reproduction. Used 14820, at 2300.

Sometimes special contacts are done between LQX and LQX2, in fone or CW, usually on 4500, 5586 or 411 kc. LQX and LQX2 are received here QSA5-S9 on 14820, at 2100Z, and QSA3 on

6610 at 0000Z. During some months ago, mostly used freq. was 12330, fone and CW, but had always had QRX.

LRW, meteo, observatory of Laurie Island, S. Orkneys, operates on several freqs. of the Argentine Navy, mainly on 10515, 14820 and 6610, and mostly with "tactical" call letters, to ships and bases, on the same calling freq.

Contacts LQV, Buenos Aires, 12100, 5905, at 1230 and 0036 on 13700 for WX reports (CW). Contacts LPI, Buenos Aires, 10265, 10080 at 1930 and 2145 for non-military tfc. May have also fone contacts with Buenos Aires, as the other "brother" stations, and probably on 13700 kc. Operates on amateur bands with call LU1ZA.

Sometimes LPC, Ushuaia, Gobernacion Maritima de la Tierra del Fuego, broadcasts a special news program (bulletin of navigation) in fone, on 14850 (varies), around 2315. I believe they have discontinued these transmissions at present, but may start again. Other freqs. of LPC are: 3215, 5250, 6480, 7425, 10240, 10330. Other station in Tierra del Fuego is LPA, Rio Grande, 15530a, and the others listed for LPC. (F and CW).

CHILEAN ANTARCTIC BASES AND SHIPS Bases:

The so-called base of "General Bernardo O'Higgins" (Greenwich Island, Discovery Bay) was inaugurated by Chile's president on Feb. 18, 1948. The base of Puerto Soberania (Baia Chile, or Sovereignty Bay) was established a year ago. Exact position of "O'Higgins" is: latitude 63:19.1, South, long. 56:54.7 West (according to several Brazilian and Argentine newspapers; this gives approx. in the extreme point of Palmer peninsula, about 500 miles north of Marguerite Bay, and therefore not a "short distance" from Marguerite, as stated by the *New York Times*. Puerto Soberania is very near O'Higgins, probably also in the same Greenwich Islands.

CDA, Puerto Soberania, has available the freqs. of 5550, 5760, 5790, 5990, 8500, 12000, and probably also 13440 or 13333. Now using mainly 5550 and 12000 (fone and CW).

Contacts CCP, Punta Arenas, 12950, at 2315Z, and ships at 1200Z, and also other stations as CCT (4760 kc.), etc. etc. Has fone contacts with CCD, Santiago, 4200, 10500, 10530a, 12720a, at night, irregularly. By some months ago, had special programmes to the Chilean B/C network "Cooperative"; contacted then Punta Arenas (9200, 7400, 7445), on 5760 kc. Good signals here.

CCW1, O'Higgins, operates mostly (or only) on 16665 kc. approximately. Contacts RAC7, Santiago (Army), 15755 (also 7400) at 1230 and 2000 (in CW).

Contacts RAC5, Punta Arenas (Army), 15835, (also 7445) at 1300 (CW). Contacts CBN, P. Arenas (Air base); 12890 (also 6730) at 1330 and 2300Z, irregularly. (CW).

Has long fone contacts with CEBV (or CE8DV) Santiago, 14565a, Fridays only, at 2300Z. In fone, as well as on ham bands, uses

amateur call letters CE7ZA/CE7ZB. Is usually on the 20 m. band. Has comparatively good sigs. hr, in Cw (QSA3, but would be QSA5-S9 in a good revr.), but suffers bad CW-QRM fm LPD, Buenos Aires, some 2 kc. above.

Gives long situation reports (WX, general conditions of the base, results of ore researches, etc.) each 15th of the month, to CBN, air base of P. Arenas, 12890a, at 1200Z, or 2300Z. The last report, of April 15, says on April 11 they had a storm with winds up to 200 kilometres per hour, cutting the antennas; they collected several varieties of minerals, but they could not identify them . . . Also says the HT-4 radio xmtr. is working excellently.

CE920, "Radio Ejercito," Punta Arenas, 9200 kc. broadcasts daily from 0000Z to 0300Z; has news between 0045Z and 0100Z (Spanish only). This station is sometimes used to contact the Antarctic bases, for special programmes (is of the BC network "Cooperativa Vitalacia").

On April 24, was broadcasted as a special programe to the Antarctic bases, over stations of the "Cooperativa," from Santiago; spoke the wife, mother and sons of the commander of Puerto Soberania. Commercial traffic from P. Arenas to Santiago is handled over CEN, 14640a, 7420a, m.c.w. (nice for practising code up to 60 wpm).

It seems there is now a permanent Chilean Antarctic Fleet ("Flotilla Antartica") apparently headed by the frigate "Covadonga," CACV. In January, when the tanker "Rancagua," CARA, was sent to Puerto Soberania, carrying a garrison to this base, special programmes had been transmitted to the Chilean BC network "Cooperativa," leadered (in this case) by CE920, "Radio Ejercito," P. Arenas, 9200 kc. Contacts were established with the Chilean Army station of P. Arenas, RAC5, 6 mc. band, 7400, 7445, 15835a, or the B/C channel of 9200. CARA used 16600 kc.

President Videla went to Antarctica in February, aboard the transport ship "Presidente Pinto," CAPN, escorted by the "Covadonga," CACV. CAPN used mainly 11029 kc., in CW (to CCS, 12000), and fone (to CCD, 12720a). The CACV was mostly on 8200 kc.

Long messages were passed to CCS on 11029; I copied hr a part of the telegraphic interview that President Videla gave to the United Press. They have had some troubles with coded msgs.: once the operator said: the "Z" was frequently misread in CW, and it's better to change to another cipher system. Videla sailed from Punta Arenas to Santiago aboard the "Araucano," CAAR.

Chilean CW operators have an unusual "fist" and at first it's quite hard to understand their code . . . the "rhythm" is different.

NORWEGIAN ANTARCTIC WHALERS

If you want to listen to Norwegian whaler ships in the Antarctic, you might try the 27-metre ship band (especially 11.0 to 11.15 mc.), at around 2100 or later. The whalers contact

mainly LGC, 11170a, and other ships (exchange then QTH reports). I have been listening to several of them, saying ". . . 100 tonn sperm . . ." The 54-metre band is also often used. An "odd" freq. used by Norwegian ships is 9980, to LCJ, Oslo, on the same freq.

The Norwegian whale research ship "Bratregg" is now in Antarctic waters. In early March, the Argentine minesweeper "Parker" interfered with the "Bratregg" within Deception harbour, demanding production papers and to report in future to Argentine base for instructions and permission to anchor . . . British harbour master cancelled the instructions.

By the way, LB4QA, an Antarctic Norwegian whaler, had been operating on the 40-metre amateur band, some months ago.

THIS MONTH'S DX QRA'S

- AC3NC: Post Office, Gangkok, Sikkim.
 CLAG: Box 409, Shanghai, China.
 CP1J: c/o American Embassy, La Paz, Bolivia.
 CR6AN: Box 51, Lubango, Angola.
 CR6AQ: Box 79, Luanda, Angola.
 CR6AR: Box 147, Benguela, Angola.
 EA8AN: J. R. S. Montero, Triana 76, Las Palmas, Canary Islands.
 ETSAH: Box 858, Addis Ababa, Ethiopia.
 FK8AB: John Duplat, Noumea, New Caledonia.
 HS2F: Signal Division, Siamese Navy, Bangkok, Siam.
 MD7DA: D. MacDonnell, Cyprus Signals Squadron, M.E.L.F.3.
 MD7QR: A.A.C.S., U.S.A.A.F., RA D Nicosia, Cyprus.
 M13US: Capt. R. Cole, U.S. Radio Station, Asmara, Eritrea.
 PK5SHL: D. G. Veltcamp Helbach, Oranjeplain 4, Bandjeremasin, South Borneo.
 PZ1FB: Miss Gloria A. van Beck, Box 109, Paramaribo, Surinam.
 PZ1FM: Box 118, Paramaribo, Surinam.
 SV4UN: Messrs Litz & Joyal, UNO Station, Hotel Desroses, Isle of Rhodes.
 VP2GB: G. Evans, Box 62, St. George's, Grenada.
 VP3ACS: W. Garner, 184 AACCS Squadron, AP0857, c/o PM, Miami.
 VP4TZ: R. Carle, Fort Reade, Cumuto, Trinidad.
 VQ4SC: Box 4028, Nairobi, Kenya.
 YJ1AB: P. C. Eedt, Vila, New Hebrides.
 YS1GM: S. Gagala, San Salvador, El Salvador.
 ZC1CL: D. Lackyer, c/o R.A.F., Amman, Transjordan.
 ZC6LA: APO 150, Security Forces, State of Israel.
 ZC6XY: J. H. Swanson, Neoga, Ill., U.S.A. (op is W9HXP).
 ZD1BD: Royal Signals, Freetown, Sierra Leone.
 ZD1LQ: c/o Lungi Airport, Freetown, Sierra Leone.
 ZD2RCY: Nigerian Signals Squadron, Lagos, Nigeria.
 ZD9AA: c/o SARRL, Box 4887, Johannesburg, S. Africa.
 ZS2MI: Radio Station ZS2MI, Marion Island, c/o Postmaster, Capetown, S. Africa.

BOOK REVIEW (Continued from page 267)

Data has been included on the operation and characteristics of typical magnetrons.

The above synopsis is necessarily very sketchy, as our space is so limited, so that it is impossible to more than indicate roughly the ground covered. Much of the information contained therein will doubtless be "above the heads" of our average readers, but it is equally certain that a great deal of it will be of interest and value to those, particularly the transmitting amateurs, who are interested in the new high-frequency bands which are gradually being released.

H.O.

BOOK REVIEW

TRADE NOTES

RADIO CALLS OF THE WORLD published by the New Zealand DX Radio Association. 44 pp. Demy 4to. 2/6.

This publication will be particularly welcomed by those of the fraternity who are interested in Medium Wave DX. Split into suitable sections are lists of North and South American stations, those from the East, Europe and Africa. In these lists, given in order of frequency, the call sign, power and time zone are shown. In addition a complete list of Australian and New Zealand broadcasters with schedules is included. A sizeable list of worldwide short wave stations, complete with schedules, is another useful feature of this publication.

Another section gives medium wave stations by call sign, alphabetically. For the amateur station fan, there is a full list of the addresses of all VK hams. A few odd items complete what is surely one of the best half-crown's worth that the medium wave DX-er is likely to encounter.

Though this excellent publication was published primarily for NZ. DX. RA members, it is available to readers in this country at 2/6d. post paid. The address is the Secretary, NZ. DX. RA Inc., 20. Marion Street. Wellington, C.2., New Zealand.

W.N.S.

Very High Frequency Techniques. Published by McGraw-Hill Publishing Co. Ltd., Aldwych House, London, W.C.2. In two volumes. Vol. 1, 554 pages; Vol. 2, 476 pages. 84/-

These two most interesting volumes have been compiled by the staff of the Radio Research Laboratory at Harvard University, and deal mainly with techniques of general interest at frequencies above 100 Mcs. They are well printed on high quality paper, and are very comprehensively illustrated.

Volume 1 contains 22 chapters dealing with various types of aerials, impedance matching, ultra high-frequency measurements, direction finding and honing systems, power generation, various types of oscillators, including resonators and magnetrons, and modulators.

Volume 2 deals more with the receiving side, and its 13 chapters cover power measuring devices, general receiver considerations, transmission line filters, tuners, detectors, and mixers, local oscillators, intermediate frequency amplifiers, receiver output circuits, and measuring equipment.

The present day trend towards the higher frequencies demands comprehensive data and information on these techniques. Such information has, up to now, been very scarce, and particularly in the case of the magnetron—an essential in wartime radar equipment.

(Continued foot of previous column)

A RANGE OF HIGH-SPEED ELECTRONIC FLASH TUBES

The first of a very wide range of electronic flash tubes has recently been announced by Mullard Electronic Products Ltd. The tubes so far released are the LSD3, LSD3A, LSD4 and LSD7.

The LSD3 is a compact tube which is especially suitable for lightweight portable photographic flash equipment. It is built on a simple 4-pin valve base, and has a flash energy of 100 joules and a flash duration of approximately 1/3000th second.

The LSD3A has the same characteristics as the LSD3, but is mounted on a 3-pin base for replacement in existing equipments.

The LSD4 is a 400-joule flash tube for studio equipment with provision for the use of an internal modelling lamp. It is mounted on a 3-pin base.

The LSD7 has been specially designed for medium-weight professional feature equipment. It is similar in dimensions and general characteristics to the Type LSD3, but permits nearly twice the energy dissipation, and light output.

All these tubes have exceptionally high luminous efficiencies, high stability of characteristics and extremely long life. They have in addition excellent light quality which makes them especially suitable for colour photography.

The tubes are intended for use at voltages between 2000 and 2700, and are further characterised by exceptionally low triggering voltages, a fact which adds to the safety of the equipment and permits the use of ordinary sockets similar to those used for radio valves. Another feature is that the duration of the flash given by these tubes is so short that it permits the "freezing" of the fastest movements.

In addition to their use for high speed photography, these, and other tubes to be announced shortly, may be used for industrial stroboscopic applications, and as intermittent light sources for certain dynamic balancing operations.

Interest in the national newspapers in colour printing is bound to focus attention on these new flash tubes which have been developed with this application in mind.

The list prices of the new flash tubes are as follows:—

LSD3 and LSD3A	... £5 . 0 . 0
LSD4	... £6 . 0 . 0
LSD7	... £5 . 10 . 0

Details of trade terms can be obtained from Mullard Electronic Products Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

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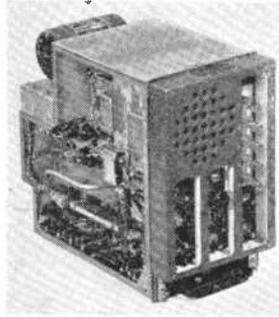
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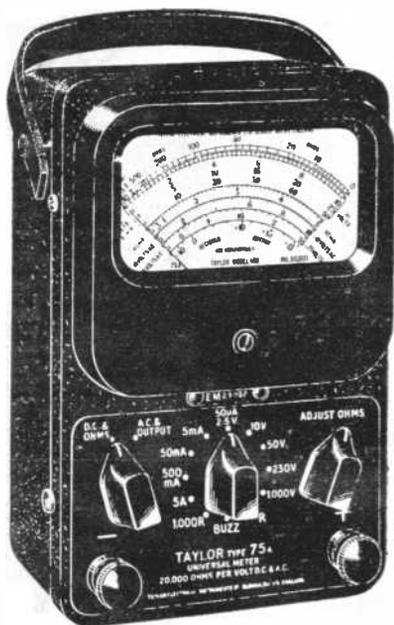
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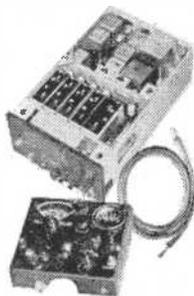
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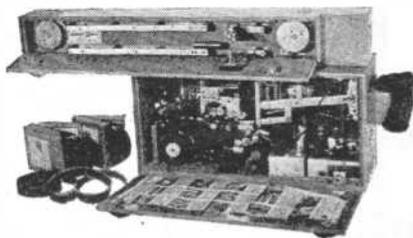
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