

# AMATEUR RADIO



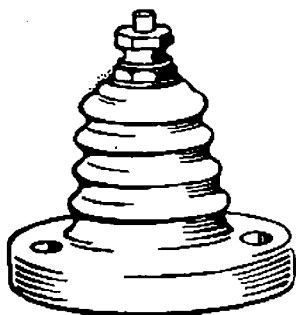
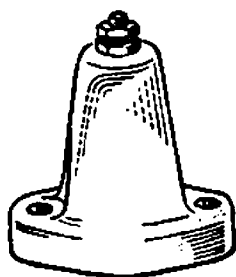
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**JANUARY, 1939**

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Editor—W. R. GRONOW (VK3WG).  
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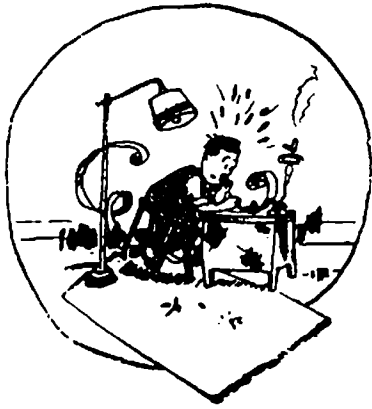
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# EDITORIAL

Let us do some plain talking. It is about this Defence question. You know as well as we do that our Empire, our Ideals, our Country, our Homes are worth fighting for, we are men the same as any others, with the difference that we have a hobby that is of great value to our country and a highly efficient organisation, the W.I.A., as our mouthpiece. The Institute, way back in '29, realised the value of trained W/T Operators in a time of emergency, and after negotiation the R.A.A.F. Reserve was born. With pride you can look on that organisation as the Australian Amateur's contribution to the Defence Forces of the Commonwealth, an organisation that trains and maintains a large body of operators at small cost to the Air Force. So highly has the Wireless Reserve been thought of that it has been duplicated, in modified form to suit local conditions, in New Zealand, South Africa, Canada and the Mother Country.

But the international situation is such that none of us can rest in safety. The Institute must again take the initiative. There are literally hundreds of patriotic Hams desirous of serving their country through their ability as operators, which the R.A.A.F. Wireless Reserve cannot cope with. The suggestion of the formation of an Australian Amateurs Emergency Corps has been received on all sides, but the time has not arrived when that may be of paramount value. That should only be our FINAL effort, not our initial one. The Army needs efficient operators in Signals, Artillery and other units, the Navy can take many also. An intensive recruiting campaign is progressing, and NOW is the time when the

W.I.A. must put its shoulder to the wheel and push wholeheartedly towards the achievement of the campaign objective. Every vacancy in the Army and Navy ranks that needs an operator could be filled from the Amateur ranks, and only when we know that all three Services have all the operators that they need, let us tackle the matter of a National Emergency Corps. It will possess great value, make no mistake, but at the best it is a third line of defence. It can improve Hams' operating ability, but it cannot teach them Service Procedure; it can provide a body of men who can operate efficiently, but a body of men who will still need intensive Service training. In the preparation of the proposed national register it will be of real value for the Defence heads to know that there are the members of the Emergency Corps available for training without at first having to call on any operators from such essential services as the P.M.G. and the Railways. Yes, such an organisation will be of real value, but first let us tackle the more urgent problem. The Institute must align itself with the recruiting campaign immediately. Divisional Councils should have available for members the names of the units in which vacancies for operators exist. Members! It is up to you; do your Hobby and your Country a service that will never be forgotten. Prove that your Hobby is of such strategic value that it is deserving of every possible privilege in perpetuity.

The Editorial Committee would be pleased to receive from our various notes correspondents the date each month their section holds its monthly meeting. We intend to head our notes section with this information, as we feel that visiting members would possibly like to come to section meetings when in their respective capital cities.

## Switchings in the Super

(By Geo. Ryan, VK4RG.)

The line-up of the super here is as follows:—Two 6D6 r.f. amplifiers without any regeneration; 6L7 mixer with 6C6 high frequency oscillator; two 6D6 intermediate amplifiers; 6B7 using one diode for detection, the other for a.v.c., while the pentode section is the beat oscillator; the triode section of a 75 is the first a.f. amplifier; 6A6 paraphrase push pull driver, and a pair of 2A3's in the output feeding a 12 in. speaker in an acoustic labyrinth baffle. A magic eye (6G5) is also included as well as band switching although coils for twenty and forty are the only ones to be installed so far. With this line-up the super naturally gives a good performance and has turned out to be a very satisfactory job indeed.

The switching arrangement was designed to cut out beat oscillator switches, send-receive switches, etc., as well as a few other jobs and in practice has proved to be worth its weight in gold in the way of convenience and cutting down the number of controls on the panel. A Yaxley two bank switch is used here, and in this make of switch each bank has two moving arms which move over five contacts each, thus making in all four five-position switches. In the first position of the switch the high tension is cut off; in the second, the grid of the first r.f. amplifier acts as a diode and is connected through to the audio end to make a monitor for phone work; in the third position the audio amplified is connected out to pick-up terminals; in the fourth position the super becomes a normal receiver with a.v.c. for phone work; in the last position the a.v.c. is shorted out and the beat oscillator cut in for c.w.

How all this is accomplished will be seen from the accompanying circuit diagrams. In the first position of the switch section one of the bank opens the centre tap of the high tension secondary and cuts off the receiver. In the second position the first section closes the centre tap and

turns on the high tension. The second section of the switch is in the positive lead to the plates and screens of the r.f., i.f., mixer, h.f. oscillator and beat oscillator and in the second position is open. The third section of the switch connects the grid of the first audio tube to the .5 meg leak and by-pass condenser in the grid return of the first r.f. tube, the grid of this tube acting as a diode detector. The fourth section of the switch is open since there is as yet no plate voltage on the beat oscillator.

In the third position of the switch the first, second and fourth sections of the switch make the same connections as they do in the second position, while the third section connects the a.f. amplifier to the pick-up terminals.

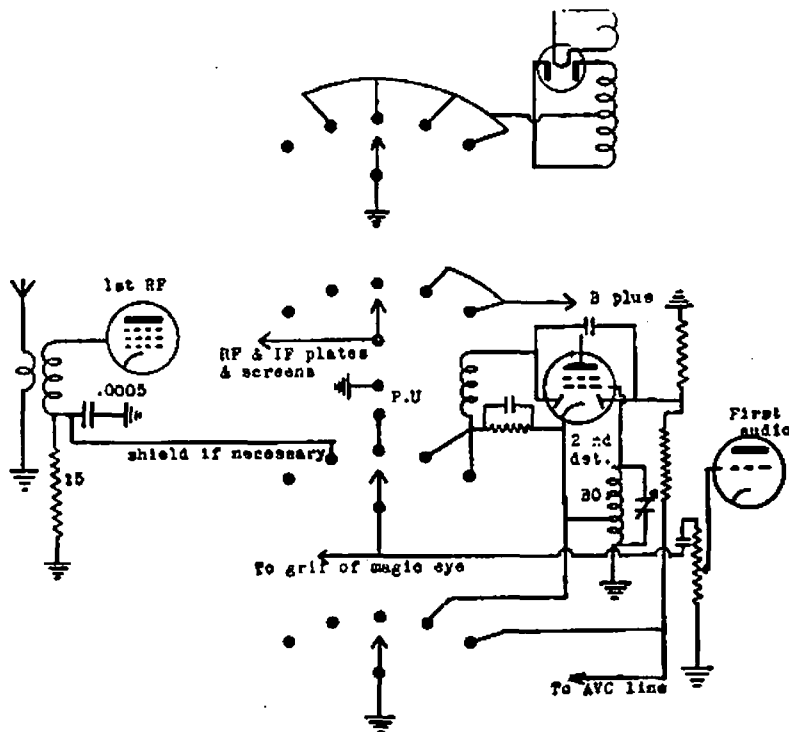
In the fourth position, the first section makes the same connection again; the second section connects the high tension to the r.f. and i.f. tubes; the third section connects the a.f. amplifier to the second detector diode load resistor; the fourth section shorts the beat oscillator cathode to earth and stops it oscillating. Beat oscillators usually run at low plate and screen voltages so will not be damaged when run with no bias on them as is the case when not oscillating.

In the fifth position, sections one, two and three make the same connections as they do in the previous position. Section four removes the short on the cathode of the electron-coupled beat oscillator and instead shorts the a.v.c line to earth.

I think this about covers the switching, and if it is adapted to the particular type of super in use, no snags should be encountered, although a few remarks on the grid leak and condenser in the grid return of the first r.f. tube are perhaps called for. On the super here the a.v.c. operates on the intermediate stages only, the r.f. stages being run

flat out all the time for maximum signal to noise ratio. If a.v.c. were used on the r.f. stage the decoupling resistor in the a.v.c. line to this tube could be used as the load for the diode when the set is used as a monitor by making section four of the switch, when in the third position, connect the end of the resistor nearest the a.v.c. diode to earth. The normal .1 by-pass on it would have to be considerably reduced in size to make it a suitable diode by-pass. However I would not say it was the very best practice to use a.v.c. on the r.f. stages of a ham super—in fact I think the majority of them have regenerative r.f. stages. In the case of

A few comments on the magic eye may be of interest to the readers of "Amateur Radio" and I can certainly recommend its inclusion in any ham super. It has come to be looked upon by most hams as something they put on bcl sets to make them sell better, but I find it invaluable in many ways. Firstly it makes an excellent R meter at about half the price of an ordinary meter without any of the worry of finding the best place to put it in the circuit and making it dead beat, etc. When one becomes used to the readings it gives, quite an accurate signal strength report can be given from it. Also, it is a great help in checking up on



such regenerative r.f. stages it will of course be necessary to use a separate regeneration coil instead of taking the cathode to a tapping on the coil. Otherwise the plate current of the tube would be flowing through a .5 meg resistor! My super has all tuning condensers ganged and it was found that the inclusion of a .0005 condenser in the first r.f. tuning circuit upset the tracking to a fairly large extent so a similar condenser was included in each tuned circuit to overcome this difficulty. Tracking should not be a source of worry on the average ham super which, I think, has one regenerative r.f. stage which is not ganged with the mixer and oscillator.

modulation. Overmodulation is indicated when the eye closes on peaks, while downward modulation is present when the eye opens on peaks. On my super the grid of the eye is connected to the moving arm of section three of the switch so that it is in operation both when the set is used as a receiver and as a monitor. When the switch is in the monitoring position the eye gives an indication of one's own modulation as well as being a useful field strength meter.

# Monitor' Your Phone

(By "The Sky Raider.")

One of the greatest problems facing the average ham to-day, is that of interference. The technical progress in the past few years had made it possible to build stables transmitters, taking up but little space in our crowded spectrum, but a necessary feature in obtaining operating stability, in the careful adjustment of the transmitter under load, with constant monitoring. The load employed in about 99 cases out of 100, however, happens to be the most logical one, the regular antenna system. The Q.R.M. caused thereby is of serious proportions. Moreover, the widely prevalent practice of warming up the transmitter under load, and of experimenting with different arrangements, also with the transmitter loaded, contribute their full share to the present day Q.R.M. Although the method in general is highly commendable, the load employed should be a non radiating one.

Besides effecting a great saving in the wear, and tear on the vocabulary of the fraternity, the dummy has other uses. As long as your transmitter doesn't radiate, you are bound by no regulations. So if you wish to see how your transmitter will behave at such and such a frequency, or you wish to test out your phone with a gramo record, reach for your dummy antenna.

## How a Dummy Works.

Alright, now lets see what makes the wheels go round. As far as the transmitter is concerned, the antenna system is nothing but a closed cir-

cuit containing reactance and resistance. When the antenna system is in resonance with the tank, the reactance is close to zero, and the resistance is mainly "radiation." Now, if we replace the antenna system with a closed circuit containing very nearly the same values of reactance and resistance, the transmitter will continue to oscillate merrily on, all unsuspecting. The resistors in a dummy antenna must be large enough to dissipate the R.F. power output de-

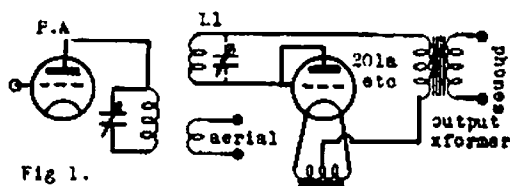


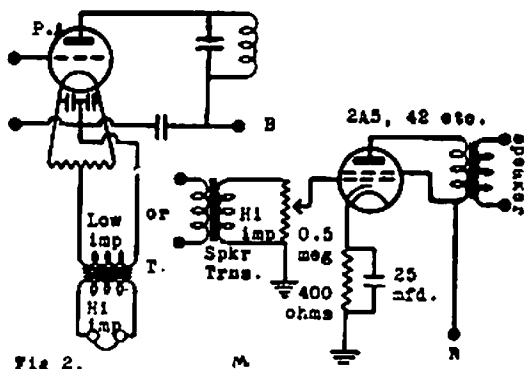
Fig 1.

livered by the transmitter. One of the most satisfactory types of resistors for amateur work is the ordinary incandescent electric lamp. Other non-inductive resistors of sufficient power, dissipating capacity can be used.

I do not propose to go into details of a dummy antenna here, because most of you have handbooks, and quite enough information is contained therein. Besides, I would only be going over old ground! I will, however, give details of suitable phone monitoring systems I have tried at different times, and can guarantee them to work o.k. Monitoring is simple and straight-forward. The regular monitor is used in the usual way, except that it should pick up the signal from the "dummy," and



not from the tank. For average power, bringing the monitor into proximity with the dummy probably will prove sufficient. For lower power a closer coupling may be obtained by a single wire, one end in the neighborhood of the dummy, and the other end in the vicinity of the monitor. A system of continuous monitoring is shown in Fig. 1. It is undoubtedly familiar to all, and works well. It consists of a vacuum tube linear rectifier coupled to the antenna circuit, and feeding a loud speaker or head sets through an output transformer. For average use a 201A



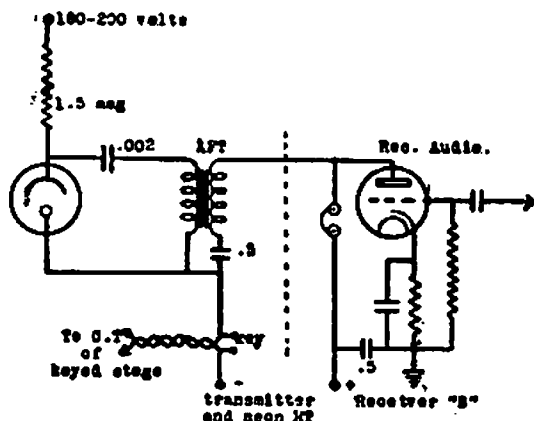
with grid, and plate tied will rectify sufficient power for head phone operation. A type 81 rectifier will provide more volume. L1 may be tuned to the tank frequency if desired.

The system in Fig 2. is excellent, and functions by picking up a small amount of audio voltage from the filament C.T. of the final amplifier, and feeding it into a pair of phones, utilising an ordinary output transformer of the type used to feed a dynamic speaker for the purpose. Feeding the output of this monitor into a 2A5, 42 etc., a loud speaker can be used and used to full advantage.

Now then you phone hounds, roll up your sleeves, and build yourself a dummy antenna, and a monitor, you can then pump out records, etc., to your heart's content, without cluttering the air.

## A Novel Monitor

A very simple method of coupling a conventional neon oscillator to the receiver earphones in order to monitor keying, is shown in the diagram. No relays are required, and the only switch necessary is of the ordinary toggle variety used to cut off the plate supply to the receiver whilst transmitting. Excitation voltage for the neon oscillator is supplied by tapping on the voltage divider in the receiver power pack. The keying leads from the oscillator may be connected in parallel with those running to the centre tap of the keyed



stage. Should the neon bulb continue to break down when the key is up the oscillator leads to the key should be reversed.

.....

Roger Hathaway, W1RY, of 33 Maple Street, Taunton, Mass., U.S.A., marks down the following VK's as not keeping their promise to QSL:—2EL, 2MT, 2KS, 2AE, 2FM, 2DA, 2UD, 2JN, 2ADY, 2ZH, 2JX, 3UJ, 3TU, 3EG, 3GQ, 4WT, 4AP, 4BB, 5SU, 6KL, 5LY, 5FM, WJ, 5RD, 6AA, 6FO.

.....

## Correspondence

"Willow Point" Station,  
Via Wentworth,  
(River Darling).

The Editor, Amateur Radio.

In view of the recent discussions on antennae, the "V" Beams in use here may be of some interest.

As you may guess by my location, I have to be content with QRP, using 5 watts CW and 4 fone. But I have plenty of room to put up arrays, which to a certain extent (?) minimise my handicap.

The first beam put up is directed on "W," and is quite conventional in design, having 276ft. in each leg and 35ft. high. The great difference from any other that I have heard of lies in the material used. I didn't have sufficient copper wire here, but plenty of fencing material, so tried that (14 gauge soft galvanised). Feeders are Zepp of 16 gauge enamelled copper. The results were most gratifying. I worked more W's in a fortnight than I had ever worked previously (54 in a week). And worked them hours earlier than I had ever done before. The average report is one point higher than with my old Zepp (several R8), and the readability is vastly improved. The 4 watt fone has been copied in W on both 40 and 20 mx. But so far have not had a straight fone QSO with the U.S.A.

A good instance of the benefit derived is that in the Senior DX Contest I worked 17 Yanks with only two reports under QSA, 5 and up to R8.

Now the European, Asian and S. American beam is up. It is not so elaborate as the other, being only 15ft. high at the ends. I have made it 277ft., which gives a slightly better average current rise over the 20 mx band.

The gain with this was immediately noticeable. I had never been able to work an Asian before, but worked two countries there the first day it was up.

I still have to give this antenna a thorough try-out, but this morning worked I IMH, being the first European raised here in the morning, although I have tried often enough before.

The rig used is a 6V6G E.C. osc., link coupled to an 807. The 6V6G has approximately 58 volts on the plate from "B" batteries (input .6 of a watt). The 807 is powered from a vibrator (220 volts). And is plate modulated for fone use, when needed, by a 19 used Class B, driven by another 19, the two sides in cascade, transformer coupled. The modulator unit running from 135 volts B battery.

I hope the fact that fencing wire seems to be quite a good substitute for the much more expensive copper will be of some benefit to other hams.

Yours with 73,

R. J. WHYTE, VK2AHM.

P.S.—Since writing the above, have worked an LU and a ZS for W.A.C. So am now more than satisfied with the two antennae.

To W.I.A., F.H.Q.,

Dear Om's,

Will you be good enough to publish in your official organ the following notice: The QSL Bureau of the Reseau Luxembourgeois de Amateurs d'Ondes Courtes, Luxemburg section of the I.A.R.U., has been receiving lately a great number of QSL cards from foreign Om's addressed to LX stations confirming QSO's in CW. In this country (Grand Duchy of Luxemburg) there is not one single LX station working actually in CW, and the so-called LX stations in CW which have been heard are simply foreign pirate stations having usurped LX calls.

With my very best thanks.

Yours very truly,

(Sgd.) J. KESSELER, LX1A1,  
Secretary of the R.L. Reseau Luxembourgeois.

## New Taylor Release

### A Taylor Beam Amplifier Tube 6 Prong Isolantite Base.

The T-21 is Taylor Tubes' answer to the demand by hundreds of Taylor Boosters for a Low Power Beam tube. As indicated by the characteristics, the T-21 is extremely easy to drive, and many circuits for its operation are shown in the Taylor rigs described in this manual. The plate dissipation rating of the T-21 is 21 watts, and no colour will show on the plate when operated at and within this rating. Plate dissipation in excess of this rated value should be avoided.

#### General Characteristics.

Heater Voltage—Volts ..... 6.3  
 Heater Current—Amps ..... 0.9  
 Plate Resistance—Ohms ..... 22,500  
 Mutual Conductance— $\mu$ Mhos 6000  
 Amp. Factor ..... 138

Max. Plate Dissipation—Watts ... 21  
 Max. Screen Dissipation—Watts, 3.5

#### Physical Characters.

Max. Length, inches ..... 5 3-8  
 Max. Diameter, inches ..... 2 1-16

#### Interelectrode Capacities.

Grid to Plate, mmf. .... 1.4  
 Input mmf. .... 11.5  
 Output mmf. .... 11.5

#### Class C Amplifier.

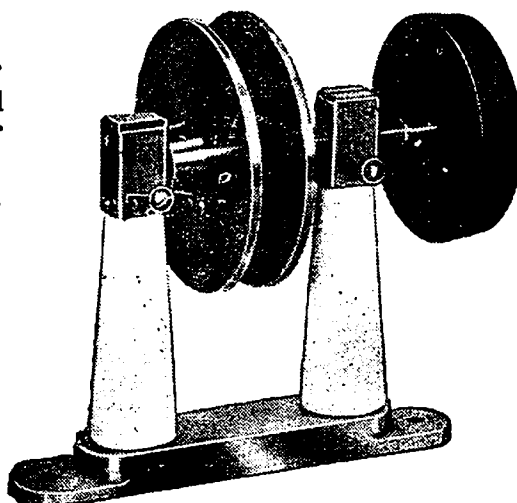
\*Max. Operating Plate—volts ... 400  
 Max. DC Plate Current—  
     Telegraph ..... 95 M.A.  
 Max. DC Plate Current—  
     Telephone ..... 65 M.A.  
 Max. DC Grid Current ..... 5 M.A.  
 D.C. Grid—volts ..... -45  
 Max. Driving Power—watts ..... .4  
 Max. Screen Current ..... 16 M.A.  
 Max. Screen Voltage ..... 300

\*It is recommended that plate voltage be reduced to 300 volts at frequencies above 30 MC.

## SPECIFIED!!

- 1—Recommended by VK2GU for 56 and 28 mc. plate and grid tank tuning. (See October "A.R.")
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## VK3MR's DX Notes

Season's complaints, chaps! Hope you all have recovered from the holidays. Our grumpy editor hasn't yet. Can't make it out, but he seems put out because he had to pay for his own Xmas present! (Sad tale, too.) In future these notes will be divided into phone and cw as dx on fone these days seems to be a well established art, so different from the good old "daze" when it was a thrill to work a station on cw then switch to fone! Which reminds me of ex-VK3WL who used to work HB9Q every a.m. on 7 mc., using cw. Jack asked the HB to stand by while he tried his fone, which consisted of placing a coil of a few turns in or near the grid coil of the TPTG osc. and bawling into the mike. When asked if he heard anything, the HB said, "Sure, and if you yell any louder I will be able to hear you direct!" Those WERE the days!

CW.—It seems that dx is only being worked on fone these days, judging by all the missing letters received this month! Of course, the cw man will tell you that there isn't any rare dx these times, and that he has worked it all long ago—but I don't know so much. 3KX has forsaken radio for fishing now, so no doubt we will be hearing all about the rare ones that got away owing to line qrm!

Fone.—The newly appointed Western Zone President, 3HG, is doing some good work on fone, using low power, and he is just another who declares that the Vee beam ant is the bee's knees! He has two of them, using three waves per leg and finds that the strength from both ends is about identical now that he has put the open ends almost horizontally. Worked 83 countries, and has only 65 verified. Has anybody been able to work CN1AF? He uses fone on 14150 kc.

A visit to a country station, 3BM, discloses some startling facts. Bruce, as is generally known, only uses

fone as he has forgotten the code (so it is rumored, although he reckons he can't get his BFO to osc.) There are ants to the right of you, ants to the left, and ants all around the country; in fact, the best part of that part of the country is under copper wire! After popping a few questions, the following facts were gleaned:—The main stick is 120ft. 8½in. high, just beating 3GV by 8½in. (how could you, Bruce!) From this pole hangs 4 Vee beams ½ wave 7mc. doublett, ½ wave 80mx. ant. These are held up at the other end by 6 33ft. sticks, 2 tress and 2 60ft. masts! Including the feeders, there are 6850ft. of 4-g. copper wire!! It took 2 cwt. of guy wires to defeat Nature and maintain the masts in a vertical position, and 1½ gross of hd. strain insulators. That's only some of it, and more to come. I wonder what Bruce would do if he had to follow in the fatal footsteps of his partner in crime, 3KR, the ex-big noise of Kerang! 3BM can be rightly called the 6ITH of VK if that means anything. The coverage of these ants speak for themselves, and he is mostly considered to be the loudest VK in all continents. The gain of his beam doublett. VP7NS, 14080 kc., is a newcomer, and his address is Box 374, Nassau, Bahamas. Some of the S. American fones worked from 3BM include HK1AG, YV5AB, LU4BC who uses 2800 watts!! LU5CZ and OA4C. These are no trouble to him, although his beam seems to let him down on Brazil. These stations down in the south of VK are always very hard to contact, and mostly have that washed out sound as if they are sorry to be there.

.....

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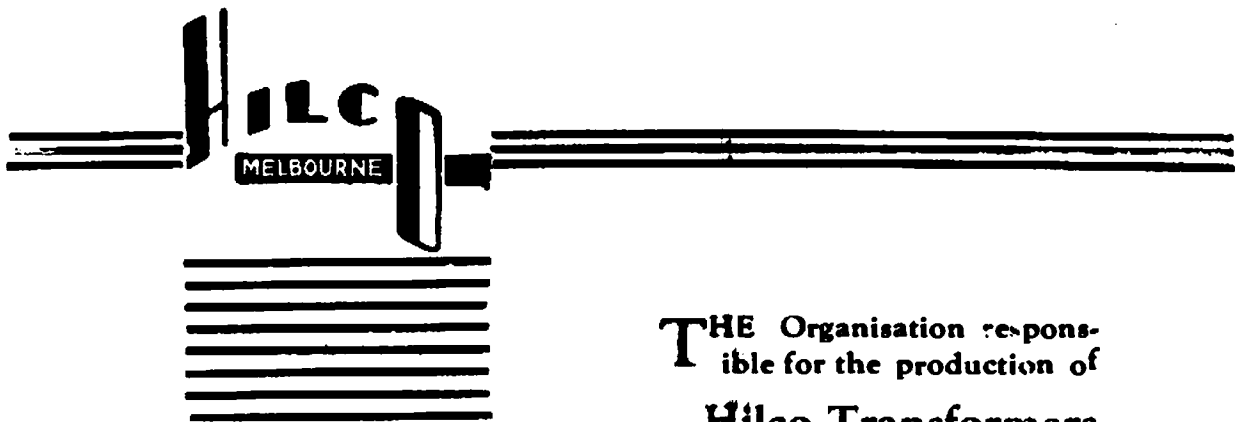
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## 28 and 56 M.C. Notes

(By A. Pritchard, VK3CP.)

Conditions on 10 metres seem to have passed their peak, although signals from the States are not affected in strength, but do not come through as early as the previous months. At present the signals come through at 6.30 a.m., with approximately a three day interval for that time. The Europeans are not at their best during the times around 9 p.m., and the best time for contact is after midnight. At 3BQ, G6WT was r8 on phone at 12.30 a.m. on Saturday, 17th, contacting W's. VK3IW is working most of the DX in VK3, some of the best being PY2AK, XZ2EX and contacts with K6BNR, as late as 9 p.m. keen Bern. on 10 mx. PK2WL is a new station. and gives us excellent phone. The rig has a 42 in the co, 802 doub. 10 3ET final with 75 watts input and modulated by Class B 46's. The an-

tenna is a big Zepp working on the 8th harmonic. The 2 full waves long Zepp makes a good general coverage antenna for 10, and takes a lot of beating for a receiving antenna on 5 and 10. VK3CZ is rebuilding for the last time (hi!), and has the gear all ready for wiring. The outfit has three long shelves one above the other. The bottom carries 6 power supplies, the middle the modulator and bias, and the top all the RF gear. The modulator has a D104 xtal mike into a 57, 2a6, 56, PP2a3's into Class B 809's. The RF section has a 2a5 co 40x, 807 doub., 809 buffer and PP 800's in the final. The final tank condenser is the disc type Eddystone recommended by VK2GU in his article in "A.R.," "Power Tuning Condensers for Ten and Five." October, 1938. When on 5 mx Arthur will use a 20 mx xtal and



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the same line up. By next month 3CZ should be busting the ether!! VK3BQ and 3YP (yes, he is coming back soon) have improved their receiver with the 1851 tubes in the rf stage, with remarkable increase in signal strength against noise. On Sunday, 18th, at 9 a.m., W1CND was contacted here, and his line-up should be of interest. The antenna has a reflector director with Y matching feeders system with 56in. in each leg of the Y and two directors, giving us r9 signals when all others on the band were r4. The RF section has a 6L6 co, RK 25 doub., RK 25 buff., 2RK 47's and a final with 2 HF300's. The modulator has 6c5, 6N7, 2 6c5, 4 2a5's PPP driving another pair of HF300's in Class B. Increasing their power input from 400 to 800 watts only took the 1r quick fade out of the signal. The formulae given in last month's notes for the ref. dipole dir. beam was used here at 3CP in constructing that type of beam, and the results are all that could be desired for a beam, giving tremendous gain in the desired direction and reducing the local signals to r3. It seems to be good on the receiver also on 5, giving 3VA in Elwood r7 signals here, from his excellent xtal controlled carrier. VK3YL has perfect 5 metre signals and Austine uses xtal controlled output, the line up being 6L6 from 80 mx xtal, 6L6G doubling to 10mx, 809 reg. doub. final, modulated by a pair of 6L6 tubes (Efficient doubling to 5 metres, 3CP, Nov. 37, A.R.) The above mentioned doubling circuit is in operation here at 3CP, using one of the new Taylor T40 tubes. The feed back requirements are much smaller than required for 801's or similar tubes, so that an extra condenser across the grid tank may be necessary. The T40 dips at resonance from 400 mills to 40 with a half-inch arc off the tank. Link coupling, 1 turn, is used to the antenna tank which has 6 turns 2in. diam. well spaced and loading the doubler to its rated 115 mills.; Class B 801's are used as modulators. There are many perfect xtal controlled signals on 5 now, so that there is every reason to expect interstate contacts if conditions are suitable and the few remaining ac hash-wobulators do not spoil the chance.

Talking of 10 mx, the only interstate VK's heard here this last month are VK4JP's r8 phone; 4HR r8 cw.; 3ZD, 3SG and 3EX are new to 10, and doing very well. The lastnamed is using a single 210 in the final, and his cw signals are fb. Don't forget, chaps, notes before the 18th.

## Federal and Victorian QSL Bureau

(R. E. Jones, VK3RJ, Qsl Manages)

OZ4LM, Sv Funck, Lange pr. Martofte, Denmark, loudly bewails the lack of qsls from VK and ZL, particularly VK2ADE, VK2CC and ZL1FT.

A mast 50ft. of 3 x 3 Oregon, painted and with base, bolts and gyes was to be had for the taking down and carting away from VK3OV. Before his generous offer could be published the recent cyclonic winds brought down the mast and wrecked it.

Cards from OK2PY state that his was the sole OK call used in the recent VK-ZL test, as all other OK stations were closed by the military authorities. In an arrogant propaganda letter he states his was the only station in Sudetenland, and that of 400 amateurs in Czècho only 7 Germans were able to obtain licences. He states that in all probability, Hans and Fritz, OK2OP and OK2OM, may never again be heard on the air.

Bill Holland, VK9BW, WAU, New Guinea, has generously undertaken the distribution of cards for New Guinea.

An old station we are pleased to welcome back on the air is that of VK3FG, Fred Ince, of Caulfield.

Passing through Melbourne recently on his first seagoing trip as 2nd operator on the "Mercur" was E. Brandon, VK5FB.

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## Amateur Radio

VK3UX recently sustained a badly cut finger. Trust OK again now, OM.

Jack Anderson, VK3JA, visited Melbourne recently to recuperate after a successful appendix operation.

VK3JG, recently VK3KI, writes of the trials and tribulations of the North, and sends his 7 $\frac{3}{4}$  to VK3KR. John is anxious to know when Ken is going to do the deed, and looks forward to the day when he can see Ken doing a spot of pram-pushing.

Who would live in Glen Iris? Bill Shields, VK3GP, has six active hams all using their allotted power within 400 yards.

Glad to hear from an old-timer in Jeff Borden, ex-W1CMX, of Touisset, Mass., U.S.A. Jeff and brother Doug have kept the antenna aloft for many a year.

Gordon Weynton, VK3XU, expects to renew old acquaintances du-

ring a trip to Adelaide over Xmas. Gordon is pleased with his score in the Junior contest, and expects to be on C.C. on 56016 kc. early in 1939.

The wily Scot from Warragul, Mac, 3XZ, writes of local gossip. Mentions that 3ZJ has gone from 3UL to 3SR to relieve for vacations. Mac and Murray, 3HZ, have been busy building field strength meters and searching for the perfect linear detector.

LY1J and LY1S have been appointed President and Secretary respectively of the newly formed Association of Lithuanian Radio Amateurs. Tracing the growth of Amateurs in Lithuania, LY1J mentions that there are now 45 licensed amateurs who send their good wishes to VK Amateurs.

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### Western Zone Convention

The spirit of ham radio was very much in evidence at Colac on the week-end of the 26th and 27th of November, when the first dinner and convention of the Western Zone was held. Over thirty hams were present, including the Victorian president (Mr. Gronow), several members of the Council and other metropolitan men, as well as visitors from both the Northern and Eastern Zones.

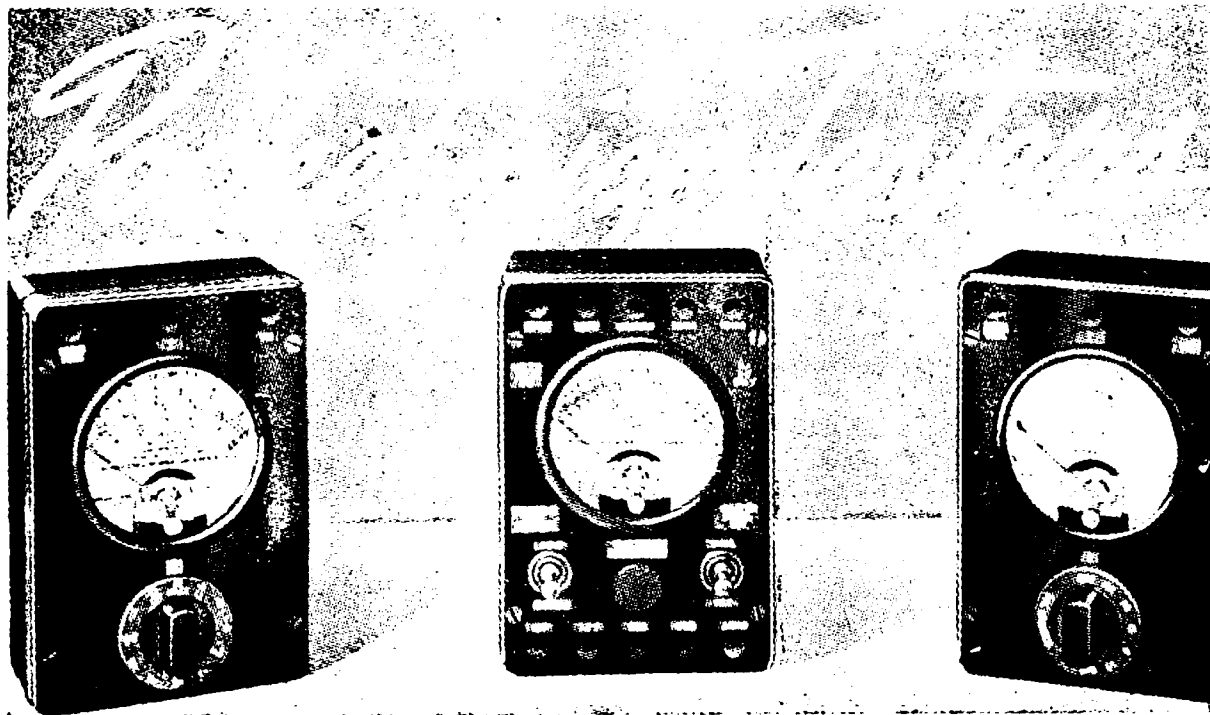
Proceedings commenced with the dinner at 6.30 p.m., and after the toasts of the W.I.A. and Western Zones, a very interesting talk was given by Mr. L. Simpson (VK3II) on his experiences in the Flying Corps during the year. This was acclaimed as the tit-bit of the convention.

Then followed the election of office-bearers for the Zone, Mr. N. Templeton (VK3HG) being elected president, and Mr. G. Wells secretary and notes correspondent. The rest of the evening was taken up with discussion on matters of general interest.

On Sunday morning points of interest around the town were visited, including the shack of VK3KX one of VK's renowned DX men. 3JO and 3DH had a five-metre transmitter in operation on a hill near the town, and were successful in contacting one of the local stations. Most of the gang spent a lot of time scouring the district trying to locate this transmitter, but without success. After lunch the different parties began to leave for their respective homes, and a very successful convention came to a conclusion.



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## Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 15th of the month preceding publication.

### N.S.W. Division

#### ZONE 5 NOTES.

(By VK2IG.)

Condx on most bands appear to be better for all round DX though W stations have fallen off. Some nice DX in FU8, ES and VQ2 being easy to contact.

2OJ.—Been pretty qrl, but on fone occasionally and going fb.

2AP.—Reckons condx not so hot as likes to keep his W skeds.

2QE.—Silent and busy.

2VK.—Had a rush trip to Albury, but has returned to his ship again.

2EU and 2QD—Still talking about ships, but only for local work. What about some local xmission, O.M's.

2IG.—Still off the air; is still in hospital in VIM with his optic.

Now for Waggaites.

2AEO—Been hunting up the DX, and has worked TF3C, ES, VQ2, HH, FI8, FU8, K6OVN. There is a rumour he is to be transferred. He says he'll miss the cow that runs a magneto by the hour and also the H.T. interferences. Well, Poly, distant fields might look well, but might be full of thistles, hi!

2AIB.—It's also rumoured that Allan is going to migrate, and also 2FQ. Wagga will be empty soon.

2AID.—Had to borrow a 3-ton truck to cart his new gear back home. Has the 809 perking well, and believe he wants to sell his galloping bedstead. Sounds like another 809 going in!

2FQ.—Been for spell to Sydney, and as mentioned before may be leaving Wagga.

2YW.—On on Sundays, but not heard much. Qrl YL, eh!

2MP.—Flash! Someone saw his number plate passing at 55 m.ph. Presume the rest of the crate was attached and 2MP at the wheel. Is supposed to be going 5 metres.

2GT and 2AIB.—Testing on five, and hoping something might happen.

2LM, of Leeton. — Sometimes heard with fb. fone on 40. What about that dope on ur rig you promised us, Mac.

The above applies somewhat to 2FZ, of Lemora. What's the dope, ob?

2JL.—Does a bit on 40, but tis said he's busy rounding up grasshoppers in his spare (if any) time.

2KD and 2KQ—Very busy keeping quiet, and seemingly doing nothing pretty thoroughly. Is that right, fellers?

Also 2LL.—Ditto, repeato!!

2BW.—Going very nicely on 40. We hope he rounded up that pirate.

In regard to DX. Hams please note that VQ2MI is a consistent one and an ex-VK3, being from Cook's Point or Point Cook and Stawell. He is on Saturday nights from 11.30 to 12.30 our time, and frequency about 14375 Kc. Also two other VQ2 about then, but on 14,410 Kc. VQ2MI Qsl's O.K. as 2IG has received his card.

#### ZERO BEAT RADIO CLUB NOTES.

Pursuing its policy of progressive instruction for A.O.P.C. aspirants, the Z.B.R.C. has inaugurated a system of practical demonstrations to accompany each lecture of the A.O.P.C. syllabus. This method both enlightens and interests the listener and imparts a better understanding on the subject.

# Amateur Radio

A library has been in existence for some months, and provides a source of information for the A.O.P.C. candidate and ham.

Morse practice is conducted every Friday night from 7 p.m. to 7.45 p.m.

An event of the month is "Ham night," which features discussions of interest to hams and members. On these occasions 2IQ and 2AFQ discussed some interesting topics, which were well received.

The 25th September saw the 18th Field Day held at Jannali. Two transmitters were in operation — 2AEE and 2AFQ, both on 3.5 mc. The searchers were required to find 2AEE first and then 2AFQ. During the afternoon 2AFQ worked 2AX on 7 mc. fone.

On the subject of field days, Z.B.R.C. welcomes all those interested, and particulars may be had from the club or by contacting any of its ham members.

Morse practice and club news is transmitted from club's transmitter, VK2ZB every Friday night from 7.15-7.45 p.m., frequency being 7120 kc.

A new receiver is under construction for the club, and with its completion qso's will be established with other stations.

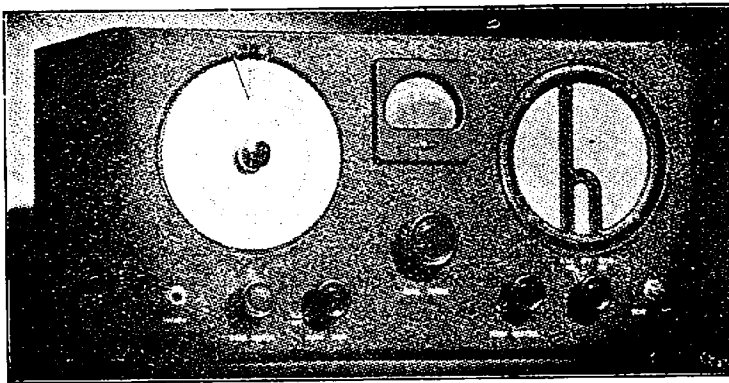
2AEE.—Trying to get down on 56 mc. in between experimenting with portable gear.

2AFQ.—Has 56 mc. well in hand and hopes to be QRO on that band shortly.

2IQ.—Also carrying on the good work on 5 metres with 2AFQ. Sometimes heard working W's on 10 metres.

Both 2IQ and 2AFQ conduct Morse practice frequently on 20 metres on Sunday mornings from 10-10.30 a.m.

2ABH.—Active on 20 and 40 metres when P.A. is not in demand.



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# Amateur Radio

2AJO—Attention centred on 40 mx fone, also transmits Morse practice for the club on Wednesday nights.

2KH.—On CW mostly; has the new rig perking well.

2AEN—Experiencing trouble with power supplies. An E.C.O. adherent.

2AIY.—Can't decide which to put in—xtal or E.C.O.

In concluding the Z.B.R.C. wishes all a Merry Xmas and Happy New Year.

## COALFIELDS NOTES.

(By VK2KZ.)

VK2KE.—Nothing to report from you again, OM, but understand new year will see you active.

VK2YO.—Has just returned from a month's holiday feeling A1, leaving 14 mc and returning to 7 mc, using fone only; little to report on you, OM.

VK2KZ.—Nothing doing in radio over a month now, but will most likely be on in new year.

VK2PZ.—Working 7 mc only, waiting on 809's for a high frequency line-up; good to hear you going again, Chris, after the qrl.

VK2CW.—Working 7 mc also, busy in many ways, but trying an "R" meter on his super.

VK2KQ.—Has left 80 metres due to qrm, now on 7 mc fone; likes a good yarn any time, so give Jack a call.

VK2YL.—As active as ever, using 14 and 7 mc phone and CW, also listening on 10 metres, hearing some choice DX at times. Yes, don't forget the visit, Harry.

So that's all gang as news is scarce this month. Merry Xmas to everyone and good luck.

## WAVERLEY RADIO CLUB NOTES

(By 2AHJ.)

After an absence of several months, VK2BV, the club's station, is back on the air regularly. The usual wags associated with new rigs are being experienced, but these

will soon be cleared up, and the club's signal should be conspicuous on 20 and 40. The arrival and operation of the new rig has created much interest among those members who are not yet hams, and code practices are the order of the day. Incidentally, new members, hams or otherwise, are wanted, and are invited to join in the future code lessons.

Congratulations to a new member, VK2ALC on securing his call! Grev is ex-VS4CS in Borneo, and is getting well under way with 20 mx



The New Transmitter of the Waverley Radio Club.

fone. Also a new member is Frank Burke, several years an enthusiast, and now aspiring to ham ranks.

At the weekly meeting on December 6th, a very interesting lecture was given by 2ABS, and the subject was his recent visit to Central Regional Station 2CR. Jack gave many very interesting details on the gear and power used. My! My! What cudn't we do with 10 K.W. in the antenna.

A pleasant day was spent on 4th December, when several of the

# Amateur Radio

members held a picnic at Harbord Beach. The best part was the sun-baking. Ask Bill Stanley — he couldn't forget it for a week.

The library is proving a very handy addition to the club. Dozens of back copies of QST's and technical booklets are kept for reference, and are available to members. Bill Stanley is doing good work as librarian.

2AFZ lately interested in 20 mx., and is hrd there at times, mostly QSO tests wid 2FU. Other times replaces C.T. resistors in P.A.

2AHJ interested in improving efficiency of rig on 20. Is usually greeted by 2ABS with such remx as "Hw's ur no load dip?"

2AFG, having completed 3 years research on a coil winder is dividing his attentions till 1940 between dissembling rig and completing 2BV's code oscillator. Also believes in gng to bed. Fancy!

2MQ completing work on new 5 mx rig, which should soon be puttin' out.

Geo. Preece, Bob Ball and Col Paterson all at the stage where devoted parents shake heads and mutter "Cranx." Col passes hours 2nd op-ing at 2AHJ.

2TN appointed W.I.A. representative, and is quite keen on new position. Ivon also migrating to 20.

Included is a photo of the new club transmitter just after it was installed. All shelves will eventually be filled when fone is used and a QRO final is added.

How about paying us a visit, you enthusiasts, and giving the rig a once-over. Believe me, there's plenty to interest you. The club-room is rear 13 MacPherson street, Waverley, and meetings are held every Tuesday evening at 8 p.m.

## Victorian Division

### KEY SECTION NOTES.

Einstein to the contrary, time does not stagger back, and when you read this the season of sunburn, holidays, plum pudding, gift ties and cigars will have slipped by, and your correspondent can only belatedly wish you all the best for the New Year. May your supers all line up first try, and your transmitters put more RF into the aerial than you ever fondly hoped.

And so to business. The December Key Section meeting saw a good rally, my good self being among the late arrivals, having had to wait for MR to complete a big round-up at the ranch. The old maestro's Shorthorns had made a bolt for the freedom of the range, and Snow, astride Old Faithful, the antiquarian bicycle, gave a spirited performance and eventually had the rebellious herd safely behind the rails. A versatile boy, this! (Tasmanian papers please copy.) Incidentally, MR, in the company of DT, KR and one or two more of the lads, took the wrong turning on the way home from the Colac convention, and

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spent some hours at that rendezvous of bathing beauties and blondes, Lorne. Accounts of what happened there are conflicting, as are also reports generally on the convention itself, but the gang can be relied on to be in all the happy fun games and undoubtedly a good time was had. Left at the barrier was DP and EB, whose car developed angina pectoris or some similar ailment, which proved impervious to either kindness or cruelty. Most of the afternoon was spent pushing the so-and-so around the environs of Brunswick—but all to no avail. He just no go.

Highlight for the month for some of the cognoscenti was the visit of the flying boat "Guba" with personnel including Ray Booth, the radio op.—PK6XX to you! Your correspondent has it on the best of authority that Ray is also an ardent astronomer, and is a keen student of heavenly and celestial bodies. Melbourne should offer every advantage for a furtherance of the study — although perhaps it's a bit early in the season. Apropos to this visit UM's wail for the month covers "that trip to Colac in the uncovered waggon, the NFD mosquitoes, flies and cold at Arthur's Seat, the party at QK's for PK6XX, his return picture show, and those French 75's." Nice work!

The "Guba," by the way, has absolutely the last word in aircraft radio equipment. Positively everything that opens and shuts—remote control to all parts of the ship, and when we say all parts we mean all parts! Am hoping to get a fairly full description for "Amateur Radio" in time for this issue.

Very little regarding the NFD Contest to hand here. UK had a busy time preparing his portable, which included two transmitters, two aeriels, two power supplies and twelve storage batteries. Shades of Mayne Nickless! However, your correspondent understands that considering the limited equipment, quite a respectable score was knocked up.

Eddystone Sales and Service Deparent, ML, has been having a great time camping with a YL from VK2.

Just another of those reports about which, where, when or how we know not.

Bad luck dogged RJ, as contemplated additions have been set back by the loss of his motor bike in a bush fire at Christmas Hills. Rumor has it that the Jones bath heater could no longer take it, so in endeavouring to get rid of those unclaimed QSL's, Ray, also got rid of the bike. Shame!

Having completed a new ten tube receiver, IW found that everything except the oscillator oscillated, even the kitchen stove. Substituted the kitchen stove for the oscillator, and hey presto! everything's fine.

WAC at last—EQ.

Reports current that WG has been on. Proved unfounded.

Domini RX busy with W.I.A. classes, Italian translations and iron core IF's for crystal filter of own make. Anyone with trouble like that on his hands should be left alone. We shall do so.

Judging by some of the junk brought to the auction sale at the Key Meeting by UH, he must have found the resting place of the Ark.

A relative newcomer to 14 mc. is IK, who hopes to be doing more on that band, and will be on phone soon. Air Raider, please note!

The auction of amateur gear owned by PP was well attended by the boys, and in the prevailing excitement with true amateur spirit as much as a tenth of their value was bid for some of the choicer offerings. It appears that one transmitter was bought by a lad, who has since been making enquiries as to how to work it, and seemed surprised to learn that a licence was necessary. Well, well!

## U.H.F. SECTION NOTES.

The monthly meeting of this Section took place as usual at the W.I.A. rooms on November 15th.

Meetings are held regularly on the third Tuesday in each month at the above address. Unfortunately the December meeting will be just too late in the month to be reported for the January issue of Amateur Radio.

At the present time this section is deep in the design of an U.H.F. CW. transmitter for VK3WI, with a view to continuous operation, or at least fairly long operating periods with an automatic C.W. signal output.

The proposed arrangement so far comprises 6V6G crystal oscillator in a Tritet circuit to produce a 14 mc. output, 6L6G Doubler to 28 mc, 807 Doubler to 56 mc., and a push-pull 809 final stage. This gear would excite a vertical half wave, non-directional antenna for the time being, and for any special tests a directive beam array may be substituted.

VK3YL is heard on 56.288 mc. fairly regularly, using phone. The transmitter is crystal controlled on this frequency, and uses about 30 or so watts input to an 807 final.

VK3NB is another c.c. signal on 56.8 mc. with a good field strength.

3CP has been heard lately with a very strong signal from a regenerative doubler, final a T40 and the sig. is crystal controlled on 56.8 mc.

3OT, also c.c. on 57.172 mc., a strong consistent phone signal.

3PS, on 57,520 mc., produces a similar result from an 807 final.

The old reliable and worthy chairman of the 5 mx Section, 3JO, produces also a consistent signal on 58.3 mc. from a 6L6 final at about 25-30 watts input.

3DH is crystal controlled on 56.064 and 56.104 mc., but due to lack of antenna, or, rather, space to hang same, is not as active as might be. The final is push-push T20's with 35 watts input.

As Christmas will have "been" by the time this reaches you, we hope everyone enjoyed a Merry and Happy both.

73 VK3DH.

## EASTERN ZONE NOTES. (3PR-DG.)

3BR.—Jack last heard of in VIS on way to VK4.

3DI.—Jim has bought a new car, so won't be heard on the air very often.

3DG.—On 20 mx now and again; been blowing few 6L6G's and 8 $\frac{3}{4}$ 's.

3HZ.—Murray is heard on 40 mx. occasionally.

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3IL.—Bob on occasionally between shifts.

3IO.—Lindsay cannot get sticks to remain intact; wind taking the tops of them.

3PR.—Going to spend Xmas and New Year rebuilding xmtr.

3QB.—How is the new rig coming along, Jack?

3SS.—Keith had his rig at the Maffra Show, but the tent sprung a leak. Hi, hi!

3WE.—Bill can't work any 14 mc DX with his Vee Beam, so is putting up a rotating W8JK beam.

3XH.—Stan is putting out good fone on 80 mx and has now cleared up the BCL troubles.

3XZ.—Guess those pine trees have you beaten, Mac, as no sign of your sigs. yet. Hi!

## NORTHERN ZONE.

(By 3ZK-3HX.)

Conditions during the past month have been very unsettled, owing mostly to storms of the dust variety with the resultant electrical interference. 80 mx. seems to be holding out reasonably well, however, Yanks being heard and worked by ZL's. 40 mx. has been bad with static, and on very bad days static makes itself heard.

3TL.—With the erection of a four section 8JK beam seems to be very successful with the DX.

3BM.—Seems to have taken the title of the DX king, Bruce has added a piece to his stick in the



Some of the Hams who Attended the Colac Convention.

3GO, 3LY, 3NO.—The men who keep the Sale B Class station on the air, have no time much for ham radio; must have a full time job. Have had a new vertical ant erected at B Class, so must be getting well on with the washing.

3VG.—Not heard of late. Where are you, o.m.?

Owing to the unfavourable conditions on 40 mx we are now holding our weekly Zone hook-ups on 80 mx on Thursday nights at 8.30 p.m. and managing to get through quite well, despite the QRN, and we would like more zone members to be on the job.

vicinity of 104 feet some odd inches.

3OR.—We hope is still maintaining the OR fame. Had a visit to VIM during the month.

3JG, ex 3KI.—Is active on 20 mx with the DX. John doesn't like supers.

3EC.—Is putting out good quality fone and has, we hope, his high frequency rig in operation.

3EP.—Has been too busy to do much lately.

3KY.—Heard on 40 mx fone; quality rather good.

# Amateur Radio

3NN.—Not very active as far as we can ascertain, but heard on 80 mx with excellent quality fone.

3IH.—Still trying to improve on an all-wave, all-purpose, all-everything receiver while May carries on.

3ZK.—On nearly every night of the week except Friday, when he monitors the local talkie show.

3HX.—Has broken out again, and consequently not very active. More interested in broadcast programmes, hi!

## South Australian Division

(By VK5KL)

Well, here's wishing everyone a Happy New Year and a successful one for "Amateur Radio." Conditions have been quiet the last month, but DX is there at times for those energetic enough to wait for it. Ten metres flashes its good haul of signals now and again, and those active on this band reap the benefit of good contacts from all parts of the world. More interest should be taken by DX men on this band, and so relieve the congestion on 14 mc.

Sunday nights are still popular for ragchewing on 80 mx. for a group of locals, and can be heard regularly. VK3WE has a good signal, and has been heard working duplex with a ZL.

Now that the national field day and All-Band CW contests are over, no doubt the Xmas holidays will see a great rebuilding spasm for most chaps. A good try-out should be the B.E.R.U. tests held in February.

The weather for the 5-metre test held on November 27th was not the best that could be hoped for, and consequently one of the long distant going parties did not reach their destination.

VK5GY and 5RJ were at The Hummocks, and both contacted 5HD who was on top of Mt. Lofty; R7 each way.

A novel contact was VK5LX on his yacht sailing down the Port River and at Outer Harbour. Great activity was astir in the metropolitan area, and all worked 5HD, whose signal was enormous. VK5BF, the unlucky one finished up at Black Hill, a few miles from Mt. Lofty, but

nearer the Hummocks. If Frank had gone where anticipated, no doubt a new record for VK5 would have been established, well over 100 miles, but, alas, such was not the case. Another try will be made at an opportune date.

On December 21st a social Xmas Reunion was held at the club rooms, where a large attendance joined in the Xmas spirit and retold yarns of how they worked or lost that elusive DX contact. Supper was supplied by the committee in charge with refreshments. All members expressed their thanks to our worthy president, Mr. Kilgariff, 5JT, for donating the five-gallon keg of ale. I say ale; perhaps it sounds better, but you may use your own imagination.

## BARKER ZONE.

(By VK5GW.)

Conditions have been very patchy on 40 and 20 in the South-East. At Naracoorte 40 has been fair, but no contacts have been made on 20. A few sigs. from VU, PK and KA have been coming through, but the station cannot be raised from this location.

Very little has been heard of the Mt. Gambier gang; in fact, 5CJ is only heard here on rare occasions.

5XR keeping up with fb fone on 40 and 80. Cam is building for 20 now.

5PB expects to be on early in the New Year with a complete new rig.

5GW.—Very busy; not been on the air much. Tried fone and got R3 from 5XR, which is about half a mile away. Still putting up and pulling down antennas.

Conditions for 40 metre fone are going off here.

The Murray Bridge gang are heard at R5 now instead of the usual R8-9.

Wishing you all a Merry Xmas and a Happy New Year.

73. George.

## WAKEFIELD ZONE.

(By VK5RE.)

The draught from the doorway of life that was opened to admit the New Year has blown away the last page from the calendar of 1938, and 1939 now stands before us.

A new year filled with the promise of to-morrow—may it hold all the dream ships of every amateur, and here's a wish very sincere that they sail into the shack of each and every one of you—laden with their cargoes of good fortune and good DX.

VK5LR.—Jack has been busy with a portable rig in anticipation of a well-earned holiday. Good luck, Jack, and I believe the portable is very fb.

VK5GS.—New country member of the W.I.A., Peter is getting out well with a nice xtal note.

VK5BF.—Still pounds in with a very fb sig. Congrats. on your splendid 5 mx. field day effort, Frank, O.B.

VK5LC.—Also heard putting out very nice fone.

VK5RE.—Has his 20 and 10 metre rig in rack and panel mounting.

Ron Green and Nancy "going bush" for a well earned holiday. Good luck to you both; think I will stow away and come, too.

Allen Cunningham studying hard. Good work, Allen, old boy.

Harold Fisher still pleased with new car.

Merv. Tucker also busy with studies.

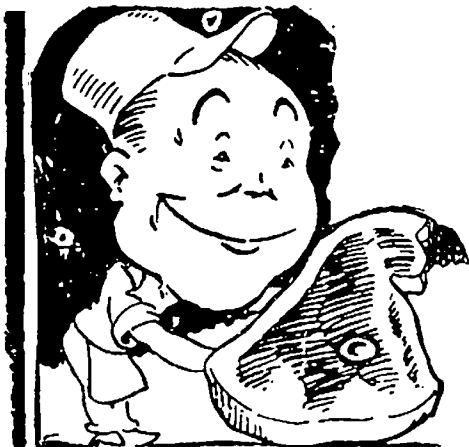
Well, guess this is the lot, so cheerio!

Hobby.

## GREY ZONE.

(By VK5LC.)

Due to the poor conditions and the apparent lack of activity, and



**THE CHOICEST CUTS!!**

also because no one has written to me since holding this office, I cannot make complete notes of the members in this Zone.

5RJ.—Congrats., Darce, O.M., on your 5 mx. success. Very good, seeing that you rushed the building of the xmitter and receiver.

5TL.—Hear you occasionally on an early morning sked. with 5JT, Tom, but other times do not hear you.

5MP.—Len very active on 5 mx field day from 10 a.m. to 4 p.m., but can only report hearing, other than myself, very weak carriers who he could copy on C.W.

5YM.—On 40 mx. C.W. occasionally. The night before 5 mx field day built 56 super-regen., and was hearing 5MP in morning with few feet of inside ant. at R7.

Haven't heard the following stations for a month—5HR, 5WG, 5LG, 5WJ, 5KJ, 5NW and 5BK. Please report, chaps.

5LC.—Been busy with wheat, but active on 5 mx. field day, on top Mt. Herbert. QSO 5MP R8 both ways. Had to use 5YM's super-regen. as mine would oscx. on 5 mx. QSO'd W8 on European Vee-beam, getting R8. Work it out, chaps.

Cheerio. Les.

## Western Australian Division

(By VK6WZ)

The postponed November meeting held too late to be reported in last month's notes had as its highlight a

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## Maxwell Howden

(VKSBQ)

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Vic.

lecture by Mr. Hayman, of Technical College, on thermo-plastics and synthetic resins. He spoke of bakelite and more recent developments along the line of mouldings and insulating materials. He also demonstrated a 913 oscilloscope as a wind-up to the lecture.

Conditions during November-December have been bad to fair. 14 mc. still holds the interest of the DX hounds, but is often noisy. 28 mc. showed up with a burst of fairly good conditions during the first nine days or so in December, when European Dx came through in the evenings between about 1100 and 1300 GMT. At these times European signals on fone (mostly) and c.w. (a little) were numerous, although not very strong. Contacts could be made with about the same reports at the other end. SU1MW in Cairo put an R7-8 sig. through during this period, and skeds were fixed with 6WZ. At the time of writing though a period of bad condx. is prevailing and the band is dead. Skeds are also kept (condx. permitting) with PAOFB.

6GB surprised us all by doing in a huge bank-roll on some fb new gear—T40 final, h.v. power supply, varimatch mod. tranny, 866 rectifiers, 6L6G modulators and what-have-you. Jack has been on 7 mc. a little taming the new gear.

6HT, rumour has it, now has an 809 in the final, and is working the world down on 14 mc. Skip prevents us hearing him up in Perth. What's doing, Harry?

6MW is heard on 14 and 28 mc. swishing his beam round and proving its effectiveness. It certainly works.

6FL heard (fone) working 6SA (c.w.) on a recent Sunday. Don't know what things are coming to! 6SA also heard working PAOFB in the same way (fone vs. c.w.) on 28 mc. Tut, tut!

6KW puts on test programmes on Sundays with some fb transmissions.

6DF said to be on ten metres, but hasn't been heard at this QRA. How's married life, Maurie?

6ZX (ex 4LX from Brisbane) has settled in our midst, and admits being pleasantly surprised at the variety and keen prices of ham gear available in VK6. Using 6V6G, 6C6G and HY61 on 14 and 28 mc. bands on fone and c.w. Has umpteen crystals on high and low freq. ends of the bands, so should be heard somewhere or another. Has plans for a rotary beam. Greetings, Elton!

Is my face red? Last month I mentioned "6GX" as one of the new licensees on the air here. Have since discovered that the gentleman using that call is a pirate! Has a cobbler called "6BK," who is likewise a "phoney" call. We live and learn!

Flash! 6CP, after six years, has gone crystal!! Smelling salts, please. Congrats, Clarie—fb signal you have now.

56 mc. men should note that 6BB is putting on a special transmission on 56.744 mc. between 1300 and 1430 GMT each Wednesday and Thursday. No dope available re type of antenna to be used or power, but the transmission will be crystal controlled and music and speech will be used. Reports wanted.

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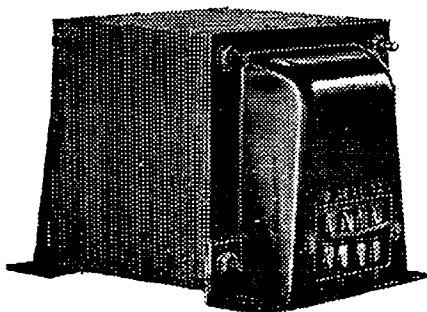
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# Amateur Radio

Harmonic QRM on 28 mc. is not confined to commercials. In VK6 many 7 and 14 mc. transmissions have hefty 28 mc. radiations, which cause no end of bother to those working this band. Harmonic suppression isn't difficult, but it IS good operating, and it does show a little consideration for the other fellow. A little less use of single wire feeders tapped on to tank circuits through blocking condensers would show an improvement. Perhaps the subject could be covered in an "A.R." article in the near future?

VK4 and VK7 Notes received too late for Publication.

## Hamads

Advertising space in these columns is available to those wishing to sell, buy or exchange, at 3d. per line; approximately five words to the line. Minimum charge, 1/-. To ensure insertion enclose postal note or stamps with copy, and address to the Advertising Manager, "Amateur Radio," White Horse Road, Box Hill, E.11., Victoria.

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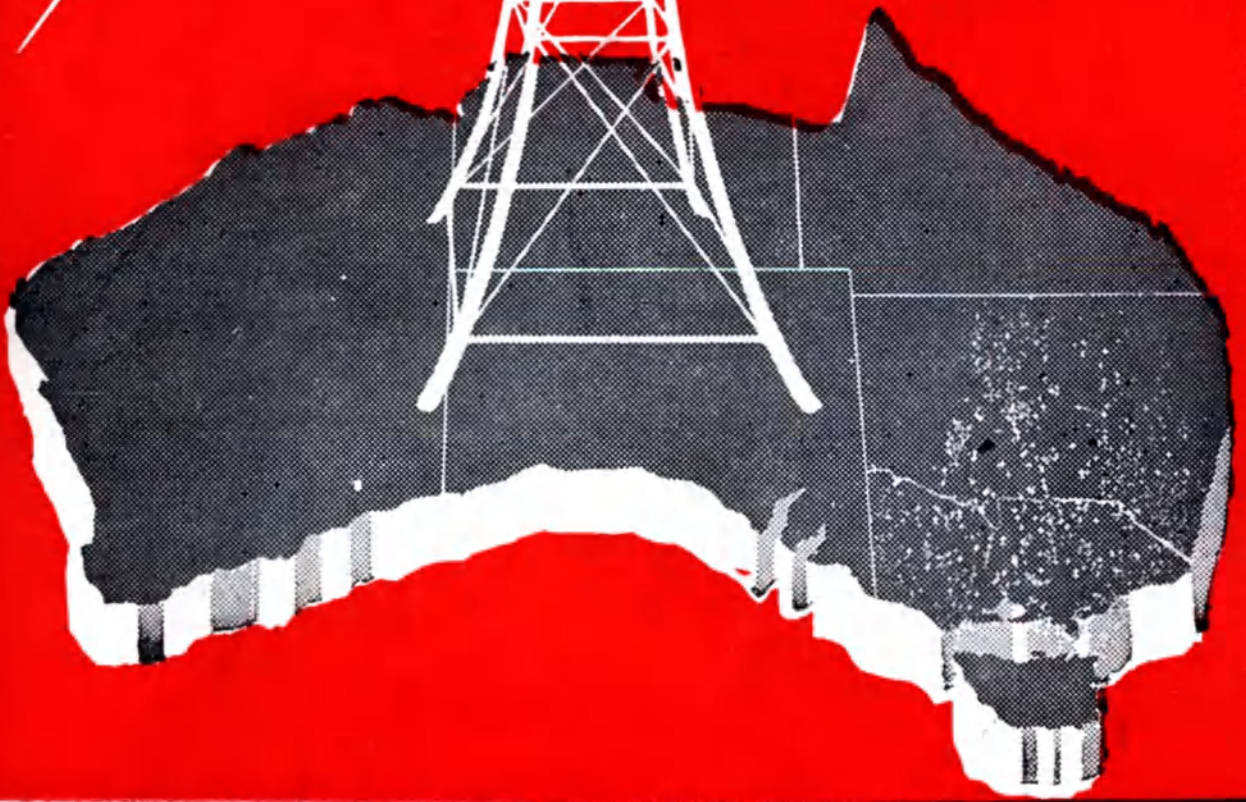
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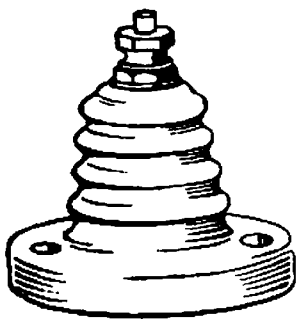
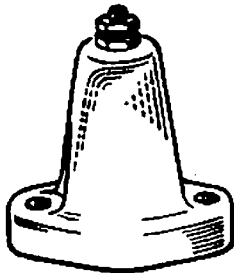


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FEBRUARY, 1939

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1st FEBRUARY, 1939

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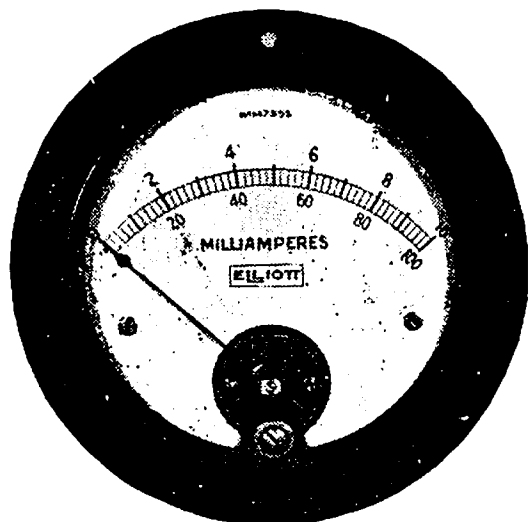
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# IT DID HAPPEN!

---

How many times it has been said of a national disaster overseas with lines of communication gone, "Oh, it can't happen here." It DID! After months of drought and days of high temperatures the worst bush fires in the history of the Commonwealth broke out. With temperatures throughout Victoria and South Australia, everywhere, between 110 and 120 degrees and fanned by a 40/60 m.p.h. gale, the position rapidly got out of hand. With half of Victoria ablaze, towns wiped out and the death roll mounting, communication to the stricken areas became a matter of paramount importance. A short time after the W.I.A. in Victoria and South Australia had offered the full resources of their organisations to the authorities, portable stations were on their way to the most vital points, some of them 250 miles away.

The rest of the story is one of efficiency and endurance, initiative and determination. Those portables had to work and they DID. Every station that went out was through to its control a short time after its arrival at its destination. Reading through some of the reports that are coming through (for as we go to press the work is still going on) one feels a glow of pride and satisfaction. "Fifteen minutes after arriving we had unpacked the gear and were pushing through the first message to the control station." "With lines of communication down for days we

gave them replies to their first reports in a short time." There are epic stories behind these bald statements of fact. Traffic handling is no easy job sitting quietly in one's shack with all "mod. cons.," but stuck in the midst of a devastated area, with nothing but a car battery for power, the handling of 400 group messages is a job that is worthy of unstinted praise.

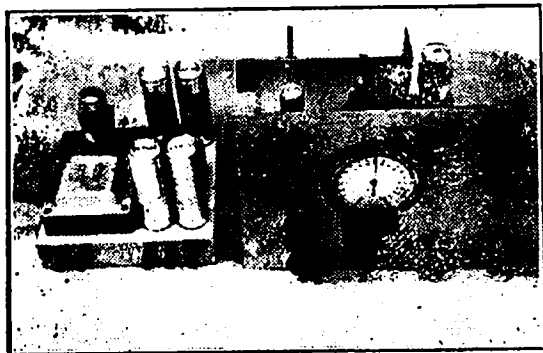
The full story is not yet told because the work is still going on, but a tribute must be paid to those who rendered such magnificent co-operation. To the Australian Aerial Medical Services for flying special equipment over to supplement that on hand, to the employers who gave leave of absence to the hams who took part, to the P.M.G.'s Department for their wholehearted co-operation, to the hams who helped to keep the channels clear of QRM and finally to those hundreds who in big ways and small did everything they could to assist those who formed the emergency nets.

To those of you who did the job; you have done something that the W.I.A. and your fellow hams in Australia will never forget. You have proved that a VK can rise to the occasion as admirably as the ZL's, W's and others have proved they can. You have lived up to the noblest traditions of our hobby. Great work! We are proud of you!

# Making the TRF Perform

(By VK3ML, Technical Editor.)

In spite of certain inherent failings, the T.R.F. receiver is still holding its own against the superhet. Probably cost is the main drawback to the super for some hams, and it is felt that so-called two and three tube supers are not worth while. Therefore, the old reliable devil we do know can show a point or two to those three cylinder supers if a little extra care is taken in—



- (1) The layout.
- (2) Construction.
- (3) Choice of components.

The receiver described here is the result of a made up job after some deliberation, and although it is an "all waver," going from 3 to 500 metres, it could easily be adapted to ham use by tapping the coils with the tuning condenser or utilising any of the more common band spreading devices. The tube line-up consists of a 6K7G as the R.F. amplifier, a 6K7G as regenerative detector, and a 6F6G as audio stage. The essential feature to be noted is the lay-out of components. In fig. 1 we note at the left back corner the RF grid coil, the base of which feeds the grid of the 6K7G RF tube directly. The 6K7G is lying on its side with the grid poking through the metal partition, and is barely noticeable under the RF tuning condenser in Fig. 2.

Along an easy flowing line the RF travels via the 6K7G stage to the detector coil on the centre left of fig. 2. The grid lead from this coil base to the grid of the 6K7G detector could be shorter than the length of the T.C.C. mica grid condenser if that were possible. A 6K7G detector tube was chosen because of its variable MU characteristics, and its great oscillating powers. This tube flies into oscillation on 3 metres with the greatest of ease.

Transformer coupling between the RF and detector stages is used to provide controlled selectivity (according to the coupling factor chosen) and adjustable gain (through the transformer primary impedance). A third winding for the regeneration is employed in preference to the tapped coil-cathode system (just an old fad.) This section of the receiver is the heart of the works, and with high quality components can provide really surprising results.



Choke impedance coupling to the 6F6G audio tube provides sufficient gain to drive that tube to its full output and to give good speaker volume. As the receiver uses a permanent speaker no output transformer is wired in the set; but for phones work it would be necessary to use an external transformer or choke output control.

# Amateur Radio

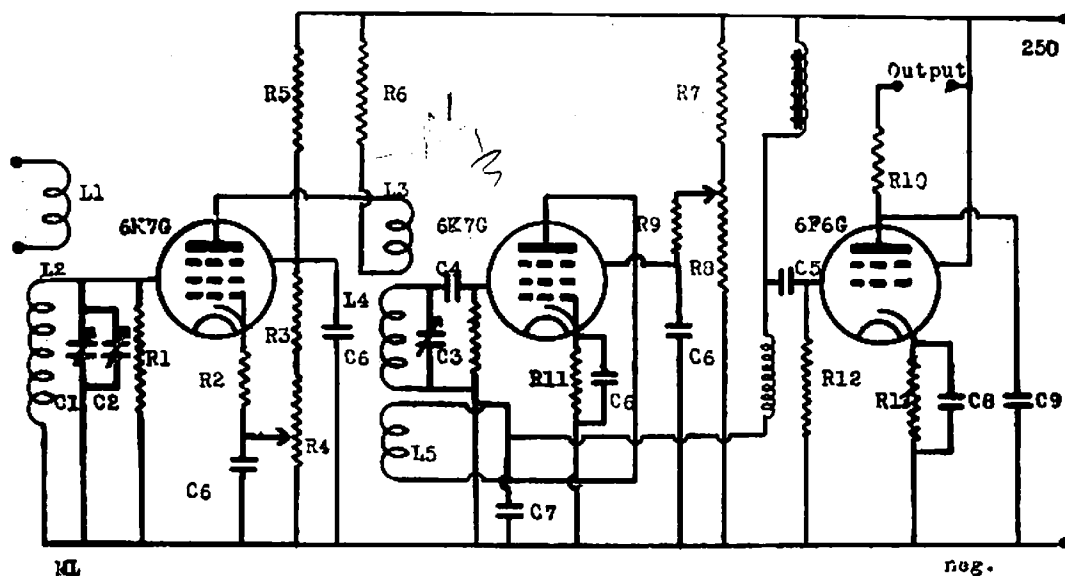
Ganging of the two condensers produced no serious problem over the whole tuning range because of the use of a small trimmer condenser across the RF grid coil, and brought out to the front via the flexible coupling of Eddystones (see fig. 3). When a signal is tuned in a slight adjustment of this condenser is all that is necessary to resonate the circuits thoroughly.

the receiver, but it gives satisfactory performance with as low as 180 volts.

Smooth tuning control at both low and high speeds is provided by the Eddystone slow motion dial, and at the 100:1 ratio, even without band-spread, signals on the highest frequency bands are easily tunable.

The chassis, panel and shields are all made out of aluminium. Dimensions from the chassis are 10in. by 10in. by 2½in. deep. The panel measures 11in. wide by 8½in. high. The requirements for the partitions are: One piece 10 by 5in., 6 by 4½in., and

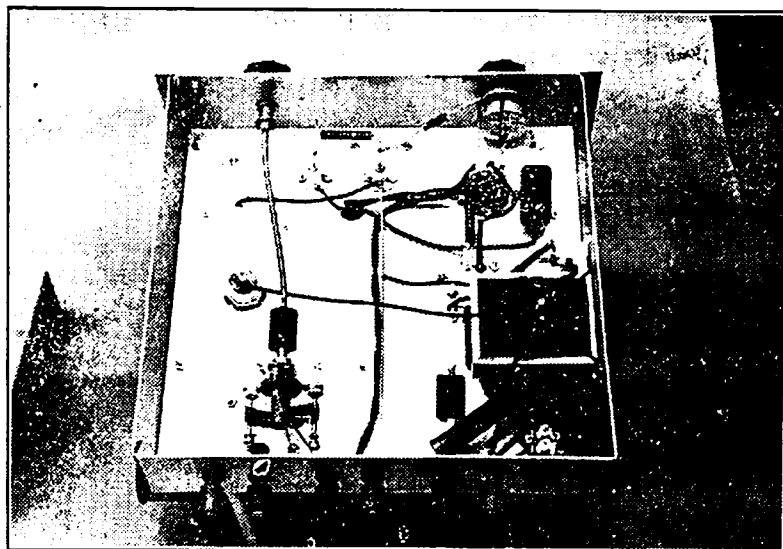
An external power supply is preferred in this receiver to avoid hum pick-up by the sensitive detector. An H.T. supply of 250 volts at 50 milliamps is all that is required by



- |                        |                          |
|------------------------|--------------------------|
| R1 2 megohms           | R12 0.1 megohm           |
| R2 250 ohms            | R13 450 ohms             |
| R3 15.000 ohms         | C1 15 m.mfd trimmer      |
| R4 10.000 ohms pot     | C2 100 m.mfd microdenser |
| R5 20.000 ohms         | C3 100 m.mfd microdenser |
| R6 10.000 ohms or RFC. | C4 100 m.mfd mica        |
| R7 25.000 ohms         | C5 0.1 mfd               |
| R8 50.000 ohms pot     | C6 0.01 mfd              |
| R9 0.1 megohm          | C7 100 m.mfd             |
| R10 100 ohms           | C8 25 mfd electrolytic   |
| R11 1000 ohms          | C9 .001 mfd              |

Coils.—All wound on Eddystone standard coil bases.

Coverage	Turns		Inductance	L3	Inductance		L5
	L1	L2			L4	L5	
9-14	3	2 $\frac{3}{8}$	0.50 uH	1 $\frac{1}{2}$	2 $\frac{3}{8}$	0.51 uH	3
14-26	2	3 $\frac{7}{8}$	1.08 uH	2	3 $\frac{7}{8}$	1.07 uH	3
22-47	4 $\frac{1}{8}$	8 $\frac{1}{4}$	3.62 uH	4 $\frac{1}{8}$	8 $\frac{1}{4}$	3.62 uH	4 $\frac{1}{8}$
41-94	9 $\frac{3}{8}$	23 $\frac{7}{8}$	14.24 uH	9 $\frac{3}{8}$	23 $\frac{7}{8}$	14.13 uH	9 $\frac{3}{8}$
76-170	15	35	45.0 uH	10	35	45.0 uH	14
150-325	25	92	0.188 mH	42	92	0.188 mH	35
260-510	40	138	0.420 mH	90	138	0.428 mH	40
490-1000	30	315	1.90 mH	200	315	1.53 mH	80
1000-2000	140	630	6.98 mH	300	630	7.05 mH	140



5 by 3 3-Sin. 16 or 18 gauge metal is recommended.

Much of the more usual descriptive matter in articles of this nature is considered unnecessary in this case because there is nothing new in the circuit, etc., and we do not like repeating old stories. Consequently the object of producing a receiver with a high efficient layout and design has been fulfilled in this

short article, aided by the more or less self explanatory photographs.

In conclusion, it is felt that this receiver possesses performance that one would expect of a really good TRF receiver and duplication of the lay-out can well be recommended. It is not always the components that count, but it is how they are used that gives the results.

---

## Bushfires Devastate Two States

### *Hams Provide Emergency Communications*

#### VICTORIA.

On Friday, 13th January, as the bush fire situation in Victoria became critical, the Victorian Division offered the full resources of its operators and equipment to the Forest Commission. On Saturday, 14th, the Commission advised that communications were urgently required to Tallangatta, 230 miles from Melbourne, Bright (188 miles), Wood's Point (200 miles), Noojee (110 miles), and Beech Forest (130 miles). Although many other places were isolated, stations at the above-mentioned points would provide centres to which information and reports could be sent. Omeo was also

devastated, but on Wednesday, 11th, 3WE had been handling P.M.G. and Forestry traffic with 3FL and 3NI in Melbourne. As this channel had been proving so effective over a period of days, subsequent organisation was made, leaving it intact. The main problem was to get sufficient operators who at a moment's notice could leave their homes and jobs for an indefinite period, but within a short time 3SG and 3ML were on their way to Bright, 3UM and 3RZ to Wood's Point, 3ZV and 3VG to Noojee, and 3UK to Beech Forest. Each station took full camping equipment and food for three to four days, and in every case except one the parties supplied their own transport.



## Amateur Radio

3EG of Tallangatta was able to provide the station required there, and 3ZC formed the Melbourne control station, with 3QK relieving him. In case further equipment was required, the Australian Aerial Medical Services kindly loaned all they had available in Melbourne, and arranged to fly two additional outfits over from Adelaide immediately.

The results were a real confirmation of the general efficiency and initiative of the Radio Amateur. Every station was through to Melbourne shortly after arriving at its destination. The frequencies chosen and the suitability of equipment for the work clearly illustrated the Ham's ability to cope with any emergency.

Reports are still coming through, but the following is a brief survey of what the emergency net has done so far:—

OMEQ.—3WE, a resident of Omeo, immediately placed his station at the disposal of the authorities after regular communication had broken down and handled well over 150 telegrams with 3FL and 3NI in Melbourne.

TALLANGATTA.—3EG, who lives there, was acquainted of the fact that the Forest Commission urgently needed a channel to their Forest Officer, and he immediately arranged schedules with the Melbourne control station, 3ZC, and handled all Tallangatta traffic from early Sunday morning.

MELBOURNE.—The control station was 3ZC, who did a grand job taking traffic from the various portables from Sunday morning until early Monday, when a severe power leak caused him to transfer the control to the relieving Melbourne station, 3QK. This latter station carried on throughout the day. 3ZC resumed in the evening. The same arrangement worked satisfactorily on Tuesday as well, 3QK taking over as soon as the power leak at 3ZC's occurred.

BEECH FOREST. — 3UK and Geoff Searle had as equipment a 76 Pierce Oscillator feeding a 6V6G powered by a vibrator pack, a TRF battery receiver and a 7 mc. doublet aerial. A call was made at Colac on the way through, where the Colac and Camperdown hams were at work organising an additional station, which it was arranged would follow on to Beech Forest when ready. 618 words of urgent traffic were handled up to midday Monday, when the relief station took over. Colac transmitter was built by 3GQ, 3KX, 3KJ and 3GC and the receiver was 3KJ's. It was operated by 3GQ until 3PE arrived from Melbourne to act as the main operator, and their organisation of reliefs was such that the station was to remain there as long as they was any further danger.

BRIGHT. — 3SG and 3ML took three transmitters, two receivers, batteries, a vibrator and an AC pack so that they could use whatever the occasion demanded. They operated from the Shire Hall in Bright, and handled over 180 words of traffic on 7 mc. The situation in the town was changed from a critical one 24 hours after their arrival by the downfall of over an inch of rain.

WOOD'S POINT.—3UM and 3RZ arrived at Wood's Point after a difficult trip to find the town wiped out. The value of their services can be imagined! They handled 697 words of urgent traffic on 7 mc., using a 6V6G E.C. oscillator powered from a genemotor, input 2.5 watts. They worked continuously through Monday and Tuesday, and after receiving a Forest Commission message to come home, after the P.M.G. line was restored, twice packed up, only to have to unpack again when the line went out again through falling trees.

NOOJEE.—3ZV and 3VQ were going on holidays with portable gear when they heard of the emergency, and as a result went to Noojee. On finding that the landline had been restored when they arrived they

went on and opened communication at different points where it was most needed. As no report from them has come to hand no details of their equipment or traffic is known.

3WG did a great job in organising the net, and as the work progressed was able to keep the wheels running smoothly. It is to his credit and to all who took part that not one hitch occurred. As one operator put it, "Working the control station was like dialling a telephone number." Thanks are due also to those many others who offered their services, to those who monitored the hands, and to those who made the work easier by keeping clear of the emergency channels.

## SOUTH AUSTRALIA

For the first time in the history of Amateur Radio in South Australia a chance came for the Amateurs to do their stuff and show that not all they did was to call CQ and work DX. Adelaide was experiencing a record week of heat waves and terrific bush fires had been raging for days, but on Friday, 13th January, the situation grew worse and B.C. stations were calling for more volunteers. Hearing that all communications were down, VK5KL got busy to try and get together some gear to proceed to the stricken areas. VK5JT was detailed to inquire from local R.I. if it was o.k. to go ahead. This permission came through as Frank Holsten, 5LX, arrived with his gear at a city address where 5KL was sending all inquiries.

As they passed on their way 5JT was again rung and told to keep an eye for them on 40 metres. Proceeding to Echunga, where all lines were down, the rig was set up near the post office, but before it could be got going properly, had to be shifted as the fire swept into the township and within a few yards of the gear. Setting up again further away contact was established after the first calls had been intercepted by the A.I.M. station at Broken Hill and wired to Adelaide.

All urgent appeals for men, water, goods and first-aid equipment were being handled to Joe Kilgariff, 5JT, who was in direct communication with the National Safety Council, who were controlling all volunteers and directing all operations. So many requests were made that permission was obtained to handle telegrams. As night fell skip took control and so traffic was handled through VK2AHM, who with 3CG, 3KY and 3TK were from early Friday afternoon keeping the emergency channels clear standing by in case they were needed.

VK2AHM handled the traffic back to 5JT until early morning, and here an ironic incident comes in. VK2AHM was handling a message from 5LX for an appeal for relief operators and a new set of batteries for the 32 volt rotary converter, while all the time his own were almost flat and then had to cut out while he recharged them. Such is the ham spirit to keep going while possible. 1.30 a.m. Frank Wreford, 5DW, arrived with the new batteries and so 5LX and 5KL snatched an hour's rest, then returned to the job. After VK2AHM retired VK2CI took over and he took the traffic through the early hours of the morning until the dawn contact was again possible direct to 5JT.

At 6 a.m. telephone communication was established to Echunga and so 5LX was immediately detailed to the Meadows, six miles further on, where no word had been heard direct for two days. Arriving there the constable was dug up and all traffic authorised by him. Here the operators were besieged with telegrams and continued on until 1 p.m. Saturday. Everything being o.k. a snift was made to Prospect Hill, where the fires were reported to be bad. After traversing extra rough roads and finding all well, the rig was again erected, but trouble occurred. This was found to be a coupling condenser between stages. Two pieces of flex twisted together substituted in its place. Grub screws had been lost from condensers in the receiver so had to be set on 5JT's frequency. From Prospect Hill the next step was through Yanhalila and

to Blackwood and Belair, but all was well through these areas. The one blaze that was still going was investigated, but now at 7 p.m. clouds appeared in the sky and with spots of rain the operators reluctantly packed up and headed for home—nothing more could be done.

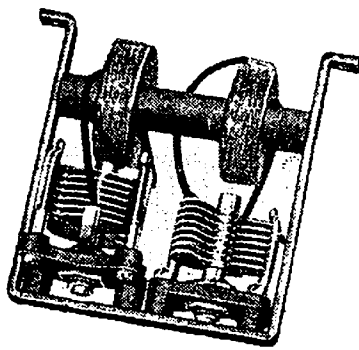
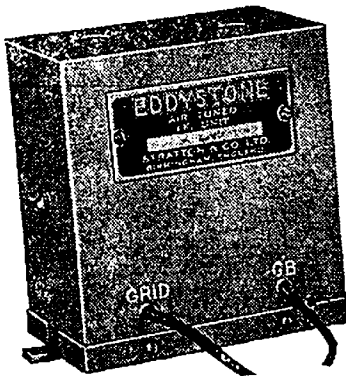
All Saturday VK3 stations could be heard handling emergency traffic in their own State and all knew they were doing their share. While 5LX was handling the bulk of the work, good work was done by 5HD, 5GB, 5GN, with 5GF's gear, and Mr. Don. Rieman. Proceeding to Aldgate they were intercepting messages from 5LX and what men and supplies could be despatched were done so from there to save time for men coming from the city. All Saturday until midnight this gear with 5GB and 5RT and 5ZU keeping half hourly schedules stood by with men of the Adelaide electric supply ready to be called upon at a minute's notice. Fortunately rain arrived and so all fires were subdued.

Mostly used was cw, as signals were weak and hard to copy in Adelaide. Here excellent work was done by Mr. Castle, VK5KL, who operated from 12 p.m. Friday until 7 p.m. Saturday with only one hour's sleep. No special praise can be given to one as all were on for the same time and did their particular job without fuss. To the following we give our congratulations in putting amateur radio on the map:—VK5's LX, JT, KL, DW, ZU, GB, HD, VK2AHM, 2CI, VK3TK, 3CG, and all those who so kindly kept our frequencies open. To firms who lent batteries, etc., also gear, our special thanks.

The gear used by 5LX was as follows:—Rig. 42 ocs. 6L6 pa, 6N7 modulator receiver, 9 tube super; power was supplied from a 32 volt rotary converter giving 270 volts into transformers. Antenna was 66 ft. link coupled to final amplifier.

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# Switching

A Few Notes on Policy, with a Simple Method of Station Switching

(By D. Randall Ayre, VK3KP.)

Have you ever stopped to think just why that pal of yours took nearly seven seconds to get on the air after you said "over"? Or why he missed the first few words you had to say? Maybe you're one of the lucky ones who can prattle about "pulling the big switch" without feeling self-conscious. If the switch really is big and if you have to pull only one of them, then, my friend don't bother to read any further. But if last New Year's resolution to install press-to-talk has somehow slipped a bit, then perhaps you may find something of interest in what I'm going to say.

Both for the sake of brevity and clarity, we'll consider the question in summarised form.

## (a) WHO?

The answer to that one is everybody, from the newcomer to the grey beard (and especially including those few band-hogging old timers who really believe that the divine right of Kings is applicable to Ham Radio). There are three reasons for including one and all:

1. Delay in changing over is a bad policy.
2. It doesn't cost much to fix it.
3. If you're not careful, successive stage switching can make some mighty queer noises on the air before you get going.

## (b) WHY?

Something tells me that the nasty men are going to pick on this item. There are just a few of them in the Amateur Ranks and a very strange creed they have. It runs something like this: "What the heck do I care what I sound like on the air? I work the dx, don't I? Why waste good money on what half the lads haven't got, anyhow? I'll wait until I have to!"

Alright, nasty man. Forget all about courtesy. In between the times when you're tumbling on to the band and falling off it, why not make a job of it? Put a big fat smear right in the middle of the band and give the boys a real treat. Besides, the other fellow just loves the row you make while he's waiting for you to talk. It goes like this you know; more so, if you're close by: 2 to 5 seconds silence-click-hum-crack-more

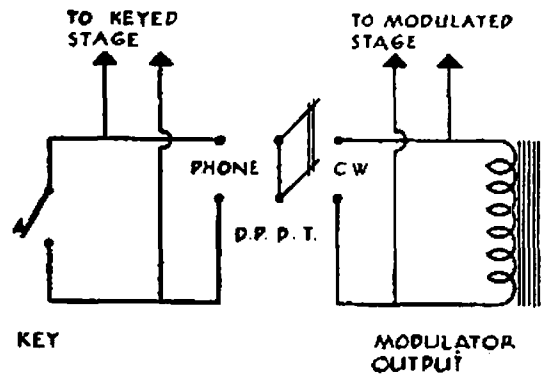


FIG. 1.

hum - bang - terrific hum - yoops, whistles, feedback-comparative silence-speech (good, bad or indifferent). And don't say its impossible. I've heard it.

As I said before, alright; forget courtesy, forget altogether the ideal of a clean, swift transmission technique just for its own sake. The sensible fellows know all about this without having it explained to them. But, nasty man, apparently you don't. Hence this next bit is just for you. It tells you how to gain something. Maybe that will interest you.

When you're working up-to-the-minute stations on the other side, and for that matter, right on your own doorstep, you're dealing with men who have a kind of love for efficiency. They often find it rather hard to understand the man who lacks that love. And you are by no

means the only pebble on the beach. You're going to lose quite a number of contacts if you waste too much time on the changeovers. If a signal doesn't appear when it should, and the QRM dogs are howling, 5 seconds makes a surprising difference. Maybe you think that's carrying things a bit too far? Don't you believe it! It's been tried both ways and the answer is still the same.

Then there is a decided saving in time, time all too valuable in contests. Just get into the habit of 10 to 30 second overs, and you'll be amazed at the number of extra, enjoyable QSO's you can fit in. Chiefly because you don't ramble on and repeat yourself in a half-hearted effort to avoid going over too quickly. It's easy the right way. But just imagine travelling down a row of switches to say twenty-five words.

### (c) WHAT AND WHERE?

We'll consider a typical phone/cw station with all necessary equipment. You can easily break it down to suit your own rig. The component units are:—

1. Transmitter with power supplies.
2. Modulator with power supply.
3. Pre-amplifier with power supply.
4. Receiver with power supply.
5. Monitor with power supply.
6. Antenna or Antennas.
7. Keying Circuit.

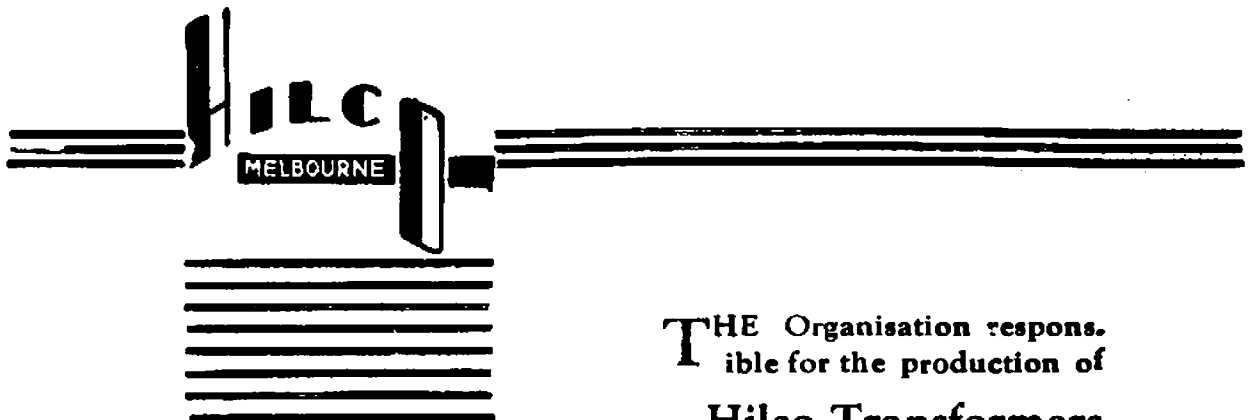
Station switching is divisible into two sections:—(i) Start up switching; (ii) Changeover switching.

Although (ii) is one that matters most, its quite an idea to clean up (i) while you're at it. Taking each unit in turn, we'll set out the best method of switching it under these two heads and then combine all the units to form the whole station.

### 1.—Transmitter with Power Supplies.

(i) Start up switching: One S.P.S.T. Mains Switch—Rectifier heaters, Transmitter heaters, Plate transformers, Bias supplies.

(ii) Changeover switching: One S.P.S.T. switch—Centre-taps of all low voltage plate transformers to Earth.



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One S.P.S.T. switch—Centre tap of high voltage plate transformer to Earth. (If there is more than one high voltage transformer, have more than one switch.)

All changeover switches are ganged.

**NOTES:** The plate transformers can come on with the heaters since the change switching should normally leave the centre-taps open when the station is closed down.

When more than one transformer centre tap is connected to one switch, the insulation of the smallest transformer must be sufficient to cope with the voltage developed across the open switch by the biggest power supply connected to it.

If you think your low voltage transformers can stand it, by all means connect the higher voltage centre-taps across the same switch. It will help in reducing the number of contacts on the multiple changeover switch which is used to combine all the units. It will be seen that the above system of simultaneous centre-tap switching brings on all the stages at once. As long as your oscillator is not given to missing out on you, this is quite satisfactory. If things like that worry you, put some fixed or cathode bias here and there to hold the big tubes down when the drive fails.

Advantages of centre-tap switching here are saving of mains power, increased rectifier life, less high voltage playing round the switches than in B plus switching. Naturally, one still has B plus switches for neutralising adjustments, etc.

## 2.—Modulator with Power Supply.

(i) Start up switching: One S.P.S.T. mains switch—Rectifier heaters, modulator heaters, plate transformer, Bias supply.

(ii) Changeover switching: One S.P.S.T. switch—Centre-tap of plate transformer to Earth.

Advantages are as for Transmitter.

## 3.—Pre-Amplifier with Power Supply.

As for modulator, and connected to the same switches.

## 4.—Receiver with Power Supply.

(i) Start up switching: One S.P.S.T. mains switch—Heaters, plate transformer.

(ii) Changeover switching: One S.P.S.T. switch—Centre-tap of plate transformer to Earth.

The advantages of switching the centre-tap of the receiver are the same as for the transmitter with this notable addition, that it is much quieter than switching B plus.

## 5.—Monitor with Power Supply.

It must be admitted that it doesn't greatly matter how you switch this. Have it on all the time unless you really want to cut the power bill to pieces. We'll forget it from now on.

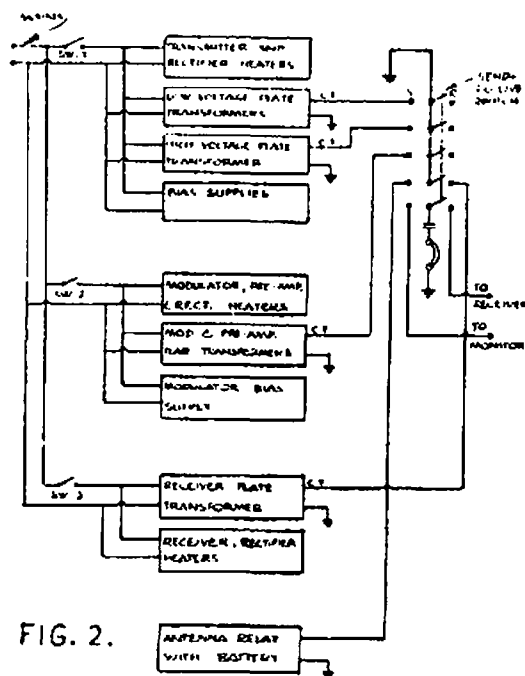


FIG. 2.

## 6.—Antenna or Antennas.

If there is only one antenna, it should be controlled by a D.P.D.T. relay controlled by a S.P.S.T. switch arranged so that the relay battery is on when the antenna is connected to the transmitter. This will save the battery, since you'll be doing a lot more receiving than transmitting.

If you're lucky enough to have two or more antennas, just leave 'em connected!

## 7.—Keying Circuit.

This subject really has but little relation to the matter of station switching, and in any case the actual method of keying adopted is largely a matter of circumstance or taste. Figure 1 shows a circuit for a phone/cw switch which is applicable to practically any rig.

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## Amateur Radio

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(d) HOW?

All the above changeover switches can be combined in one simple home made switch. Before discussing that, however, we'll deal with the matter of the start up switching.

All the main switching is controlled by three switches as follows: Switch No. 1, Unit 1 only; Switch No. 2, Units 2 and 3; Switch No. 3, Unit 4 only. Switches 1 and 3 prepare the station for CW, and the addition of Switch 2 prepares for phone. See Figure 2.

The changeover switching is arranged so that all the necessary switches are operated by the one lever; there is one point which makes for greater convenience of operation and that is to have an intermediate position where neither transmitter nor receiver are on. The switch should be left at this position at all times when the station is closed down, and this will ensure that, when the station is first switched on, the plate power will not be applied to

any mercury vapour rectifiers before their filaments have been allowed to warm up properly.

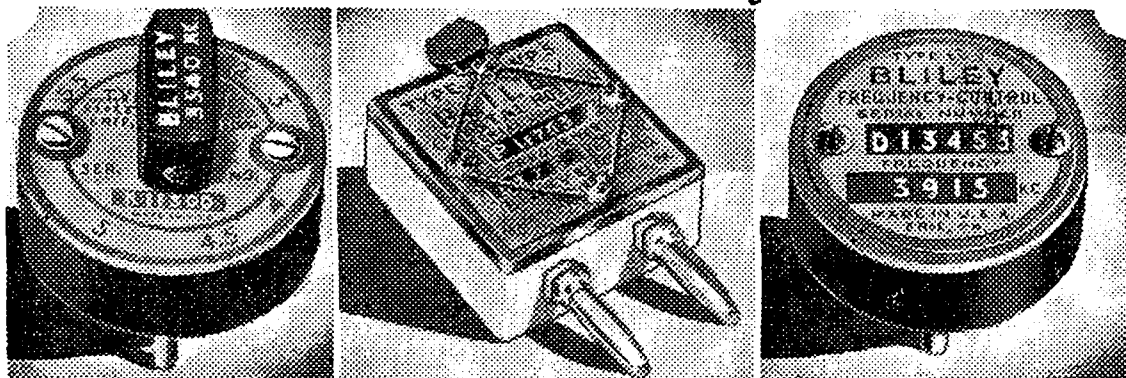
Figure 2 shows the wiring of the changeover circuits.

It should not be necessary to suggest ways of making the multi-pole two-way switch. A little ingenuity, coupled with a sober regard for the nature of the voltages which each section of the switch has to carry, will soon produce a suitable device. Incidentally, if your particular installation can be reduced to a four-pole double-throw switch, try one of the old-fashioned, ebonite-insulated anti-capacity switches. They were designed on spacious and liberal lines, and some of them will work quite happily at the centre-tap of a 2,000-c-2,000 transformer.

Spare contacts can be used to switch the phones from the receiver to the monitor. If you like to turn the changeover switch into a relay, you can install a push button and have real push-to-talk.

It may remove the qualms of the doubtful if I tell them that everything suggested above has not only been tried, but works well.

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## 28 and 56 M.C. Notes

(A. Pritchard, VK3CP.)

Conditions on ten meters show exceptionally strong signals from the States and the western side of Canada. During the afternoons a few stations from Asia and during the evening phones from Europe keep the band interesting. The most outstanding development seems to be the universal adoption of the three element beams, i.e., director, dipole and reflector. This beam seems very superior compared with the 8JK and very few are using this or other types now on 10. The gain is really remarkable, theoretically only 5.8 db over a half wave doublet, yet experience has shown an actual signal strength gain of at least 4 r points, giving 20 db gain and a signal that rides well above fading and background noise. It is equally effective if used for receiving also.

This beam has been in operation here at 3CP for a considerable time now and results are truly amazing. The centre of the dipole being only 8 ohms, makes the delta or Y matching feeder the most suitable. The matching section dimensions are not as critical as may be thought and 54 inches on each leg of the Y for feeders around 600 ohms, works out nicely. The actual measurements here are as follow:—Dipole, 16.8 feet; reflector, 17.3 feet; director, 16 feet; 5 feet director di-pole spacing and 3.36 di-pole reflector spacing. These measurements are for a frequency around 28400 kc.

VK3HK has fixed one of these rotaries on the top of his pole and listening here while he turned it, showed the signal completely out of audibility when back on. W7BQX uses two tubes in his rig for the RF section, 6L6 co and 807 doub with 30 watts input and modulated by a pair of 46's class B. The antenna gives us r9. He has three rhombics having 5 waves in each leg placed around his five acre hill which is just south of the city of Victoria, B.C. The feeders are made with 7/20 galvanised wire, 20 inch

spacing, 250 feet long and having an impedance of the necessary 800 ohms for direct feeding. Feeders are brought from each end of the diamonds so that they may be fed and resistor terminated either end, giving the beam in either direction as desired. 7BQX was r9 with correct feed and termination, r7 without the resistor and r2 when terminated and fed from the wrong end for us.

During the week of records for 100 to 114 degrees the W9 signals seemed to be the loudest from the States and on Sunday, 8th January W9DSR was r5 during a qso at mid-day. He was using 2 tubes, 30 as eco and single 19 final with five watts input, modulated by a pair of 49's. His 5 watt signals were 5 and seemed as consistent as the 700 watt phone from W9ROQ. Both use the 3 element beam and if 5 watts can do a job like that it shows its efficiency. The temperature here was 105 and 7 deg. above zero at W9DSR!

From VK4, 4VJ has excellent signals here, and although the W's contact many VK's, they are inaudible in VK3. VK2HF evidently has powerful signals by the number of W's calling him. It is quite a pleasure to listen on 5 meters with so many excellent xtal carriers. VK3OI from Brighton has r4 phone, and VK3DA r7, 3PS r9, 3JO rmax, 3YL r8, 5NB r8. These excellent phones show that hills between stations do not have the effect that was originally thought responsible for peculiar conditions on 5 and the idea that signals must be in optical range, now points to the fact that a concentrated carrier (crystal controlled) is of primary importance for any distance. VK3CZ gets efficiency plus with his new rig and the 800's in the final modulated by 809's class B, gives a fine signal. There are many VE5's on 10 and VE5AEZ, 5AA, 5OT, 5VP, 5GL, all have excellent phone. The cw portion of the band is alive around 7.30 a.m. and will give the cw men some dx.

## VK3MR's DX Notes

Our deepest sympathy is extended to the sufferers in the recent tragic bush fires which swept over the country districts of Victoria. In spite of the terrible loss of life and the enormous destruction of property, much valuable data has been gleaned for any future use, especially as regards communication purposes when all the lines are down, as was the case this time, and it gave the amateurs the chance to prove their value in a case of emergency. Great work was done by 3WE and 3EG and others. Fuller particulars will be found somewhere else in this mag. By the way, ask Bill of 3WE if he likes milk in his tea!

Bad conditions are reported in all southern States this month, and little activity was the result. It seems that the States further north, to wit. VK2/4 get the best end of the stick especially with S. American stations and S. Africans. VK7IZ has been doing a bit of dx when conditions are ok, and has worked VQ2MI, N. Rhodesia, and ST6KR, both are really rare for VK7. They were contacted around 1 a.m. on the HF end of 14 mc, and are consistent. Don't overlook VU7BR as he is a new country, qra J. Brown, Bapco, Bahrein Is., in the Persian Gulf. While on this very important subject of new countries, have a go at the chaps signing KC6, KF6 and KG6. These are the new prefixes for the U.S.A. Is. in the Pacific Ocean. KC6CKM, 14300 kc. is from Wake Is., and is on most nights. The complete listing of the Is. in the Pacific and other American possessions are as follows: KB4, Virgin Is.; KB6, Guam; KC6, Wake Group; KD6, Midway Is.; KE6 Johnson Is.; KF6, Baker, Howland and American Phoenix Is.; KG6, Jarvis and Palmyra group; KH6, American Samoa; K7, Ter of Alaska (including Pribilof Is.); KF6GHW will work as many as he can while there, and can be heard on solid fone most afternoons.

The South African DX Test is in full swing now, and 4EL seems to be giving it much of his attention, and he, as well as the other VK4's, seem to be able to work them when the more southern States can't. Those chaps still looking for South America are advised to keep their ears on 14 mc. from about 1800 to 2000, when LU3HK, 14275 kc.; LU5BL, 14480 kc.; PY5QG, 14370 kc., and CX1BG, 14408 kc., can be worked if they can beat the VK2's to it; Old CR9AA is still on the job with his scratch note in the W fone band and can be worked from 2a.m. onwards. 2DG has just received yet another certificate for winning the SP contest. Seems a habit with him.

The fone gang seem very quiet this month also. 3BM will be breaking out into CW now that he has got the dope on how to make his B.F.O. osc! It seems that English is becoming the universal language, judging by the number of European and Asiatic Hams heard lately. J2CS, J2KQ and 2MI speak excellent English, and are on the job most early evenings. Many Portuguese fones are reported by 3BM, the most outstanding being CT1OX, who can be worked about 5 a.m. by those who can wake up that time. It seems that W4DLH is having some trouble to repeat the fone WAC hook-up this year. 4VD reports working all the VP from 1 to 9. That's good work, Vince. Looks ok for the BERU contest coming off during the four weekends of February. I would very much like to have the scores from the gang participating in this test for publication in the mag. What about it? Flash from Tasmania. VK7CD has taken unto himself a wife. Fine work, Ced. VK7JB has been transferred to VK2, so we may even hear him with a VK2 call yet. New prefix for Belgian Congo is OQ. OQ5ZZ can be heard around 5 a.m. on 14350 kc. using fone.

## Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 15th of the month preceding publication.

### N.S.W. Division

#### ZONE 5 NOTES.

(By VK2IG.)

It is with great pleasure and pride that we find that the hams of Australia have been of service throughout the dreadful bush fires which we have experienced. Communications were established with the cities and other points by amateurs from Omeo, Bright, Tallangatta, Upper Murray and also in the Gippsland areas by means of their own portable outfits, and by using pedal wireless sets which were made available. Apart from their valuable experimental work, surely this is one phase which more than justifies their existence.

Conditions seem fair to bad on most bands, with static very bad, and also in Albury electric motor grm has been shocking.

VK2OJ.—Still very busy, and doesn't expect to be on for a while yet. Is talking of holidays soon.

VK2AP and Jess from 2YW have joined forces. Guess the xmitter will always be on now. Congrats. from all the boys to you both, Jess and Arthur.

VK2AFD.—Home for a few days, but back to Laverton.

VK2VK.—Also was home, but now back on his boat. Home in three weeks.

VK2IG.—Now back from hospital and doing a little, but rig playing up. Cards to hand from CP1AA, HB9CE and YR5TP.

2AEO, of Wagga.—Still among the DX, but may be shifted any time.

U.S.A. now using the new intermediate prefixes for the Islands,

such as Guam and Wake, etc., consisting of a letter between the K and 6, such as KC6MB, etc.

DX heard here include VP7, LA, ES, EI, EJ, VP5, VQ2, XZ, KC6, KF6, HC. Who is EJ as we've heard a couple of them?

#### COALFIELDS NOTES.

(By VK2KZ.)

VK2KE.—Doing very little in radio over the holidays, but expecting to be more active in the future. Get on 40 metres on Sundays, Bill; the boys are generally on then rag chewing.

VK2VO.—Also away holidaying in the Ford 10 at Swansea. Playing around with PA systems, on 20 at times; maybe on 80 for coming winter. When are you going to officially open the shack, George?

VK2XT.—Cannot settle down yet, so doing nil in radio. Has invested in a nice car, spent good holiday at Belmont. Let's hear you as soon as you can find a shack.

VK2DG. — Doing considerable amount of service work for BCL sets; on 20 fairly regular, away during holidays at Singleton.

VK2KZ.—On 20 very little, as conditions are very bad in this area, holidaying at Swansea during Xmas. Still thinking of going on phone, or maybe up to 80, for coming winter.

VK2PZ.—Doing all phone work on 20; working some DX, ZS, KA, J W, etc., contemplating new antenna. Interesting himself in Class B modulators. Spent fair holidays during Xmas.

VK2CW.—Sorry to hear you are on the sick list, Bill. Radio activities zero. Good recovery, O.M.

VK2ACG.—Heard of 20 metres using CW. Not too active. In Syd-

ney for holidays. Let's hear more of your.

VK2JE.—Apparently spends all his time at Port Stevens. On 20 metres now and again. Let's hear from you, Jack O.M.

VK2KQ.—Using 20 metres, using phone and key. Thinking of putting up a new antenna.

VK2YL.—Doing a little on 20. WAC on phone every couple of nights, conditions ideal. DX tally now 116 countries. Uses four separate antennas, and sure collects the DX.

I wish to thank all for assistance rendered during 1938, but hoping for more co-operation in 1939. It's up to you, boys.

73. Max.

## Victorian Division

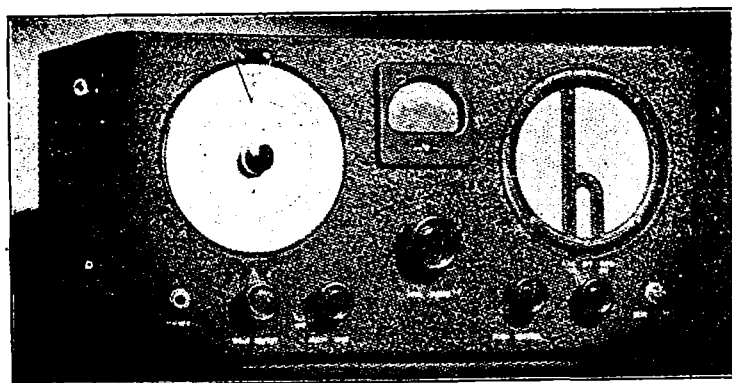
### KEY SECTION NOTES.

(By 3OC.)

Although this is not the book re-

view department, your correspondent cannot refrain from recommending "For Murder Will Speak," by J. J. Connington. Amateur radio plays the main part in the plot of this "oodunnit," which is well written and interesting. The writer, although perhaps not a ham, has been well advised as to technical details, and the book is free from the usual howlers encountered whenever radio is brought into fiction. If your literary tastes go beyond the "Handbook" and the like, beg, borrow or steal it.

Visiting Melbourne during Christmas was Jack de Cure, ex 3WL, of DX fame, who originally put Coburg on the map as THE DX district. Did I hear a murmur? He is now a Radio Inspector in Adelaide, and is only active on 28 mc. under the call of 5KO. Looking particularly well, he is a dyed-in-the-wool South Australian, and Melbourne is just another town. How have the mighty



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fallen? From 3CB, who is still charming YL's with that dulcet voice on 200, we learn that 5CR was another South Australian to pay us a call during the holidays.

Probably as a result of the Christmas and New Year festivities, or what have you, the boys have gone all social. It was decided at the January KP meeting that future gatherings would end with a party, light refreshments being on the "bring your own" basis. Certainly sounds to have possibilities, and at least worth a try.

RX who has, between drinks, been restoring the worn-out tissues in Tasmania, is trying to solve the mystery of the lack of co-operation between the hams in the North and the South of that island. It sounds reminiscent of the Civil War with Union and Confederate States, but as they don't keep slaves in the South the reason is not so obvious.

The New Year seems to have ushered in an epidemic of ethereal activity. UG, US and NH are all in need of that yet uninvented sky hook. IG has been comparing the relative merits of two half waves in phase and a V beam, the latter winning by some lengths (literally and otherwise). CO puts his faith in half waves in phase on 14mc., and HK has adorned the back yard with a three element rotary close spaced beam on 28 mc., with encouraging results to both himself and the local sparrows.

Trying to stop self oscillation in 807's seems to be giving some of the boys headaches. DP has struck trouble with his, and it is at present in the hands of A.W.A. for a check. On top of this, his Super Gainer, usually a well behaved animal, began playing up. EV has apparently had better luck with his 807, and has been working good DX on 7 mc. Also on 7mc. is RN, who is building a modulator and would like a few ideas. I could think of one good one!

Between bouts of rebuilding, 3MR has been entertaining a YL friend of 7YL from Tasmania. 7YL, by the way, is now engaged to 7JB and vice versa. Victorian honours are upheld by PJ whose engagement was an-

nounced just before Christmas. To both couples, your correspondent's blessings. MR's new outfit is due to be pushing holes in the ether by the time this has gone to press—getting the bugs out will take him about as long as it takes the printer to dash off this issue!

With a new 8 tube super on the way, UM is deserting 14 mc. for 28 and 56 mc. Let's hope he starts a fashion—the hiding that poor unfortunate 14 mc. band has had in recent years should make Hertz turn in his grave. UM, with ZU, was also mived up in the Christmas Day hook-up with a string of stations, the call letters of which look like an Admiralty code message on the European situation.

Another couple of supporters of the 807 are AH and ZH. The former is installing 6B5's in a modulator for his 807 PA, and the latter has just finished a similar PA.

The recent tragic bush fires have again demonstrated the practical uses to which amateur radio can be put in times of emergency. Although in many cases communication was restored soon after amateurs and gear had been rushed to stricken areas, a great deal of excellent work was done, and it is to be hoped that the authorities will realise, more so than they have done in the past, the potential asset which the community possesses in an organisation such as ours.

## U.H.F. SECTION NOTES. (By 3JO)

Section meeting nights. — Third Tuesday every month at the W.I.A. Rooms at 2000 hours, the February meeting being on 21st.

Wanted—56 mc. schedules.

In the past, we have noticed, scattered about the various pages of A.R., 56 mc. skeds that someone is running for somebody's benefit. How much better would it be if all these were entered together? And what better place than at the beginning of these notes? We have also heard rumours of skeds which appear to be known to only a favoured few. What about letting everyone interested in on these,

# Amateur Radio

chaps? Drop us a line before the 18th of the month, and we'll do the rest. Strange as it may seem to some, these notes ARE read by many who are interested and who might be otherwise unaware of the skeds and thus be missing a great opportunity to open up the 56 mc. band.

Most of the VK3 chaps are still in the act of bringing their gear to a higher degree of efficiency before making any definite skeds. In the meantime we are active amongst ourselves at night time during the week, and more especially on Sunday nights.

Interest at present is mainly centred around the field day arranged for Sunday, February 26th. 3OF and 3OT will be located at Fish Creek and Mt. Tarrangower respectively, and fully expect to make definite contact this time, having heard each other on two previous occasions. Distance approx. 160 miles. The 3VH/JO combination intend trying the Arthur's Seat location, and 3ML will also be on location (unknown). Nothing definite is known about other portable stations, but we anticipate that many country stations, not obliterated by bush fires, will be about, and in VK7, Gil Miles, 7KQ, will be on top of Mt. Wellington with fone, tone mod., cw., beam antennae and a SUPER super-het.

Just prior to the holidays, tests were conducted by 3WT and 3BU in Geelong and 3HP, 3QR and 3JO in Melbourne. No 56 mc. signals were

heard at either end, but contact was made by 3QR and 3WT on 7 mc. The field day should give the hams at Geelong and other country centres an opportunity to try out their gear, and thus make the day more interesting for all concerned. Country stations intending to participate are asked to notify us of their locations and other details in order that we may be aware of their activities. Please let us have a copy of your field day log, chaps.

## EASTERN ZONE NOTES.

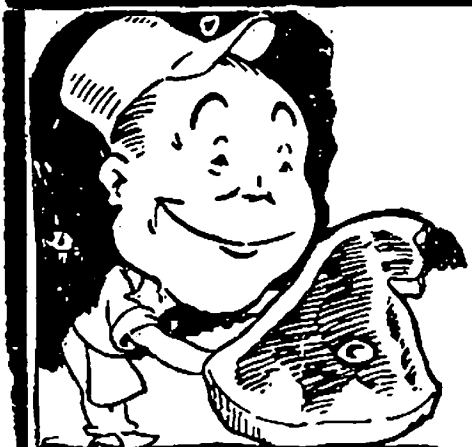
The recent disastrous bush fires, which were especially bad in this Zone, have shown us all how Ham Radio can rise to the occasion in an emergency, and our Zone President, 3WE, handled hundred or more telegrams when Omeo was cut off from the outside world. Other members of the zone who did their bit were 3XH, 3VG, 3XZ, also 3KM and 3EG in the N.E. 3PR stood by and tried to keep the channels used by the QRR stations clear.

Owing to the Christmas holidays, there has not been very much activity in this Zone.

Members are requested to remember that the Zone hook-up will start again at 8.30 p.m. on 80 mx on Thursday, 2nd February, and a full muster of members is requested.

3DI.—Jim is QRL with service work.

3EA.—Evan reported to be installing gear on his boat.



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3HZ.—Murray on occasionally, but 3UL keeps him busy.

3XZ.—Wee MacGregor has been getting his name in a well known weekly radio paper. Seems that a YL is troubling Mac. Hi!

3SS.—Keith has not been heard since the Maffra Show. Is the rig still wet?

3PR.—Ron manages to get on occasionally. Gave 20 mx a fly, but DX is scarce just now.

3WE.—Bill has 809's in class B as modulators now, and is putting out some good fone on 40 and 80 mx.

3OE.—Jack busy working a little DX in the early mornings.

## NORTHERN ZONE.

Plans for the Northern Zone Convention are under way, and further particulars will be given later.

Conditions for the past month have been far from pleasant owing to the very hot spell, but it is expected that DX conditions will improve shortly.

3TL.—Spending most of his time on 20 mx., and is working some very nice DX.

3OR.—Reckons that he has made an all-time record. Murray's antenna blew down, so he coupled his final tank to the fly-wire screen on 40 mx, and got RST 599 from 3XB. As the screen is a patent roll-up type, Murray reckons that he will be able to tune by rolling up the screen.

3JG.—Using an 804, with a modest input, continues to work DX on 20 mx.

3BM.—With a 120ft. stick and sundry Vee beams, thinks nothing of working anything at all.

3EP.—Late of Rochester, but now of Bendigo, is inactive as far as radio is concerned; lives next to 3QC in Bendigo. Guess Ted will come back with a rush one of these days.

3QC, of Bendigo.—What are you doing, Bruce?

3AI.—Is back on the air with a 19 CO and 10 final.

3IH.—Still works 3ZK on 80 mx.

3KY.—Punches holes on 40 mx with nice quality fone.

3DU-TC.—Spent a week with 3HX; succeeded in blowing 3HX's famous 6P6, and now 3HX is cleaning up the haywire.

## WESTERN ZONE NOTES.

(By VK3TW.)

Maybe I'm "non compus mentis," but I'll wager a cracked crystal that the Western Zone notes were posted at least fourteen days before the due date, but, so help me. I couldn't find 'em in the January issue. (Don't blame 3RX—he was in Tassie last month).

3SZ.—Stan fairly active on 40 mx phone, running about 2 watts and filling the carrier nicely.

3TN.—Still waiting on you, Mort.

3II.—Leigh vacationing by the briny; will soon be on QRP with 807 in the final.

3GN.—No much heard of you lately, George; has the push-pull sound track got you worried?

3TW.—Rebuilt again. What, again? And improves every time, too. Should have a respectable job in about two years at the present rate of progress.

3DZ.—Back in Portland, but has not been heard yet.

3NK.—Heard on 40 with very nice sigs.

3JA.—Genemotor went west again and now on with QRP from small genemotor working dx.

3WT.—Bemoaning the fact that he can't get any DX. Has very high noise level.

3OW.—Active occasionally, and working so nice DX.

3HG.—Another who lost his big genemotor, and now QRP. but still working the DX with no apparent loss in signal strength.

Our President requests a weekly Western Zone hook-up. Listen for 3PHG every Sunday at 10 a.m.

## PHONE SECTION NEWS AND NOTES.

I must apologise for the absence of these notes in the last issue of the magazine, but owing to the pressure of the Christmas rush I was unable to find time to prepare them.

The much discussed cricket match between the Phone Gang and the Key Punchers will definitely come off about the middle of March. Now Key chaps, you will have plenty of time to practise, and, believe me, you will need it.

Took a week-end trip down Mirboo North way a short time ago, and dragged the set along with me. On the 200 metre band the only one audible was 3LN, so the new rig must be good after all, Len. What's wrong with giving your call sign now and again, S.W. phone chaps? I listened to a couple of you on 20 metres a short while ago, and one did not give a call sign for over 40 minutes. Apart from regs., we like to know who you are.

This is all for the present, but there should be plenty in next month's issue as all your Xmas doings can be chronicled.

### South Australian Division

The Christmas meeting took

place on December 21st in the form of a social, and was a great success. The new syllabus will be available by now, to be followed by a special meeting of members this month to inaugurate the new constitution, which is hoped to be in action for the new financial year.

On Wednesday, 18th, at the general meeting after such destructive bush fires had swept the State, a discussion was held to bring all members into a highly organised body. See article elsewhere for full details of activity by hams in this State. Conditions on ten have been very poor over the last month or two. Twenty has been full of good DX, and the South Africans are quite easy to contact.

A new effort is to be made by Mr. Bourne, 5BU and 5KL to rebuild 5WI.

After the work done by those in operating portable stations in the fire areas, perhaps more emergency gear will be built and kept in readiness for such times as they are needed.

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## WAKEFIELD ZONE.

(By VK5RE.)

VK5LR.—Jack and Mrs. Jack have been for a motoring tour down through the South Eastern district of South Australia. Jack took a portable rig and had a real ham holiday.

Pete, of VK5GS, recently visited Mildura and met some of the VK3 boys.

VK5RE had a visit from Gordon Ragless, of 5GR fame, and Harry Wheeler, with the call of 5HW on his finger-tips. Gordon and Harry "went bush" and camped in the approved "swaggies" style, though they walked not—but sped in a motor car!

We in the country are always pleased to welcome our city friends, and it would be to the advantage of radio in general if interchange of visits were more frequent; all are welcome at this station.

Ron and Nancy Green have been away for a camp, and I have heard that Ron mistook the sea sand for salt, and since then he "grits" a little.

Saw Bert Stacey and YL dashing off on an "Angel-maker" (motor bike), so spose I'll have to start saving up for a present.

Harold Fisher has finished all his I.C.S. exams. Good luck!

Merv. Tucker has a beaut. big motor boat. Some day I'm going to be taken for an outing. So what about it, "Tuck"?

Allan Cunningham hard at his studies. Stick to it, Allan, and best of good luck, O.B.

Well, that's the "doings" this month, but, believe me, I would be pleased to get a note from any in my area.

## GREY ZONE.

(By VK5LC.)

Well, chaps, here we are in the new year, and still is darn hot. Been over 116 deg. for the last week.

Many thanks to Leith, VK5LG, Bill, VK5HR, and Tom, VK5TL, for letting me know their activities.

5LG.—Busy on 20 mx, and as the power is off on Sundays he doesn't QSY up, which is the reason

we don't hear him. Leith is using 42, 46, 809, link coupled throughout, and 50 watts input. Yes, radio waves do affect pigeons!

5TL.—Tom has built C.C. rig with two 19's.

5HR.—Good old, Bill, he couldn't stay off the air longer than a year. Going on high power, too!

We have another ham in this zone in 5GU, and Geoff Rosewarne is sitting for his ticket this month. Good luck, Geoff! Now, are you chaps members of the W.I.A.? If not, why not?

5NW.—Bob has been off the air mainly because he has not been at home week-ends, but now that he has been successful in getting his talkie op. ticket he is home to show week-ends.

5WG.—Wally has launched out in business; hard at it now as radio retailer and service man, so he is not on the air.

Ex-5FB.—Frank has gone to sea. Good place this weather. Let's hear from you, Frank, if you get "A.R."

5MP.—Don't hear much of your activities these days, Len.

5FW.—Although Eric is living in this zone, his station is not here, but a few notes won't hurt; he has gone into double harness. Congrats, Eric. Address is Gladstone. Let's hear that you are going on the air.

5BK.—What's happened to you, Jack? Do not hear much about you. Can't you get 5CK working O.K. so that you can put 5BK on?

5LC.—Have been down on 20 mx, but condx were bad; able to work VK2's by the dozen, but couldn't hear VK3's or VK5's here; only heard VK5's once (about 3 weeks ago) in seven years on 20 mx, and they were R9. Worked two K6's with 3 watts input, Q5, R7/5.

## BARKER ZONE.

(By VK5PN.)

Hello, chaps. First of all, let me tell you that I am writing the notes this month only because your Zone Officer has been taking a holiday. Yes, George, was in the city for a few days, and a real "ham" holiday it proved to be; visits to as many

shacks as time permitted, gathering ideas on fone systems, antennae, etc. Had a look at the Murray Bridge gang on his way home, and perhaps I had better leave it to George to tell you next month just what he saw, what he discussed, and so forth. Some of the South-Eastern chaps, I understand, have been doing distinguished work during the bush fire emergency. It is hoped that the full story will be available next month. Now, before I sign off, just a reminder. Your Zone Officer simply hates having to guess at what you do to pass away your radio hours, and really the rest of the gang have warm spots in their hearts for you, and invariably turn to this page first to read about you. Very well, then, reach for the pen and ink, and pour out your innermost thoughts into an epistle to VK5GW. He will do the rest. (And 3RX will have to censor some of it!)

## Western Australian Division

(By VK6WZ.)

Conditions have shown less change and present a much less interesting topic than personalities and details of rig changes. As far as present writer knows no VK6 is active on 1.7 or 3.5 mc. QRN is bad and sigs scarce so no wonder these bands are unpopuar. 7mc. shows usual weekend activity, but during week nights this band is almost as devoid of VK6 calls as the lower frequencies. A little DX may be worked now and again providing the ears will stand up to the battering of the noise level. 14 mc. still popular with Dx-ers but condx. still patchy. 28mc. spasmodic and nothing known of happenings on that band. 56 mc. still attracts a few regulars and in addition now boasts a regular schedule. It is that of 6BB (a five-mx stalwart surely), who goes on crystal-controlled mission every Wednesday and Thursday between 1300 and 1430 G.M.T. on 56.744 mc. Speech and music are radiated and the antenna at present used is non-directional. Reports eagerly awaited.

In the Winchell Way:—

Flash! 6WI actually on the air Sunday mornings . . . slow c.w. be-

tween 9.30 and 10 a.m. (Perth time) for country members, students and hams in general. Look on 7,000 kc.

Station-manager 6NL rashly volunteered to build modulator for 6WV1 if gear forthcoming. Offer snapped up . . . feverish activity on Val's part.

Reported missing—6YL, 6JC, 6ZZ, 6N, 6DF, 6PK, 6AR, and sundry others.

Another flash! (Across tank condenser—on modulation peaks) 6GB in trouble with new T40 final . . . won't behave . . . quality, too, not quite so good as with old rig. Jack's modulators are class-B 46'a nad not 6L6G'a as reported last month.

6YZ joining ranks of QRO merchants and rebuilding to the tune of 802 tri-tet; 802 buff-doub. and HY40 final. Fit fuses in your aerial coils, boys!

6WH heard calling 5WM (Bill Morris, ex-6WM) on 7 mc. c.w. lately. Any luck Ted?

6FL proud owner of two half waves in phase and working DX like nobody's business.

6RB and 6RU, two recent calls, former QRP, latter QRO.

Flash! Will VK stations outside of VK6 working friend "VK6BK" (xtal note, freq. near 7040) please get him to QTH?

6AH of Wiluna heard occasionally with strong signal in metropolitan area but rather distorted fone. Should be 100 per cent. signal when difficulty ironed out.

6AW very proud of his 25A6's.

6HT ? ? ?

6WG, late of Wiluna, said to be in Albany. How's about it, Wally?

6EC, late of Albany, now in Perth, still silent. Too much work, Eric?

6MN, one of the old timers to make an appearance on 7 and 14 mc. now and then.

6WL missing for a few weeks. How, Les?

6MW wrapped in deep silence. said to be on holidays.

6GM on at rare intervals.

Ditto his Field Day Committee henchman, 6FR.

6BB active on five.

6LW overheard working above in duplex QSO (7mc. versus 56 mc.) on recent afternoon.

Tasmanian Division

(By 7YL.)

The first meeting for the new year was held in the Y.M.C.A. rooms on the 10th. The attendance was much better than usual, and it is hoped that members will make every endeavour throughout the year to attend meetings whenever possible. In this way much more can be accomplished.

All VK7 members were very sorry to have to say "adieu" to 7JB, who has been transferred to VK2 for eight months. As it was impossible for him to stay at the meeting owing to a pressing engagement, it was agreed that members who were able should go to see him off on the "Zealandia."

Quite a few hams turned up and during the farewells "Buck" was presented with a little gift in the form of a pipe as a token of esteem from the members of this division.

Members of the North West coast and Queenstown who received magazines late last month must excuse, as the mags were held up in Launceston and were much later arriving here than those which came direct.

Will all members please note the change in address of QSL Bureau, and in future send their qsl's to VK7YL, c/o 547E, G.P.O., Hobart.

Owing to the fact that the humble scribe was rather lax last month no notes were forthcoming concerning the December meeting, so "better late than never." This meeting was very very poorly attended, but this was in all probability due to the fact that it was only a few days before Christmas and many members had to work back late and so were unable to attend. As both secretary and assistant ditto were amongst the poor unfortunates the meeting was conducted very ably by 7PA. Peter filled the breach in a most efficient manner.

We were glad to welcome 3RX from Melbourne for a day or so in Hobart. He gave us some helpful advice, and the hams who had the pleasure of meeting him were sorry his visit was so short. Cedric is still

wondering why there are not more accidents in VK7 because the traffic travels at such a terrific speed, hi!

Scandal:—

7AH.—"Pop," besides taking an active interest in the activities of the Institute, finds time to tend his several fine opossums and do a spot of building.

7JB.—"Buck" is now in Sydney, and probably at the moment sweltering in the heat doing bayonet drill. Bear up, "Buck," we're with you.

7CT.—Had a spot of bother with old man 'flu, but made a good recovery during Christmas holidays, we believe.

7GJ.—We are pleased to welcome you into W.I.A., o.m. Jack has been very active since acquiring his ticket, judging by number of qsl's. Some pretty fb dx too.

7LZ.—Col is a most consistent worker. Has almost completed working all zones. Needs only two or three more, and has some pretty rare dx amongst his contacts.

7RK.—Ray probably will not be on the air much for some time as he has acquired a mo' bike and side car. Rather snappy number. Probably will be known in Launceston as "the Red Terror."

7YL.—Has acquired 7JB's snappy little D2 xtal mike during his absence.

Well, that's all for this month, and if it's not too late, lots of uew year 73's.

JOY.

SUPPORT YOUR ADVERTISERS

## NORTHERN ZONE. (By VK7LZ.)

Of late the number of active amateurs in the North has dropped considerably; in the last All Band Contest we had only one representative, namely VK7AB, although we credit this to the fact that the biggest percentage of Tasmanian Amateurs are interested solely in DX.

Whilst mentioning DX I can safely state that the conditions this "season" have been well below par down here and in the Centenary Contest, well DX ceased to exist and to cap the lot the Launceston City Council cut off the power to a big percentage of Launceston for three hours early Sunday morning.

At present in the Northern Zone there are only about four or five really consistent stations on the air, but the activities of most are listed below:—

7KR.—Busy rebuilding, and by the scraps I can hear it seems as though when finished Chas. will have a station and a half.

7RK.—Mostly on for a while about 1 a.m. but of late it seems as though he doesn't get home before bed time. Let's know more for next time, Ray.

7CL.—Only on during school vacations and at present making up for lost time. Merv. is situated at Devonport the rest of the year and has no rig there. When are you going back, Merv.?

7AB.—On occasionally with phone on twenty and forty metres. Doug.

has enough contacts during contests to make up for these periodical spells. His score for the All Band Contest last November stands at 1138 points and 7AB complains of lack of interest in this contest. He worked all States, including VK9.

7BQ.—Trying to work his way down to ten metres and fractured a forty metre crystal before he got there. 7GJ tells me he was reading his watch instead of his mill-meter. Can I interest you in another crystal, BQ.

7GJ.—Jack is a newcomer to the Amateur Ranks and is already working good DX in a business-like manner. Averages about an antenna a week at present and not satisfied yet.

7QZ.—Inactive, but having a darn good time, he says. 7HY, 7AM and 7CJ also inactive.

7LC.—Now engineer at 7QT at Queenstown and not been on the air lately.

7DS.—Another recent addition to Amateur ranks; had trouble with his crystal rig and now using a M.O.P.A. Get that crystal going Hugh, you will find it better by far.

7LG.—Now using phone and getting ready to assemble a W8JK beam which will be the first around here.

7RZ.—Taken up residence on the mainland I believe.

7LZ.—Chasing DX still with fair results on twenty metres using phone and CW, and has hopes of a better transmitter in the near future.

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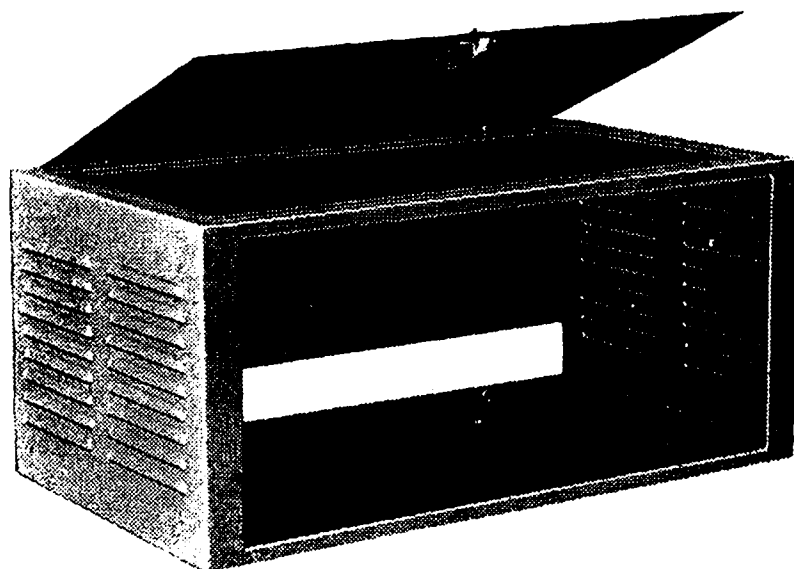
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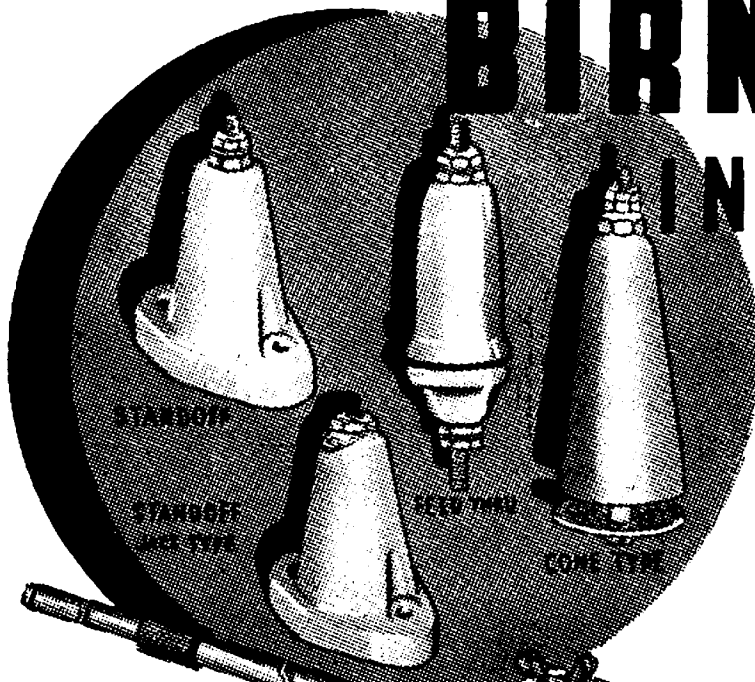


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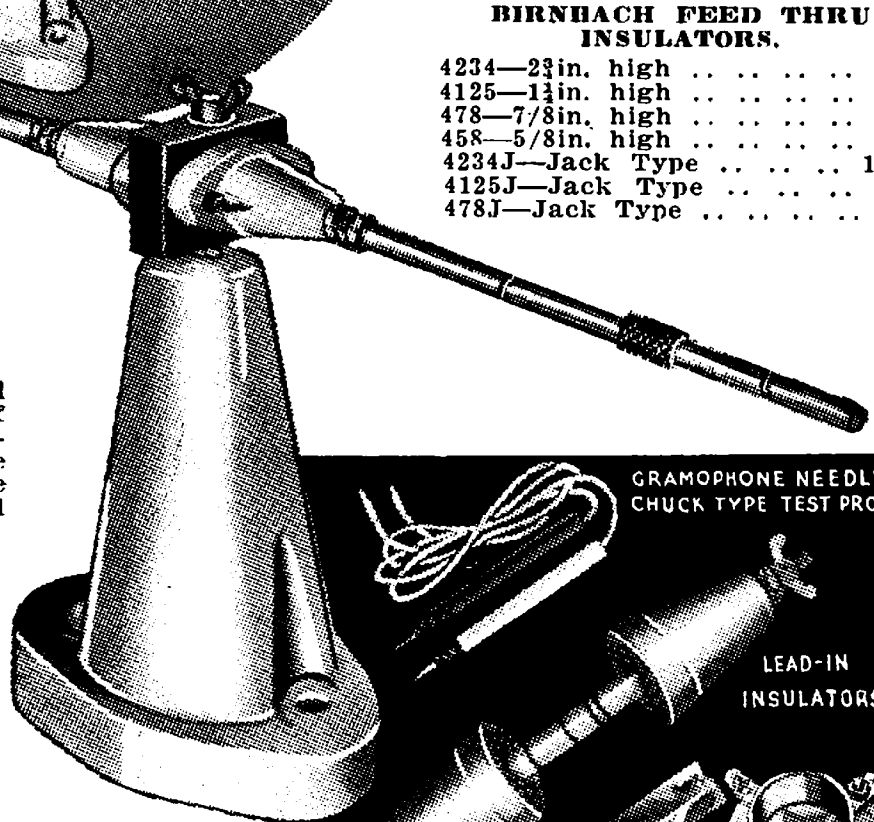
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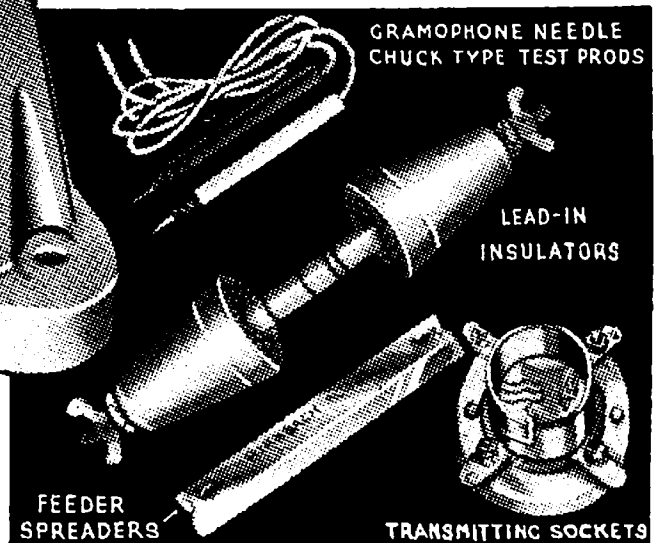
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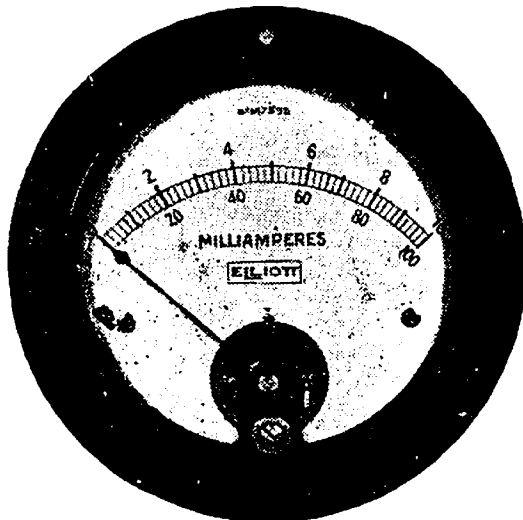
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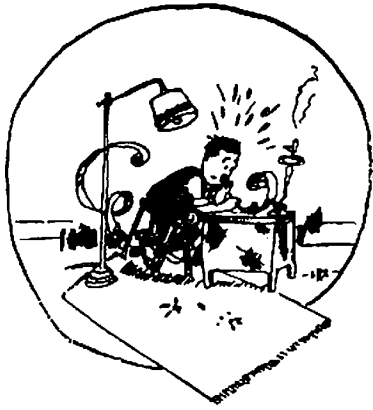
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# EDITORIAL

We are delighted to be able to publish details in this issue of the requirements for enlistment in the re-organised R.A.A.F. Wireless Reserve, for the Unit is one of which the W.I.A. is very proud. Manned as it is solely by Radio Amateurs, for one of the requirements is that an applicant must be an active Ham, it can truly be regarded as the Australian Amateurs' Own Defence Unit. Although there is no official connection between the Wireless Reserve and the Institute, we all take a very keen interest in its well being, for that Unit stands for some of the finest aspects of our Hobby, personal sacrifice of time, personal endeavour to excel as an operator, accurate and efficient station handling and operation, but, broader still, that Unit is our Hobby's contribution to our Country's Defence Forces.

The Institute for long has realised the immense potential value of our members in an emergency, a communications emergency, that is and the recent bush fire holocaust provides a shining example of what can be done by organised Amateur Radio. But from a Defence point of view an entirely different picture presents itself. Modern warfare requires highly trained specialists, and even the best Amateur operators could not be used in our modern war machine until they had received intensive Service procedure training. Realising this, the Institute took the initiative, and in 1929 approached the Defence Services with a scheme. The Air Force accepted the proposal, which, broadly, provided that the W.I.A. would provide the operators and the R.A.A.F. the facilities for Service training, all on an entirely voluntary basis. So successful did the scheme

work out in practice that the Air Force formed a special section of the Reserve in 1933 so as to bring the organisation officially into being as an integral part of the Air Force.

Now once again the scope of the Wireless Reserve is being enlarged so that it may play a yet more important part in the Defence plan. The full resources of the Institute are 100 per cent. behind the Unit, and all Divisional Councils are doing everything in their power to help.

A large number of Institute members are already serving in various units of the three Services, but if you are not one of these here is a wonderful opportunity. It is superfluous for use to say that we know you want to do your bit, so what better Unit could you enlist in than one composed solely of your fellow-Amateurs?

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## FEDERAL CONVENTION.

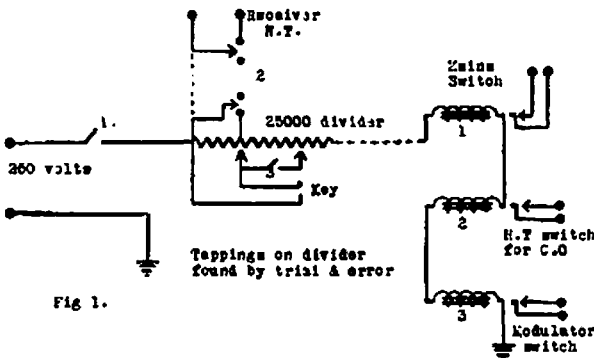
The 1939 Federal Convention will be held in Melbourne over the Easter holiday period. A varied and attractive programme of social events for visiting Hams, as well as their YF's or YL's has been arranged, the highlight of which is the Convention Dinner on Easter Saturday night, 8th April. The Victorian Divisional Council extends a cordial invitation to Country and Interstate Hams to spend the holiday period in Melbourne. You can be assured of a good time at the greatest Hamfest for years. Full details of arrangements and dinner tickets may be obtained from Vaughan Marshall, 3UK, the Convention Organiser.

## More about Switching

(From Ken Kelly, VK3LL.)

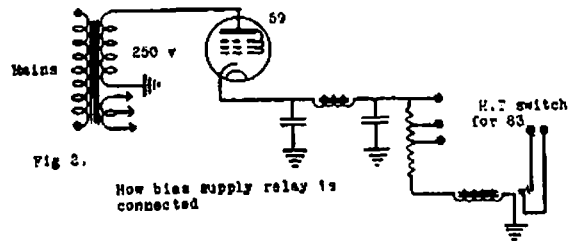
On reading this month's Amateur Radio I noticed an article on Switching—a subject in which I have always had quite an interest.

Without wishing to appear too critical, it seems to be that there were rather too many switches needed, with the result that the change over switch finally used was rather cumbersome.



I will describe the system used in my own rig, which, however, does present rather different problems. Briefly, I find it necessary to operate the transmitter 60 yards from the operating room; total control of the transmitter is carried out from three toggle switches on the receiver panel, change over being effected by a single switch. The actual control is by three relays. Now do not be scared off, as I used to be, by the mention of relays, they can be got for 2/- each, and only four are used (old P.M.G. relays).

The rig used here is 3 stage—6P6, 6L6G and 809, and also a modulator. Each stage has a separate power supply, and there is also a bias supply for the 809. Relay No. 1 switches on the power to all filaments. High tension is applied to the buffer stage, but very little current flows, as it is well biased by a cathode resistor. The bias supply uses an indirectly heated tube—I use a 59 with all grids tied to the plate—and in series with the bleed resistance is relay 4. This operates only after the 59 has heated up and passes current. During this period, the 83 mercury rectifier for the 809 supply has had time to get warm, and the H.T. to the 809 then automatically is applied by the closing of relay. This remains closed until the main relay turns off the whole transmitter. The 809 is biased to cut off,



and so there is no current flowing when no excitation. Now when relay 2 closes, the high tension to the C.O. is turned on and the rig is on the air.

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Relay 3 when closed turns on the H.T. (or else the transformer primary—whichever is preferred) in the modulator. Relay 3 has an extra contact, which shorts the modulation transformer secondary when the modulation is off.

### How the Relays are Operated.

The windings of the relays are in series. They should kick over at different currents. In my case No. 1 at 25 m/a, No. 2 at 35 m/a, and No. 3 at 50 m/a.

If the receiver supply can stand an extra 50 m/a, they can be operated from the receiver supply, otherwise another source of D.C. must be used—6 volt accumulator, or an ordinary type of power supply, capable of delivering 50 m/a. This does not need to be filtered.

The fundamental circuit is shown in fig. 1. The resistor used with a power supply can be a 25,000 ohm. voltage divider. With a 6 volt battery the resistance will be of the order of hundreds of ohms. If it is intended to use a 6 volt battery, low voltage relays must be used—i.e., low resistance. It is the current that passes in the circuit that matters, and the resistance is just to control this to the correct values.

It will be seen that switch 2 is also used to switch off the receiver when transmitting. Break in operation is possible by use of the key, and is always used for c.w.

No attempt has been made to give all the details, as this will vary with each transmitter, but the idea given should enable anybody to adapt it to his own purposes.

---

# World Radio Tour with VK3MR

---

Hop on your mega cycle and come with me on a tour of the world calling on the countries that we hear so much and sometimes work! This is not meant for a lesson in geography although it could well serve as such, so get out your map and lets go.

We will commence from the North Pole and work down through North America, West Indies and to the South Pole via South America. The first obvious country is Greenland (OX), crossing the Denmark Sea we come to Iceland, where TF3C operates, a few miles south east of Iceland are the Faeroes Islands and to the north west are the Jan Mayen Islands, both signing OY and Danish possessions. We now call at Newfoundland, Labrador (VO), and between this country and Nova Scotia are two little known islands signing FP8, Miquien and St. Pierre Islands (French). Then crossing Canada (VE) we arrive in Alaska where the K7s are. Pribolof Island to the west of K7 also sign that call. We hurriedly pass through the land of qrm and KW's, and pass through Mexico (XE), and continuing down the leg of Central America to Panama Canal we find in the following order Guatemala (TG), Salvador (YS), Hon-

duras (HR), British Honduras (VP1), Nicaragua (YN), Costa Rica and Cocos Island (TI), then comes Canal Zone (K5 and NY), and Panama (HP). Paying a visit to the West Indies, most of the VP gang are found. Referring to the list we find that VP1, 2, 5, 6, 7, 9 are in that region with VP8 right down the south of South America in the Falkland Islands. Included in the VP8's are South Georgia, S. Orkney and S. Shetland Islands but do not confuse these with Islands of the same name at the north of Scotland. British Guiana (VP3) is a South American country and Trinidad with Tobago Island (VP4) may be counted as South America for WAC awards. Other countries here are the familiar Cuban stations (CM and CO for fone), Haiti (HH) and our old fone pal HI7G in Dominican Republic. Several U.S.A. possessions, Puerto Rico (K4), Virgin Island (KB4), are to be found also, and two French Islands in Martinique (FM8) and Guadeloupe (FG8) with Curacao (PJ) and Dutch Island completing the list. In South America, we locate very easily in our maps the following: Argentina (LU), Bolivia (CP), Brazil (PY), Chile (CE), Columbia (HJ), Ecuador (HC), Paraguay

# Amateur Radio

(ZP, Peru (OA), Uruaguay (CX), and Venezuela (YV). In Guiana, besides VP3, we have Surinam (Netherlands) (PZ), and FY8 belonging to France. Coming nearer home, in the Pacific Ocean, are all the VRs, and they are quite easy to locate on any map, VR1 to VR6. We have New Zealand (ZL) and three N.Z. Mandates in Cook Island (ZK1), Niue (ZK2), and West Samoa (ZM). Chattam Island to the east of N.Z. can safely be counted as a new country and uses the second district call of ZL. France is credited with several islands and are: New Caledonia (FK8), New Hebrides (FU3), and a group of islands towards Pitcairn Island known as French Oceania (FO8). Since the advent of a flying service between U.S.A. and the Philippines and China, many of the small islands around the equator have been used as bases and have delighted the hearts of the century club aspirants with several new countries. These are set out in the list of countries and bear no repetition here. Passing through our own country, we are told that Tasmania can be counted as a separate country (three cheers as I have worked a VK7, on fone too). Looking over the Dutch East Indies we locate most of the VS boys. VS1 to VS6 is there, with VS7 (Ceylon) and VS 9 (Maldiv Island) just west of Ceylon and VS8 in the Bahrian Island situated in the Persian Gulf. That completed the VS gang and next month, if the editor permits, I will travel through Asia, Africa and Europe and will disclose the identities of the ZC, VQ and ZD countries.

## BRITISH ISLES.

England	..... G
Scotland	..... GM
Wales	..... GW
Isle of Man	..... G
Northern Ireland	..... GI
Irish Free State	..... EI

## BRITISH COUNTRIES AND MANDATES.

Australia	..... VK
Tasmania	..... VK7
Papua and Queensland	..... VK4
New Guinea	..... VK9
New Zealand	..... ZL
Canada and Nova Scotia	..... VE
New Foundland and Labrador	..... VO
India	..... VU
Sumatra	..... XZ

Union of South Africa ..... ZS

## VR1 to VR6 OCEANIA IS.

Gilbert, Ellice and Ocean Is.	... VR1
Fiji Is.	..... VR2
Fanning Is.	..... VR3
Solomon Is.	..... VR4
Tonga (Friendly Is.)	..... VR5
Pitcairn Is.	..... VR6
Samoa West	..... ZM
Cook Is. (N.Z. Mandate)	..... ZK1
Niue Is. (N.Z. Mandate)	..... ZK2
Chattam Is. (to New Zealand)	... ZL2

## VS1 to VS9.

Straits Settlements	..... VS1
Federated Malay States	..... VS2
Non Federated Malay States	..... VS3
British North Borneo (E. Indies)	VS4
Sarawak (E. Indies)	..... VS5
Hong Kong	..... VS6
Ceylon	..... VS7
Bahrian Is. (Persian Gulf)	..... VS8
Maldiv Is. (West of Ceylon)	..... VS9

## VP1 to VP9, WEST INDIES AND S. AMERICA.

British Honduras (Cent. America)	..... VP1
Leeward and Windward Is. (W. Indies)	..... VP2
British Guiana (S. America)	..... VP3
Trinidad and Tobago (South America)	..... VP4
Jamaica, Cayman, Turks and Caicos Is.	..... VP5
Barbados (W. Indies)	..... VP6
Bahama (W. Indies)	..... VP7
Falkland Is. (including S. Shetland, S. Georgia and S. Orkney Is., S. of S. Am.)	..... VP8
Bermuda (W. Indies)	..... VP9

## VQ1 to VQ9, in S. AFRICA and INDIAN OCEAN.

Zanzibar	..... VQ1
Rhodesia Northern	..... VQ2
Tanganyika	..... VQ3
Kenya	..... VQ4
Uganda	..... VQ5
Somaliland British	..... VQ6
.....	..... VQ7
Mauritius and Chagos Is. (Ind. Ocean)	..... VQ8
Scyhellles (Ind. Ocean)	..... VQ9

## ZD1 to ZD8, SOUTH AFRICA and S. ANT.

Sierra Leone	..... ZD1
Nigeria (Brit. Cameroons)	..... ZD2
Gambia	..... ZD3
Gold Coast (Brit. Togoland)	..... ZD4
.....	..... ZD5
Nyassland	..... ZD6
St. Helena (S. Atlantic)	..... ZD7
Ascensions Is. (S. Atlantic)	..... ZD8



# Amateur Radio

## ZC1 to ZC6, MED. SEA and IND. OCEAN.

Transjordan	ZC1
Cocos Is. (Ind. Ocean)	ZC2
Christmas Is. (Ind. Ocean)	ZC3
Cyprus (Med. Sea)	ZC4
	ZC5
Palestine	ZC6
Malta (Med. Sea)	ZB1
Gibraltar (Med. Sea)	ZB2
Tristan Da Cunha (S. Atlantic)	ZU9
South West Africa	ZS3
Rhodesia South	ZE
Anglo Egyptian Sudan	ST
Egypt	SU

## AMERICA & COLONIES.

U.S.A.	W
Alaska and Pribolof Is.	K7
Puerto Rico (W. Indies)	K4
Virgin Is. (W. Indies)	KB4
Canal Zone	NY & K5

## OCEANIC IS. (U.S.A.)

Hawaiian Is.	K6
Guam	KB6
Wake Group	KC6
Midway Is.	KD6
Johnston Is.	KE6
Baker, Howland and Phoenix Group	KF6
Jarvis and Palmyra Group	KG6
American Samoa	KH6

## FRANCE & COLONIES.

France	F
French India	FN
French Morocco	CN
French Indochina	FI8
French Oceania	FO8
French West Africa	FF8
French Guiana (S. America)	FY8
French Cameroons (Africa)	FES
French Togoland (Africa)	FDS
French Somaliland (Africa)	FL8
Tunisia (N. Africa)	FT4
New Caledonia (Pacific)	FK8
New Hebrides (Pacific)	FUS

Martinique (W. Indies)	FM3
Algeria (N. Africa)	FA
Reunion Is. (E. of Madagascar)	FR3
Madagascar (Ind. Ocean)	FBS
Miquelen and St. Pierre Is. (N. Atlantic)	FP8
Guadeloupe (W. Indies)	FG8
French Equatorial Africa	FQ8

## PORTUGAL & COLONIES.

Portugal	CT1
Azores (N. Atlantic)	CT2
Madeira Is. (N. Atlantic)	CT3
Cape Verde Is. (N. Atlantic)	CR4
Guinea (E. Indies)	CR5
Angolo (S. Africa)	CR6
Mozambique (Afric)	CR7
Goa (India West Side)	CR8
Macua (China, S. China Sea)	CR9
Timor (Timor Sea)	CR10

## SPAIN & COLONIES.

Spain	EA
Balearic Is. (Med. Sea)	EAG
Canary Is. (N. Atlantic)	EAS
Morocco (Spanish)	EA9

## NETHERLANDS, DUTCH EAST INDIES, SOUTH AMERICA.

Holland	PA0
Curacoa (W. Indies)	UJ
Guiana (South America)	PZ
Java Proper	PK123
Sumatra	PK4
Borneo	PK5
Celebes Molucca & New Guinea	PK6

## SOVIET UNION, EUROPE & ASIA.

European Socialist Fed. Rep.	U1-3
White Russia Socialist Rep.	U2
Ukranian Socialist Republic	U5
Transcaucasian Socialist Fed.	
Soviet Republic	II6
Uzbek Soviet Socialist Republic (Uzbekistan)	II8
Asiatic Russian S.F.S.R.	II9

## MISCELLANEOUS COUNTRIES.

### Europe.

Albania	ZA
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Estonia .....	ES
Danzig .....	YM
Finland .....	OH
Germany and Austria .....	D
Greece .....	SV
Hungary .....	HA
Italy .....	I
Latvia .....	YL
Lithuania .....	LY
Luxembourg .....	LX
Norway .....	LA
Denmark .....	OZ
Poland .....	SP
Roumania .....	YR
Sweden .....	SM
Switzerland .....	HB
Turkey .....	TA
Yugoslavia .....	YT, YU

### Africa.

Belgian Congo .....	OQ
Ethiopia .....	ET
Liberia .....	EL

### Asia and East Indies.

Afghanistan .....	YA
China .....	XU
Chosen (Korean) to Japan .....	J8
Hejaz (Arabia) .....	HZ
Iran (Persia) .....	EP
Iraq (Mecopotamia) .....	YI
Japan .....	J
Manchukuo (N. China) .....	MX
Philippine Is. (U.S.A.) .....	KA
Taiwan (Formosa) to Japan .....	J9
Tibet .....	AC4
Siam .....	HS

### North America and West Indies.

Cuba .....	(Fone CO), CW, CM
Costa Rica and Cocos Is. ....	T1
Domonican Republic (W. Indies)	HI
Faeroes and Jan Mayen Is. (Greenland Sea) .....	OY
Greenland .....	OX
Guatemala (Cent. Amer.) .....	TG
Haiti (West Indies) .....	HH
Honduras (Cent. Amer.) .....	HR
Iceland .....	TF
Mexico .....	XE
Nicaragua (Cent. Amer.) .....	YN
Panama .....	HP
Salvador (Cent. Amer.) .....	YS

### South America.

Argentina .....	LU
Bolivia .....	CP
Brazil .....	PY
Chile .....	CE
Columbia .....	HJ
Ecuador .....	HC

Paraguay .....	ZP
Peru .....	OA
Uruguay .....	CX
Venezuela .....	YV

## Correspondence

Box 7,  
Omeo,  
19/1/39.

The Editor "Amateur Radio."

Sir,

I have been requested by the president and members of the Omeo Relief Committee to express through "A.R." their deep gratitude and appreciation to all those fellow amateurs who associated themselves so wholeheartedly and efficiently with me in handling emergency traffic during the bush fire at Omeo and until communications were restored thereafter. May I add my personal thanks for the unhesitating and capable manner in which the boys disposed of the very varied traffic from 3.30 a.m. on Saturday until midnight on Monday last, during which a rough check-up reveals that some 731 messages passed. My very good friends, 3FL, 3NI and 3QG shared most of this, but there were many others assisting in forwarding messages or policing the channels. I have long held confirmed views on what radio amateurs could do in an emergency, and events of the past week (for the second time in 2½ years from this Q.R.A.) have amply justified that opinion. Thank you, boys.

A. R. WILLIAMS.  
3WE, "Bill."

S.S. Ormonde,  
1/2/39.

The Editor "Amateur Radio."

Dear Sir,

I wish to thank the hams in the VK4 Division for the enjoyable time I spent with them. VK4JP, George, has certainly got some rig out there. I enjoyed operating 4JP's gear. Working DX is no trouble at all to George. While I was in the shack that was in the early afternoon the Ws seem to hear George on phone at a very nice solid R9. This was on 14mc. Certainly that rotating

## Amateur Radio

beam does its stuff. VK4PX, Arthur, has a nice little QRP job and has certainly been working DX on 14 mc. C.W. VK4CX, John, has also a nice little F.B. rack, also QRP, but very effective. I hope when I arrive home in Scotland on 12th March that my 14 mc. rack reaches as far as the VK4 division. So any VK, if he is around the H.F. end of the band I will only be too pleased to have a contact. Thanking 4JP, 4PX and 4CX for their true ham spirit and only hoping I can do the same for them, or any other VK, when he comes over to Scotland.—Yours etc.,

ERIC W. STEWART,  
GM3HX.

Mr. W. R. Gronow,  
2 Anthony street,  
Glen Iris, S.E.6.

Dear Sir,

I desire to acknowledge the receipt of your letter of the 3rd inst., and was particularly interested to read of the activities of your mem-

bers in providing emergency communication during the recent disastrous bush fire period, and I will be very pleased if you will extend to your fellow members my very keen personal appreciation of their public spirited efforts in this direction.—Yours etc.,

GALBRAITH,  
Chairman  
Forests Commission of Victoria.

The President,  
Wireless Institute of Australia,  
191 Queen street,  
Melbourne, C.1.

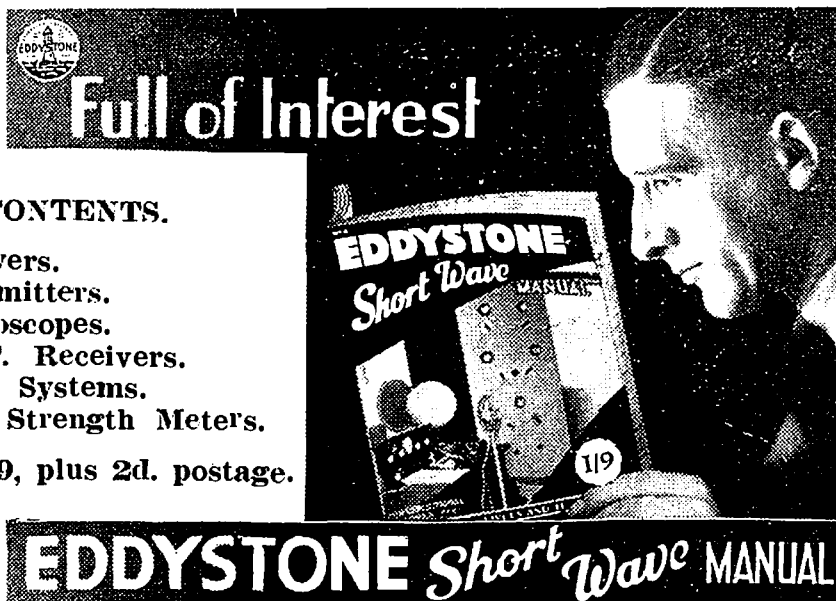
Dear Sir,

Will you please accept on behalf of yourself and your members who so promptly and capably handled urgent re traffic via portable amateur radio stations during the recent disastrous bush fires, the grateful thanks of this Commission.—Yours etc.,

G. K. COCKBURN,  
Secretary,  
Forests Commission of Victoria.

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Applicants must:

- (1) Be of a standard physical fitness equivalent to that required for enlistment in the Citizen Air Force, and should be aged between 18 and 40 years.
- (2) Own an Experimental Wireless Transmitter licensed by the P.M.G.'s Department.
- (3) Be able to send and receive accurately at 16 w.p.m.
- (4) Not be under an obligation to serve in the Naval, Military or Air Forces, nor be a member of the Police Force.
- (5) Be prepared to carry out certain prescribed training, and attend the Annual Camp.

Amateurs enlist for a period of four years. The Air Board may, however, dispense with the services of a member at any time for failing to complete his training or for any other reason, and a member may terminate his engagement, except in a time of National Emergency, by giving 14 days' notice in writing to the Secretary of the Air Board.

All training is carried out from the Home Station, except at the Annual Camp, at which advanced training and instruction in allied subjects is given. In addition, two Field Exercises are held annually. Home training is carried out by regular weekly schedules, but when a member attains a certain standard of efficiency he attends special schedules only. The Air Force supplies each member with a crystal ground to his section frequency, he is given an Air Force call sign, and is supplied with

the necessary log books, message pads, manuals, etc.

The life of a Reserve Member is varied and interesting. Traffic is something not permitted to be handled by the Australian Amateur, but as a Reservist he can handle as much Wireless Reserve traffic in his section as time permits. He learns methods of encoding and decoding messages and handles many in cypher. He learns both W/T and R/T Procedure, and by regularly handling traffic finds that his ability as an operator increases immensely. The aim of the Wireless Reserve is a fine one for the Amateurs, through their Hobby, provide an efficient Wireless Unit for the Air Force at very little cost to the country.

Applications for enlistment should be sent to The Secretary, THE AIR BOARD, VICTORIA BARRACKS, ST. KILDA ROAD, MELBOURNE, SC.1.

### Another Certificate for the Pot Hunters

(Broadcast from W1AW and via  
VK3HG.)

A new "worked all VE" operators' certificate has just been made available to all amateurs by the VE operators' association. Applicants should use two bands in submitting proof of contacts with two stations in each province. Yukon territory and Northwest territories are considered part of the British Columbia. All contacts must be made from one state or province. If you are a member of the VE operators association, 106 Warvis street, Toronto, Ontario, fee is waived, otherwise send 25 cents with your eighteen cards to defray handling charges on your "Worked all VE" certificate.

## Federal and Victorian QSL Bureau

(R. E. Jones, VK3RJ, QSL Manager)

The new QSL Manager for W3 is Maurice Downs, W3WU, 1311 Sheridan street, N.W., Washington, D.C., U.S.A.

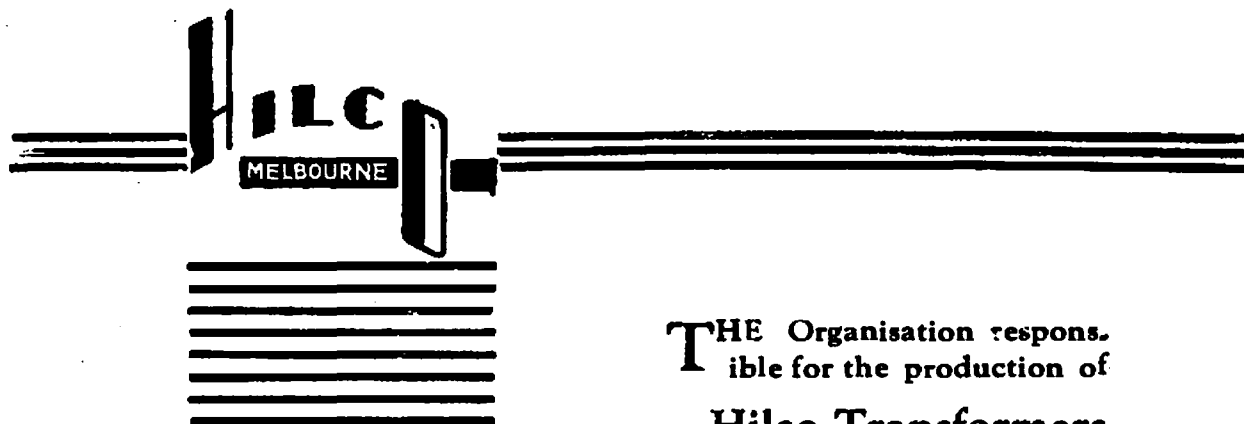
VS7GJ advises through VK7CL that he will be on an eight months' vacation to Europe from 25/3/39 and there will of course be some delay in answering QSL's.

Speaking of vacations reminds me that I will be on annual leave for three weeks from 1st March. Tentative itinerary provides for a fortnight in the Ballarat Rokewood district in search of the valuable but elusive yellow metal. Correspondence will suffer some delay during this period.

Some interesting info on EP5SO (operated by G5SO) comes to hand via VK3GP. The station is situated at an altitude of 5,000 feet near the North West frontier of Persia and is a TPTG using 2 watts from receiver batteries, yet is Q4 R5 in VK.

VK3WL, Wal Nye, late of Coburg, but now in a spanking new home right opposite this QSL bureau, will have to guarantee the QSL manager immunity from QRM before Wal's masts are released from voluntary imprisonment underneath the bureau, where they were stored during the erection of Wal's home.

Cards for the undermentioned VK3 stations are wearing out their welcome at the Bureau, 23 Landale street, Box Hill. A 2d. stamp will find them a new home:—VK3AC, AD, AP, AT, BE, BF, BH, BK, CA, CQ, CU, DC, DE, DU, DZ, EH, EI, EO, EY, FS, FT, FZ, GE, GJ, GO, GU, HB, HE, HI, HP, HS, HV, IB, ID, IJ, IF, IK, IL, IN, IP, IV, JH, JL, JM, JN, JS, JV, JZ, KC, KL, KM, KP, KQ, KS, KT, KY, LG, LD, LQ, LM, LW, LX, MJ, NF, NG, NT, OL, OQ, OP, OF, PH, PJ, PK, PF, PN, PS, PV, PZ, QC, QG, QF, QO, QR, QT, RA, RF, RQ, RR, RZ, SD, SE, SC, SM, ST, SK, SZ, TC, TD, TK, TP, TU, TY, TZ, UF, UG, UO, US, VD, VK, VG, VJ, VM, VN, VP, VY, WU, WX, XC, XA, XE, XH, YF, YM, YR, YS, YQ, YT, YW, YZ, ZA, ZF, ZG, ZD, ZS, ZW, ZL.



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## 28 and 56 M.C. Notes

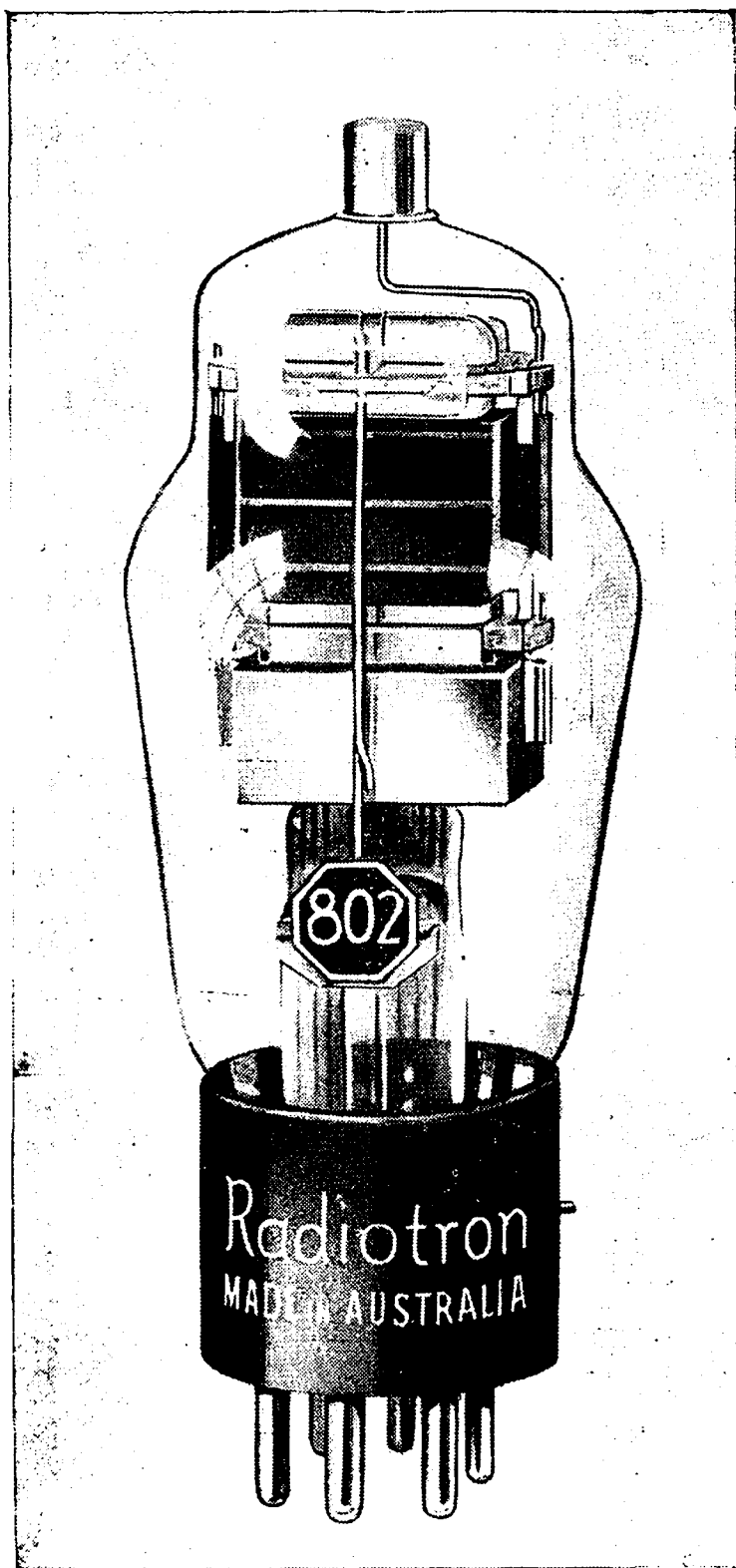
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(By A. Pritchard, VK3CP.)

Conditions on ten metres show about the same activity as last month except that New Zealand stations are coming through with more strength than we have heard for several months, showing that the skip is shortening. The Europeans are heard only occasionally, yet many are on the air during the evenings they do come through. PAOFB is the most outstanding and has been contacted by most of the local gang. We are finding the various districts in the States coming through at quite different times from what we have been accustomed to hearing them. A year ago the East Coast stations W1, 2 and 3 very seldom came through later than 8 a.m. At present they come through as late as 11 a.m. The accustomed 10.30 a.m. fade out for W9 signals has increased until a little after noon. The W7s were in the past at their best at 1.30 p.m., but the peak is now around 11 a.m. The VE5s seem to be the latest consistent sigs and 2 p.m. shows fair strength from that quarter. The W6s, those famous Californian Kilo Watts (or more likely—more!) phones come through all the time—hi!!—during the morning and until 2 p.m. The majority in the States are using the now famous three element close spaced beam and as they have such a tremendous gain in the aimed direction for receiving, the problem has arisen now that, during their interstate contacts, there is less likelihood of our signals being heard by their great numbers except during the week-ends when they listen for us. There is the same trouble with the Europeans because they have their beams pointed towards the States. It is fortunate that ten metres started with zepp antennae because we have had the opportunity to find out approximately the most suitable times for contacts with the different parts.

The following times will give a fair indication for listening:—On

the average 6.30 a.m. till 2 p.m. for the States and up till 5.30 p.m. for K6s; 4.30 p.m. till 6.30 p.m. for South Africa; 6.30 p.m. till 8 p.m. for Asia and Northern Oceania; 7 p.m. till 11 p.m. for Europe. South Americans have been heard at 9 a.m., 11 a.m. and LU contacted by VK3YP at 3 p.m., so any definite time for that continent is rather difficult to foretell. An interesting letter from VK5KL shows slack conditions for the last few months, 5ZU is building a 70 feet lattice mast which is nearing completion for a 5 mx beam array. VK5KL is rebuilding for 5 mx with a 6L6 co, 6L6G dblr to 10 and TZ 20 dblr to 5mx. There are many using cw at present and PK6XX, VS6OA and VU2AN are fairly consistent between 6 and 8 p.m. at the week-ends. VK3BW is getting fair efficiency on 5 mx with his 100 TH final driven by an 808 doubler from 10. The Trimax driver and universal output mod. trans gives us good phone from the class B stage. VK2UC and 2ADT are heard called by the Ws, but are inaudible here. VK3BQ has been testing the Y match on 2 half waves in phase but a new 3 element beam gives a 4 R gain over anything yet tried by Max. A new receiver using 1500 KC IF's, is on the way. 3CZ has R9 contacts with Ws and yet another 3 element beam, hi!! VK3HK has the rotating mechanism well nigh perfect. It consists of a 9 inch diam. wood drum fixed under the beam cross support, which has the support shaft through the centre. An endless rope goes round this drum then to the side over a fixed double pulley block, then down to another pulley block near the bottom of the pole (which has a movable weight to keep the ropes always tight), then across to the shack and around a larger drum which has a shaft through the wall to the turning wheel inside. Keith has had r8 contacts on phone with PAOFB and r8 cw with GM6RV apart from the usual Ws.



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# RADIOTRONS

## FK8AA

(By Ray Graf.)

Being the writer's good fortune to have his annual holidays coincide with the time that there was a cruise to Noumea, he availed himself of the trip, and besides seeing many interesting things, gleaned the following information about FK8AA, whom he met. He is a Frenchman, and knowing only about a dozen words of English, conversation was fairly difficult.

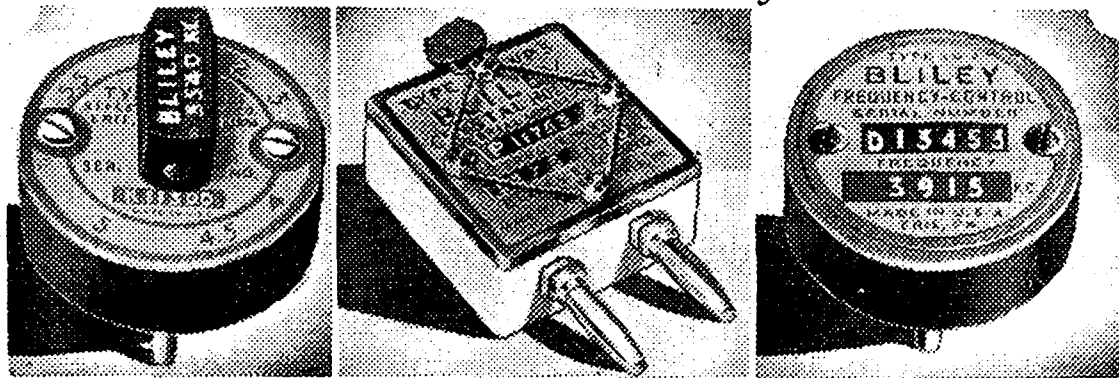
The QRA is at 44 Rue de l'Alma at the far side of the town from the quay. The transmitter consists of a 2A5 xtal osc. 6L6G buffer link coupled to a pair of 801s in push pull with the power being between 40 and 70 watts. The receiver is an O-V-I 57 det and 2A5 audio. The antenna is a single wire fed Hertz 24.5 metres long and tapped 6.75

metres oc centre. The bands used for ham work are 20 and 40 mx.

On every Wednesday and Saturday between 1830 and 1930 FK8AA transmits on 49 metres under the call of Radio Noumea. He appreciates any reports and always acknowledges them with his station QSL.



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## VK3MR's DX Notes

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The BERU tests are well over now and by the time these notes are read we will be at the ARRL battle. Very much regret that no rules of the BERU tests were available, but they only arrived this month. Conditions during the four days seemed very good and many of the rarer British countries were worked. The new rules have met with general favour and some high scores are anticipated.

2DG scored 781 points and is very pleased at the whole thing as he worked five new countries, which brings his total up to 122. Fine work Keith OM. Keith is sending his two junior ops. to his mother-in-law's house during the next test. It is hard to understand why VU7BR signs that call when it should be VS8 for Bahrians Is. Light will dawn later I hope. Some choice ones worked by 2DG in the senior BERU are VU7BR, ZC6EC, ST6LR, VQ3HJP, VP3ZA, VPIAA and several XZs. By the sound of ZC6EC's fist it might be old SU1EC who has been absent for some time on leave in England.

VK2NQ passed this dope on via 3BM. Has worked some good 'uns in CP1AA, 14300 kc, 5.30 p.m.; VO6B in W fone band (that's a rare one); ZP2AC, 14130 kc; FA3HC, 14130 kc, 5 p.m.; LA8C, 14100 kc. 2GM is making it a hobby working CN stations. He reports CN8AW, 14035 kc, 6.30 a.m.; CN8BA, 14095 kc and CN8MB, also 14095 kc. AC4YN was worked by 3OW on 14350 kc. and his "close" cousin worked TG9BA, 14250 kc. 3HG heard a lot of Ws on 7 mc at 10.30 a.m. on 7th February. Most unusual time and doubt very much if they can be worked. Has anybody ever worked the west coast of U.S.A. on 7 or 14 mc. the long way round—that is from 6 a.m. onwards?. It is easy on 28 mc as the sigs come straight across, whereas the 7 and 14 mc sigs come via South Africa.

We read with interest VK2AHM's work with qrp using Vee Beams and the value of this type of aerial is again brought before us by 3XB, who uses a 19 in the PA and has worked a W8 with .04 W on 7 mc, of all bands. His Vee has  $3\frac{1}{2}$  waves on this band. He has worked 29 zones,

but is still looking for South America for WAC (who isn't?). His line up is as follows:—19 PP Xtal Osc. 100 volts; 19 push pull doubler, 180 volts and 19 PP 300 volts, about 9 watts max. Guess the bcl's must suffer in Rupanyip! The D's signing, call with "W" on the end are ex "OE" stations, which is interesting to note.

Fone.—These he men have still been doing some good work on 14 mc and have had a slight setback on learning that CN1AF is a pirate! Cheer up boys, there is still CN1C on 14100 kc. 3HG can still work a few South Americans on fone; he contacted CE1AH and HK5AR on about 9 p.m. when they come through very well most nights now. VK7AB has plate modulation now and finds it much better than grid (I notice) and is looking for South Africa now for WAC fone. Try about 2 a.m. Doug and all will be well. Let's see what 3BM has been up to! I had a personal qso with Bruce while he was down in the city lasting from 6 p.m. to 2 a.m. next morning. Bruce has decided that dx is too easy on CW after this chat so he is sticking to fone (what a weak excuse, Bruce! Can't you get the BFO to osc after all?). He reports OA4AI, 14100 kc, 9 p.m.

What's this I hear about VK7JB and 7KV not qsling to VP9G who worked them about two years ago, and they are the only VK7s he has worked! Shame on you Buck! 3BM worked him at 6.20 a.m. the long way. FN1C's qra is Dave Patterson, Gongalpara, Chandernagore, which is in French India, 15 miles north of Calcutta. He is a Scotchman in the diplomatic service. 2GM also doing a lot on 30 watt fone and reports FN1C, VP6LN and FB8AH, who is a French doctor and speaks English very well. ZC6E is also working on fone as well as CW and only can operate when the army rig is off. VQ2HC, 14060 kc, can be worked about 3 a.m. most mornings.

Conditions are on the improve lately so some real dx will be worked during the winter. Best of luck to all and good hunting in the Yank test.

## Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 10th of the month preceding publication.

### N.S.W. Division

#### ZONE 5 NOTES. (VK2IG.)

Hot weather and QRN have been keeping the locals quiet and the DX is not so easy to raise.

VK2OJ is away on a cruise for his holidays. We sure envy Noel this weather.

VK2AP busy settling down to married life and not much time for radio.

VK2QE got his rig out but put it away again as too qrl.

VK2QD.—We forgot to mention that Hilton was on the air. Oh yeah! All the neighbours knew it. He's learning to play (?) the trumpet!

VK2EU is busting his bankroll on a super speech amp. and modulator and tells the boys to look out for their recvrs.

VK2VK home and started in to rebuild his rig. The result is that most of the locals are off the air after handing VK back his bits and lending him other bits he wanted. Ham spirit!

No news from Wagga or from 2AFD. We reckon that they still live es have heard 2AEO working the DX.

VK2IG reckons that the winner of the BERU is lucky as 2IG didn't read the rules properly and so missed the contests! Hi!. Remodelling again.

We are still hoping that some gink with more time than sense will send us some news one of these days from other parts of this zone and if the depression still bothers the afore-said ginks they can send the news along C.O.D.!

#### BORDER DX NOTES.

DX heard and worked in this zone this last month are as follow:—

CT1PC on CW is T9 on about 14350 at 2000 E.S.T. CN8AN chirpy

qri T8 about 14365 at 2000 to 2200. PK4KO is old PK2KO and with PK4KS any evening is T9 about 14350 to 14360. FU8AA chirpy and creeps from 14365 to 14355 T7 in early pm's. GW5MD T9 on 14365 around 2000. GM5DM and GM8FB ditto. XZ2LZ is old VU2LZ T9 and with XZ2JB pounds in most evenings. MX4AH varies from T9 to T6 on 14330 from 2100 to 2300. OA4R T9 at 2100 on 14250. CS2V.—Don't kid yourself you have got a new country here unless Portugal is not on your list as this is an experimental station at Lisbon. T9 at 2000 to 2200 around 14350.

Others listed are LA7A, LA7W, EI4J, HC1FG, HC1JW, KC6DHW, KD6LH, ZC<sub>6</sub>EC, VP1JR and VP7NT. Those KC, KD and KF stations can be contacted during the mornings around 11 a.m. quite often.

#### Coalfields Notes — — — — —

2PZ.—Active on 20 metre band, using class B modulation, working the usual dx which is about, leaving this week on annual holidays.

2CW.—Inactive on 40 metres, very little doing in radio, interested in Y.L. at the moment.

2KQ.—Active on 80 metres, usual rag chews which one finds on that band, have not had the pleasure of meeting you yet, O.M.

2ACQ.—Using 20 metres, also 40, fairly active and having some good QSO's with 2CX, another local who keeps him company.

2YL.—Always on 20 or 40 metres, dragging in the usual dx on phone, sorry I was not at home O.M. when you called.

2DG.—Very active, and in the B.E.R.U. in both sections and doing very well, has a nice array of certificates in shack since I saw it last, changing to 6P6 E.C. to a 807 and

808 final, still using the good old zepp with 119 countries tacked to it, and 50 watts input.

2XT.—Looking around for some suitable shack to start up again in Kurri Kurri, has a nice two seater to gallop about in, doing a fair bit of service work.

2KE.—You promised to get going in the new year OM, so far I have not heard you warm the tubes up O.M.

2YO.—Hear you working a few phone stations now and again on 20 metres, complains about the hot weather. Hoping to see you soon.

2KZ.—Doing very little in radio, busy otherwise at the moment, but on 20 metres when active, trying to arrange trip for all this area to visit the new B Class station 2K of Cessnock; also hiding a little cash from the Y.F. so as the O.M. can buy a modulation unit.

## Victorian Division

### SW AND BC SECTION.

No news re December meeting as these sections do not meet. January meeting usual "gang," and was to have continuation of VK3LN's trip through U.S.A. via films, but will be continued in the February meeting, 28th, and all members of W.I.A.—fone sections—cordially invited. Rather a lengthy discussion took place re portables in the cases of emergency and a committee was formed to go into detail of the procedure for these emergencies. A visitor from Sale, VK3RG, who took a part in the recent bush fires, gave a short talk on his work in same, and very interesting. Now for some doings of the hams.

3AM on 20 makes a name for himself as he also does on 200, believe to be removing again? Seems bad, Arthur? Quality never varies.

3BY with 3TH at the helm on 200 metres, usual standard.

3DH active on 5-20-200 metres, excellent transmission.

3HK a vee beam 7 wavelengths for 20 and active on 200 metres.

3GK only on 200 metres, believe to be constructing SW transmitter.

3RI usual standard of transmission. 3PA, 200 metres, makes a noise and fb quality. 3GY active on 200, can't say if you can be heard on 20 or 40 metres. 3FL of bush fire

fame active on 10, 40 and 80, likewise 200 and a crystal mike. 3CB still low power 200 metre fone, but slowly increasing power and gradually coming on to 40. 3LN plenty of noise and fb quality, 200 metres, cant say about 40 and 20. 3JR good quality, but breaks up occasionally; keeps sked with VK3GK, 3RI, 3CB Sunday mornings between 7 and 8 a.m. on 200 metres. He is also active in 20 with a beam ant.

3IW active on 20 fone, also did a little work in recent bush fire trouble; recently installed an eco for 20 metres. 3EM fb fone and must confess that always enjoy listening to Henry's voice. 3TW always seems to have a new transmitter, but quality fb; good work, Tim. 3CB active on the listening side, slowly building sw transmitter. A new ham, VK3UC, about 100 yards away, keeps Richmond on the map (cw only). 3EF never tires or sleeps? 3SO believe to be a great noise on fone 20, but a little selfish.

If you SW fone boys want your activities known, let me have the information as I am no thought reader and besides, it is up to you to include them in the mag. as it not only helps our book, but it helps yourselves.

3JB.—What has happened to you?  
WM. F. SIEVERS.

### Key Section Notes (By COC.)

The February KP meeting was not quite so well attended as usual, but made up in quality, so to speak, what it lacked in quantity. Your correspondent was not able to stay for the party, which was to take place at the conclusion, but from the appearance and shape of sundry brown paper parcels scattered here and there, and noticeably parched looks on the faces of the boys, all should have been very well.

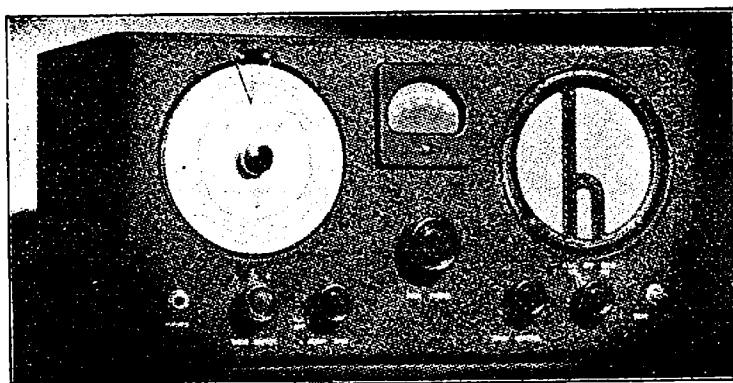
That old bone of contention, Fone versus CW, was once again dragged out of its dustbin, and whatever meat still remains on it was attacked voraciously. This annual feast is one occasion when the severest critic could not accuse the section of apathy, and if for no other reason, this alone should make it worth while. Your correspondent's own

views on the subject are too well known to bear repetition here, but he feels some satisfaction in that the general tone of the meeting was definitely in favour of some more stringent form of control of fone stations than was the case in last year's celebrated brawl.

Before getting off the subject, and altogether apart from the Fone QRM angle, why is it that not more than about fifty per cent. of fone stations use decent English. You don't have to take a course in elocution, although that certainly is an idea, but why, for instance, this "handle" business. Mugs have handles, and so have other domestic utensils which are very useful in their right places, but why, when you want to know a fellow's Christian name, ask for his "handle." Admittedly, Amateur Radio has developed a language to some extent its own, and made necessary in order to simplify and speed up CW operation, but the language is not adaptable to fone, as evidenced by the futility of "Hi-hi-

ing" into the microphone instead of laughing or chuckling normally. As for "handle," this type of slang is inexcusable on any grounds.

Having cleared the decks of that, let's see what the boys are doing. To the dissatisfaction of the local sparrows, who thought they were on a good thing, HK has shortened slightly the reflector and director of the 28 mc three element rotary beam, and it is now doing its stuff properly. The signals from the back are way down, and DX no trouble. An H type array on 56 mc is being used by JE, who hopes to QSO Melbourne direct. Between periods of chasing the elusive DX on 14 mc, CO is also on 56 mc, and is building a super for this band. BQ is still making little ones out of big ones with his crystal saw, and was using Q bars on two half waves in phase for testing his finished products until the Q bars come adrift. He is now trying out a Y match when QRM permits. ZU is getting down on 28 mc,



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and IG has his receiver working on that band.

At the KP meeting UK and UM both gave very interesting talks on their experiences during the bush fires. Members of the gang who put up such a fine show on that weekend have all recovered from their trips, and have been busy getting bugs, ashes, and what not out of their gear. To make matters worse, one of the boys has just received an account from a local garage for 10/- for hire of a storage battery, which he borrowed for the occasion, and in view of the circumstances, that particular garage's petrol sales seem due for a decided falling off.

Suddenly smitten with the futility of it all, EB has abandoned radio in favour of building motor boats. Those familiar sounds which emanate from bad amplifiers will in the future be music to his ears! Having taken out provisional patents on his "kitchen stove" receiver, which is working well, IW was moved to listen to 7 mc, but even this receiver will not work miracles—so back to 14 mc again.

The light on QV's antenna is troubling people who call in from time to time to inquire if the house is on fire. Whether this is what attracted 5XA who called on him when passing through Melbourne, is not known. Another one having trouble with lights is WU, who has been using the plate of his 809 to illuminate the shack.

Both QS and SQ are busy rebuilding, and QW is having trouble with his super, which seems infested with all those insects with which Providence has endowed supers in general. DP has his new rig working well, and his super-gainer is once more behaving as it should. IK is on phone, adding to the din on 7 mc, and threatens 14 mc in the near future.

This month's bunch of orchids goes to CX, who rang your correspondent, and informed him that he enjoyed reading the Key Section Notes. My public now numbers two!

## WESTERN ZONE. (VK3HG.)

A Sunday morning hook-up of stations in the zone is at last under way, with five stations so far taking part. But more are needed to keep it going satisfactorily, so join in

boys, and listen for the general CQ at 10 a.m. on 7 mc.

3TW.—"The busiest man in Australia." Has little time for radio and has passed the writing of these notes back to the original scribe.

3SZ.—Put the rig on 14 mc and got a taste of DX with a PK.

3XG.—Welcome to the zone hook-up, Ben. Getting some nice DX on 14 mc and wants Africa for the usual reason.

3WT.—Heard regularly on 7 mc phone.

3BU.—Also on 7 mc phone, but not so regularly.

3JA.—Still impatiently awaiting the return of his genemotor. Not on very much.

3KX.—Very consistent with the Europeans and North Africans.

3GQ and 3PE.—Did their bit in the recent bush fire traffic.

3AG.—Has left the zone for parts unknown.

3OW.—More interested in being in the air than on the air. Will soon qualify for his flying ticket.

3HG.—Getting a new country or two and nearing the century. Will shortly have elaborate V beam antennas erected on nearby hill.

## U.H.F. SECTION NOTES.

(By 3JO)

Next Meeting: Tuesday, March 21st.  
Field Day.

The results of the field day held on Sunday, February 26th, are not yet to hand, but it is interesting to recall the intended arrangements and locations used. Stations other than those recorded last month are:—3KQ Mt. Dandenong, 3QR Mt. Macedon 3UK Cape Schank, and 3RI on a boat in Port Phillip Bay. No notification was received from country stations of their intended activities. Details of schedules were as follows: 1100 to 1115, all VK3 stations to call VK7; 1113 to 1130, all VK3 stations to listen for VK7. It was felt that the higher powered c.c. stations in the city would have a much better chance of pushing a signal across to VK7 than the portable stations, while the latter, with more favorable receiving conditions, would be in a better position than the city stations to receive signals from VK7. It was therefore decided to arrange a quick check with both city and portable stations. To expedite this check, the

various stations were numbered 1, 2, 3, 4, and so on, the stations to come on in their proper order until reports had been received from all. In this way, it was hoped that all reports would be collected within 5 or 10 minutes, leaving the rest of the hour for contests between ourselves. This programme to be repeated every hour till 1700.

The results are now past history, and we hope to be able to record some very interesting reports in these notes next month. All stations participating are once again requested to forward a copy of their logs and activities to the secretary of this section prior to March 18th.

New call signs heard on 56 mc. during the month are 3CO, 3SG and 3KT. 3CO was using PP 210's, strength 718 here. 3SG used a 3 stage c.c. rig with 807 doubler as final stage with cathode modulation, R8 signal, though quality of speech rather poor. 3KT was operating the portable gear used by 3QR on the field day, and uses 41 triode osc. 42 mod., signal strength about R5. Other stations worked during the month—VK3YL, OT, XM, QR, HP, NB, RI and PS.

## Queensland Division

At the February meeting a very interesting lecture ably given by Harry Bremerman, 4HB, on the present standard of television in England, was presented to a fair gathering of members, who exhibited amazement at the advances made in this particular sphere, and many eyes gleamed when the system of

ultra short wave relaying for outside scenes, was described. The vans used for this particular work are fitted up most elaborately and the transmitter power is in kilowatts. Harry has just returned from a trip to England, where he lost no time in unearthing all the dope on television and passing the boys the "low down" on his arrival back.

We also had the pleasure of meeting and entertaining an old radio friend in the person of Mr. G. H. Grey, ZS1CU, old call ZT1A, who is tripping round the globe as radio operator. He was able to give us very interesting information in regard to conditions and hams generally in South Africa and places where he had called during his travels.

We would like to express our appreciation of the splendid work performed by those members during the recent bush fires in the southern state, the divisions concerned and members themselves. A splendid service to both the community and Amateur Radio.

The annual general meeting is to take place at 7.30 p.m. Friday, 31st March; location, Atcherley House, Petrie Bight, Brisbane. It will, as usual, take the form of a dinner and ham fest and we expect a record attendance. Subscription, 5/-. The trophies for the following awards will be presented:—W.I.A. Trophy, for outstanding performance during the year; Council Trophy, for best piece of home made apparatus; Cran Trophy, best score during the contests of the year; Mackenzie Gold Trophy, for best Station. Entries are to reach the secretary, Box 1524V, G.P.O., Brisbane, before 15th March. Now make the competition strong and the



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4SD.—Back on the air again after a trip to N.Q.

4WT.—Has temporarily shifted his QRA to Red Hill and now has a TRF receiver recently acquired from 4RY.

4PX.—Building up a modulator with 6L6Gs and a DB mike.

4HU.—Shifted QRA and now is interested in the radio service racket.

4JP.—On 20 metre fone again after holidays and strenuous efforts swinging a club at the royal and ancient game.

4GU.—Selling out, but we find he is still on the air with QRP and TC 04/10.

4UU.—The surprise of the year. After a number of years off the air, Bill Chitham, treasurer of this division, has staged a comeback from a new location. Bill has landed in a nest of car ignition and power leaks. Maybe he will return to the old QRA.

4AN.—Off to Point Cook. Likewise 4RH to take up R.A.A.F. training.

4SA.—Knocked up a good score in the BERU, but with a T3 note most time. Sounds much better when you use that crystal, OM.

4VJ.—Has a framework built for a rotary beam and has designs for self-supporting elements using telescopic tubing.

4MD.—Bob McDermott, of Nambour, is the latest addition to the McDermott "radio" family, which is now broth. 4JM and "pop" 4WP.

4BB.—Was on during the BERU with his usual high score, visited the gang during his holidays in VIB.

4HR.—Rebuilding the transmitter rack and panel and shifting QRA to a very fb 5 metre location and particularly noise free area. How we envy that more.

4KH.—Yes, Bill is building yet another super on copper entirely and not dismantling the one used at present. What type of injection this one, Bill?

4HB.—Just back from England, where he followed up the latest methods of television and gliding activities.

4UR.—taken a course of elbow bending.

4UL.—Bad attack of YL-itis. along with 4UR took swag of port-

able gear to Bowen for holidays, but did not even open the gear up. According to 4UL QRM from YL's too bad, or is it too good?

4XO.—Mark is studying for commercial ticket in between 40 mx. QSO's, and when he is not operating at the talkies.

4DU.—Back at Kingaroy after a recent trip to NQ. Has 76 CO and 6V6G in the PA.

4HP.—is a new ham at Bundaberg, using 6V6G EC and 2 6V6Gs parallel.

4OK.—Returned home after being at "Bundy" for crushing season and is getting out with 4 watts. Has a 2nd operator on the job.

4KK.—Studying for commercial, will be visiting hams on an Easter trip to N.Q.

4JJ.—Just been presented with a junior op. Congrats. Says he will be back on if he can find a duster.

4KC from Port Moresby at present holidaying in Sydney.

4SR.—Tom is up in Cairns, N.Q., selling furniture.

4ES.—in Brisbane on the police force. Checks over car radios and what not in the radio system.

4RY.—Just landed VU7BR for his 92nd country. Won't be long now, Bill. Starting to get tougher.

4CG.—Has 56 mc transmitter on nightly from 8 p.m. with beam directed south, from Toowoomba, so if any of you boys happen to hear, say, Bing Crosby crooning on 56 mc, you may guess its Cliff 4CG's outfit from the Empire Theatre.

4JX.—Not heard of. Still getting over the VK/ZL.

4GA.—The man from the far north west. Flew down from Quamby to VIB, says its the only way to travel. Been doing good R.A.A.F. WR work in the N. West in connection with survey flights.

### South Australian Division

(By VK5KL.)

After the terrific bush fires had illustrated that emergency equipment is a necessity in every ham's shack and to be able to get it going at a moment's notice, it was decided to organise the whole scheme on a workable basis. Four sections have been organised consisting of North, South, East and West, each with a

# Amateur Radio

leader, who is to keep a log of all his members, including full details of business address, phone number, details of rig, receiver, xtals, etc. Section leaders are as follow:— North, C. H. Castle, VK5KL; South, R. Pearce, VK5RK; East, F. Holsten, VK5LK; West, W. Lloyd, VK5HD. With all this in order a call for emergency equipment will see the boys in action within a very short time. Tests are to be arranged as practice.

On 1st March Mr. Frank Holsten will show the movie films taken at Echunga amongst the bush fires and this should prove a novel night. A good attendance is expected. Other films will make up the full evening. Two visits have been arranged to the G.P.O.; these necessitate limiting the members attending to 15. Please inform the secretary if you wish to go.

All will be interested to know that Eric Trebilcock of BRS 195 fame, and who is situated at Powell Creek, N.T., has obtained a temporary licence and so will be heard on the air. Eric will most likely use 20 mx, so keep a look out for him. No call officially announced yet. Congrats Eric, but don't worry us with QTR.

Conditions on 20 here seen fair, Asiatic stations being well to the foreground, but Yanks being conspicuous by their absence. Forty metres will yield some nice contacts for those who wish to try FA8BG and a few Gs audible around 6.30 a.m. 10 is not too good, but 80 mx is popular for Sunday night talks.

We all will be pleased to know that Malcolm Gray, 5SU, has gone to Suva for a few years with Government work. May hear him with a new call from there.

## GREY ZONE. (VK5LC.)

I do not know if conditions have changed of late, but previous to going to 5RE's a week ago conditions were bad on 40 and 20, and only arrived home yesterday after a very pleasant trip, so haven't had much time to listen.

5HR back in the game in great style with a new power pack delivering 20 watts CW and 12 watts on phone; also bought a car so things are looking up. How do you do it, Bill? Thanks for the notes.

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## Amateur Radio

5RJ.—After years of facing a mike, Darce is going to stage a comeback to CW; it is said that the key is all polished and ready for action. DX bug biting Darce? Building a new rig too, complete with all gadgets for 100 per cent. CW vacuum tube keying.

5KJ.—George informs me that he will be on again about the end of February with 30 watt power supply and 6L6G-6L6G rig, and he is inquiring about Vee Beams, 82 long on 80 and 40. Say George, is this game wireless? He is on the air from 8VK. Thanks for the notes.

5YM.—Norm. active with E.C. rig on CW and I was copying him quite good strength at Renmark, although he has a poor radiator which is badly shielded with trees. He had lot of trouble trying to keep my sked with 5RE and I think he called my rx a few names.

5WG.—Wally still inactive as far as I know; hear 5JT calling him for reserve work, but no reply.

5NW.—Bob should be on weekends, but as I have been away, haven't heard him.

5WJ.—What's the matter with you Bill? Haven't heard you on for months. Don't you get "A.R."?

5BK.—The above applies to you, Jack, except that you are a member; but I am not sure of Bill.

5MP.—What's the latest, Len? Still experimenting with 5 mx?

5TL.—Have you that fone going Tom? Haven't hear you, but here's hoping.

5LG.—Had to open envelope to include your notes, Leith. So you built a gainer that wouldn't super and you have had to rebuild T.R.F. again.

5LC.—Been away for two weekends, but previously tried 20 mx, and over a period of week only had one QSO, ZL-R8 and that was in the middle of day. Conditions on 20 mx DX seem to be down a lot on last year.

Have only had three letters this month, from 5KJ, 5HR and 5LG (Leith's arrived only in the nick of time). Say chaps, let's have notes from you on your activities (if any), also your intentions, because these notes are month old when you read them.

### BARKER ZONE.

..... (By VK5GW.) .....

Notes for this zone are scarce this

month. Condx at Narracoorte have been and still are very bad. There has not been a sig. heard from any of the Barker gang, although 5GW and 5XR have been listening on the BERU contest for a week.

VK5 sigs (CW) are very seldom heard here, and the absence of VK5 phone has been very noticeable. 5BF and 5BG have not been heard here for some time.

5XR working on mx phone with a few good contacts; Bert so far is R9 from KA7.

5TW.—Now has xtal on low freq. end of 7mc band, about 7005 kc, 2 stage xtal rig, with phone later.

5BN.—Giving up 43s in favour of 48s in PP parallel on phone. Not doing much radio in summer; gaining reputation as wet weather operator.

5CJ.—Consistent R7-R9 repts on fone from interstate 25 watts to 807. Has rebuilt 5 mx rig on aluminium chassis.

5PB.—Rather interested again. been assisting 5GW erecting antennas.

5GW.—Trying to beat Narracoorte conditions with the antenna system. No luck so far. Has tried zepp, centre fed zepp, single wire matched imp., doublets and 8JK beam. Best results so far have been VK4 on 20 mx and PK7 on 40 mx.

Well chaps lets have something for next time.

## Western Australian Division

(General meeting held every month on second Tuesday at 8 p.m. in Division headquarters, Room 2, Melba Chambers, corner Hay and Milligan streets, Perth.)

VK6 was not to be left free from disaster as many of us thought at first. While bush fires and heat waves raged in Eastern Australia, Port Hedland on the north-west coast was hit by a cyclone which destroyed all communications and did enormous damage. The first intimation of what was going on up there came from a message from the A.A.M.S. base station which suffered damage to its aerial system by high wind and damage to its gear by sea watter. "Port Hedland completely surround-

## Amateur Radio

ed by sea and many houses washed away" was the brief message sent out. A pedal-set operator fortunately heard the transmission and QSP to another who in turn passed it on to Perth. In the long story of the disaster two facts stand out, the first that operator John Richards (VK6JR), relieving 6FH as "Flying Doctor" base operator at Hedland, did sterling service in restoring communication, and the second, that radio was invaluable. Surely these facts and the striking examples witnessed in Victoria and South Australia will awaken all concerned to the need for an organised amateur emergency net. The good work done by (strictly speaking) unorganised amateur radio could be increased in value a hundredfold by organisation and official sanction in advance of future possible disasters.

Reverting to less serious matters, conditions in W.A. have been f.a.q. lately with nothing really startling happening in the DX world. 7 mc gets terrifically noisy at times and even 14 mc has its moments of QRN level. Of 28 mc little is known; the writer has not been listening there and all others questioned either say the same or tell of fruitless listening.

In the Winchell Way—

6SA received quietly sarcastic razz from several stations on 7 mc the other day when he astonished Messrs. Heaviside and Appleton by putting on fone! Both layers doing as well as can be expected; no callers (on fone) for fourteen days.

6AG back from gallivanting in Eastern States—cheery voice heard over 6SA on aforementioned historic occasion.

6BB still persevering with 56 mc skeds—has exotic taste in highbrow music and says that this enables listeners to identify 6BB from ordinary hams (!!!)—boy! bring more Beethoven!

6MW back from holidays and back on ether—renewing old W friendships.

6MN comes on 7 mc with one of those rare 100 per cent. T9x, non-clicking, gold-filled signals and tries, vainly, to separate code signals from a local SWL-serenader—said serenader may be heard on 40 and 20 mx simultaneously in most parts of

metropolitan area—sometimes he calls "CQ forty" and sometimes "CQ twenty"—does it matter?

6EC at last active in Nedlands on 7 and 14 mc—hope he has all the answers ready when the DX fone men tell him his xtal doubles into the Yank fone band—and why not?—it's all part of the band.

6FL down in Perth for Country Week Cricket and renewing old friendships and meeting others in the flesh for first time—should relish prospect of a little work as relaxation after it's all over.

6JC now headmistress of large college at (no foolin') Charlie's Creek (via Donnybrook)—expects to be on the air soon—QRP on batteries—says she has found creek but Chas. nowhere to be seen.

6MY will be in the thick of new classes at W.I.A. by time these lines appear—still threatening to come back on air one of these days—whereas—

6JS actually HAS fulfilled a similar promise.

6LJ not heard much these days—had taste of Senior BERU and gave it best.

6KW still rolling 'em in on 14 mc—been entertaining visitors in the shape of 6TX and 6FL.

6RL after all these years—when heard recently said to be working portable—where, Ralph? Valhalla?

6FO reported to be preparing for comeback.

VK6WZ.

## Tasmanian Division

(By 7YL.)

The monthly meeting of this division was held in the Y.M.C.A. rooms on Tuesday, 14th. The northern zone held their meeting on the first Thursday of the month and to the inward correspondence from the North arrived in good time for meeting here. Will Southern members of the Institute please note that meetings are held on every second Tuesday of each month.

Owing to the unavoidable absence of the assistant secretary the task of recording the minutes fell on the shoulders of 7AL, who was able to keep up with the fast and furious discussions that took place ("furious" refers only to the rapidity of

## Amateur Radio

the conversation and not to the tempers of the participants of the aforesaid discussion).

Several suggestions made by members of the Northern Zone were adopted and after various business matters had been completed, a very interesting lecture was given by Mr. Chas. Miller (7CM) on the subject of "Beam Antennae." The lecture proved most helpful and many of those present, I am sure, resolved to try out the various "beams" when time and cash permitted.

It was decided to send the secretary (Mr. H. Moorehouse) to the forthcoming convention in VK3 as the Tasmanian delegate. "Chummy" has been in the Tasmanian division of the Institute for ages and has its affairs at his fingertips.

It was decided by the council that in the future non-members would have to send a stamped addressed envelope to obtain their QSL cards. No cards could be personally given or delivered by the QSL manager. Town members may obtain their cards only by attending the monthly meetings, where in the future they would be distributed.

7CM.—Charlie has just completed his studies at College. He headed the list of "Leaving Certificate" candidates with just the bare eight credits(!) and is now taking an Engineering course at the University. Despite this finds plenty of time to work DX. Has an W8TK beam. Finds that signals are at least 2R's louder when using it.

7CT.—Terry is thinking of buying another generator to supply his voltage as he has an FB transmitter and no juice to make it go. Has been waiting for the A.C. mains to go through Rokeby, but they just haven't.

7KV.—Is still in the land of living. Heard on 20 mx now and again working good spots of DX.

7PA.—On shift work at present and has to get beauty sleep during day so unable to go along to meetings.

7DH, who is on the staff of one of the local broadcasting stations, is another who just can't get along to the W.I.A. room on Tuesdays.

7JB.—At present "baking" in VK2 and according to reports is about as sunburned as a "darkie." Hopes to be back in VK7 some time in May. Buck has managed to visit

a few Sydney hams, but hasn't much time, being very busy.

7YL.—Finding dx most patchy. Heard TI5JJ on fone R8 solid last Saturday and next night could barely hear Yanks.

### NORTHERN ZONE NOTES.

(By VK7LZ.)

Since last month's notes were published the Amateurs in Launceston have reformed the Northern Zone, which in future we hope to make practically self supporting.

At this early date I cannot give all details, as we are waiting on a reply from headquarters in Hobart.

Officers elected at the meeting were:—Mr. Jebb (chairman), Mr. C. Robinson (VK7KR), secretary; Mr. C. Wright, QSL manager. If any of the proposed Northern Zone "Country" members have any ideas or suggestions both for, or against, this scheme the secretary would be pleased to receive same. Address all letters to Mr. C. Robinson, 8 Howick street, Launceston.

It will be pleasing to everyone to know that the North and South have mutually overcome all difficulties and that both are working to make the W.I.A. stronger in Tasmania than ever before.

Before concluding, I would like to ask Federal Headquarters to give the Tasmanian Division their full support as in the past we have only heard of contests after they are over or nearly so and other correspondence as far as I can gather is sometimes very very late.

DX is very poor here at present and therefore the activities of most are practically nil, although it was very pleasing to hear 7RK staging a comeback a few evenings ago.

Anyone wanting French India as another country should keep a lookout on 14210 kcs for FN1C, his signals come in rather good down here and he uses both phone and CW.

Owing to the fact that no one knew the rules for the BERU contest the Northern Zone was not represented this year.

This month advantage has been taken of space allowed the zone in this publication to acquaint other zone members of just what the amateurs in Launceston are doing towards getting organised, so space does not permit us to give the personal doings of members; however,

this will be remedied in the next issue.

Nothing is heard of the coastal amateurs here in Launceston and I cannot write notes about their doings, so what say, chaps. Drop me a line someone.

Also all members take note.—The next zone meeting is to be held in the Launceston Y.M.C.A. at 8 p.m. on 30th March and we want a record muster.

---

### New Guinea Notes

9GW.—George has built a new rig using 6L6s and getting good results. What about some dx notes George. That R9 report from W sounds as if some good dx is in the offing. Come up and join the Rag-Chewers' Club on 40 and tell us all about it om.

9XX.—Where's those notes, Basil om? I hv an idea you hv some vy nice dx up the sleeve over there so what! The 40 meter R.C.C. is in full swing every afternoon om and some fb wrk is done there oc so come on in.

9DK.—Ernie has a 6P6 osc es a 6L6 final 2 watts in all and does some good wrk. Heard your wrkng PK6XX the other nite oc hi! Ernie tells me if no one comes back to his cq he pulls the big switch es listens to B.C. till condx improve. At present talking darkly of a new rig with an 809 final es directive ants. Don't pull the 6P6 "lik-lik" down tho oc!

9WL.—At present Laurie is in a spot of bother. His converter went on the ice and then the rig developed trouble. Last time hrd on the air was hrd to be muttering about taking to raising chickens or home brew. When the converter went phut he was forced to use batteries es low pwr abt 6 watts es was looking forward to the time when the rig would be on full pwr agn hi! 10 watts.

9MC.—Uses abt 4t watts out of genemotor es batteries. Bill is a prospector and tells me he can't find a good spot. The ideal seems to be a place with a few high trees and a

good bit of gold mixed with the earth. When you find that possey Bill peg me out a QTH too. His main trouble at the moment seems to be antenna, but the last few times hv been much better om.

9BW.—Some of that dx would be very acceptable Bill for the notes and what about it. 44 countries es about 24 zones about three weeks ago. How many more now om? We are going to lose Bill soon as he is going South due to illness of the xyl.

9RC.—Don't know much abt you Ron oc, but next time we will get some news off you. Let's hr from you oc.

9DM.—Staged a comeback after a long absence, talking darkly of a new rig in the offing. Good to hr you on the air again Dudley and hpe the new rig comes to light soon, but what's wrong with the old one? Let us hr more about the new doings om.

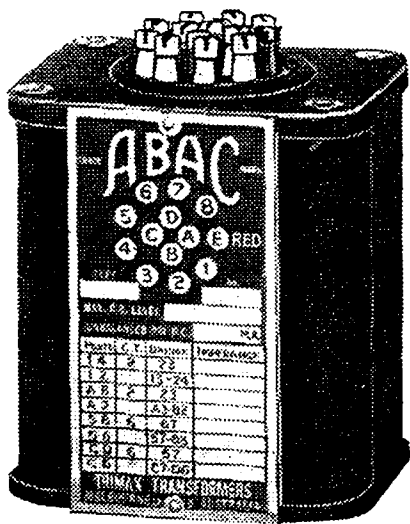
9RM.—The latest VK9 and he will be on the air before these notes are printed. The rig is going to be xtal osc and a 6L6 amp on cw only for a start. Good luck Peter and let us know how the dx comes in. The QSL crd is going to be a real New Guinea one and vy fb too. Peter tells me the operating times will be from 6 p.m. till 6 a.m. solid.

9VG.—Not doing much at present. Wrkd a few Sth Americans, TG9BA, KF6DHW es others. The new NC101X is in Port Moresby and VG is rapidly becoming public enemy no. 1 at Guinean Airways office (its getting so that they are not answering the telephone to Bulolo calls). All the antennas are in the course of being overhauled ready for a big dx season on the arrival of the new rx.

And this month's short story begins, "There was once a VK9 ham who did not get a single SWL card in his mail."

This is the first notes sent down from New Guinea and I would like all you VK9 hams to rally round and send in some notes on ur doings dx and rigs, etc. Tell em to me via the 40 mc. rag chews and I will make a note of them.

VK9VG.



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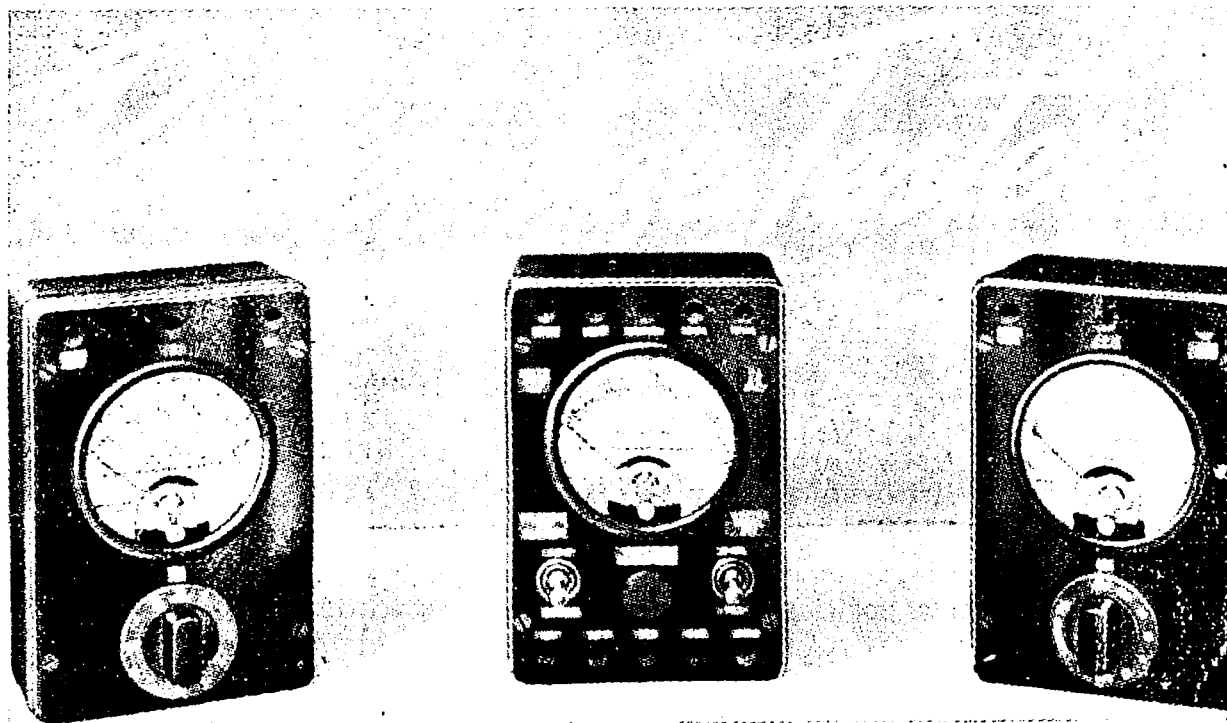
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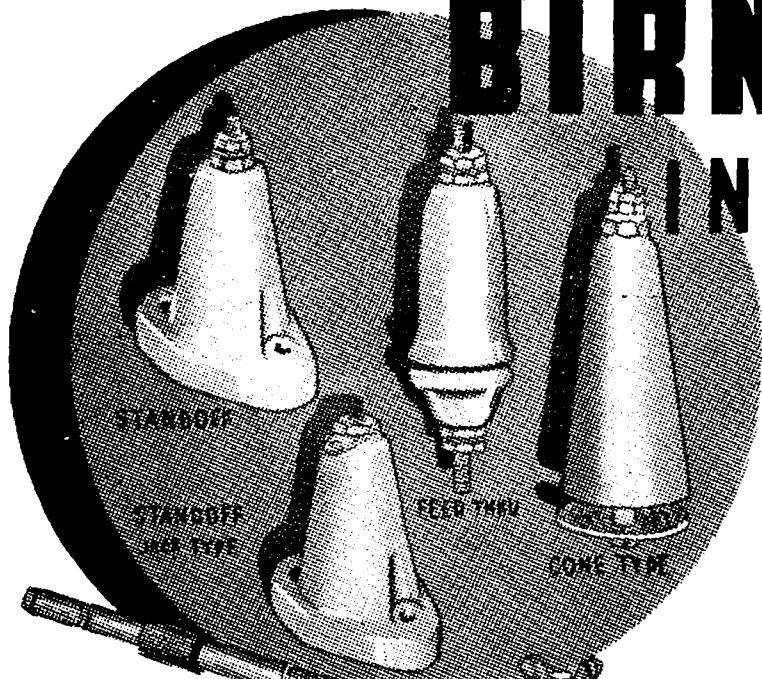


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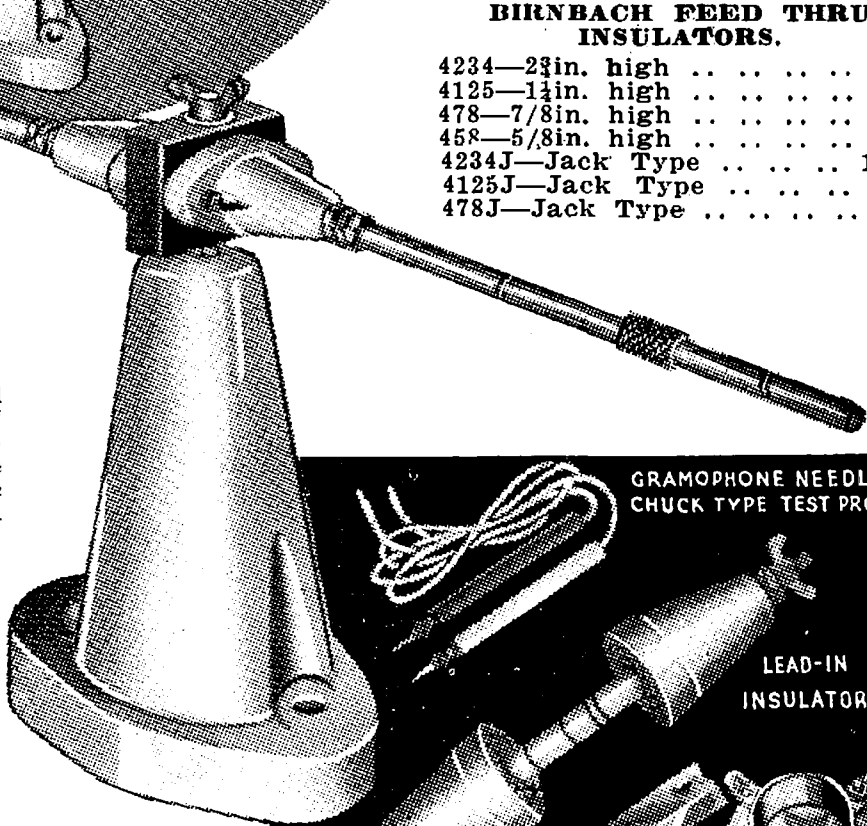
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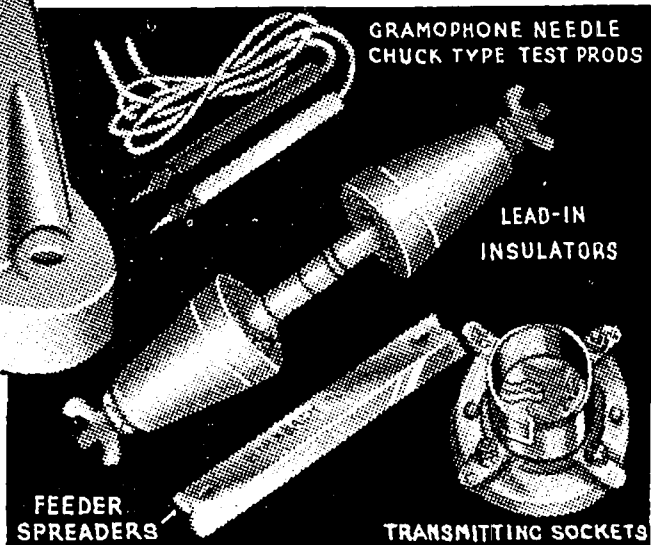
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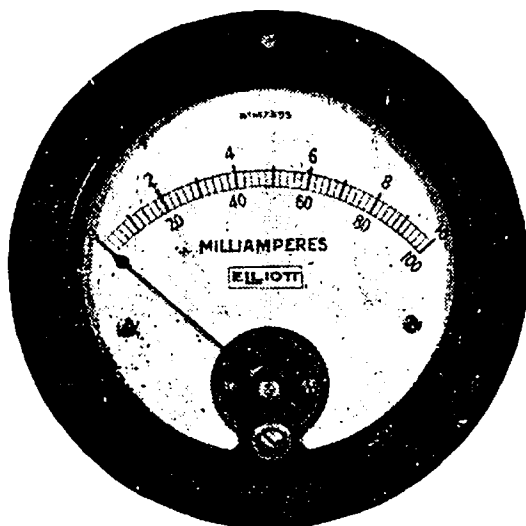
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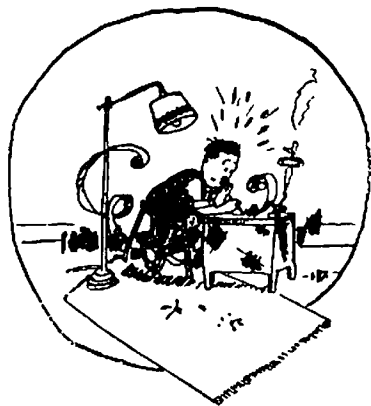
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# EDITORIAL

The Editorial of QST for February gives one food for serious thought. Every ham, no matter how dumb, knows the fact that a radio transmitter is a potential lethal machine, yet hardly one of us has not at some time put our hands into the "vitals" with the power turned on. Many of us have boasted of having received "so many hundred volts shock," we have all laughed at the "wisecrack" of measuring high voltage on the basis of a hundred volts for every foot the jolt throws you. It is all very funny until something serious happens and the thing that really gets under the skin in the case cited in QST is that the power pack that killed W9VYU was not the big high voltage pack, but merely the speech amplifier supply. Many who read and grieved over the tragic news of the loss of Ross Hull felt, "of course he hadn't a chance, it was a high voltage pack, thousands of volts"; true, but this case is one where a combination of circumstances likely to be met in any ham's activity caused death from 500 volts.

Some of the power supply arrangements in our transmitters are excellent, some are fair and some are frankly courting disaster. Admittedly we are not permitted to use sufficiently high power to require power supplies running to outputs of thousands of volts, but few of us indeed do not possess a 500 volt supply. If, on reading of that tragedy mentioned, you did not go out to the shack and look your own transmitter over to see what its safety possibilities or otherwise were, we suggest you do so now and take with you, as we have done, that phrase from QST, "Get safety conscious, ALWAYS BE CAREFUL."

## FEDERAL CONVENTION.

Melbourne will be the venue of a large number of Hams at Easter, for the Federal Convention which will be held over the holiday period will be the excuse, if one were needed, for a first class "Hamfest." On Easter Saturday night the Victorian Division will hold its annual dinner at which the guests will include Mr. Malone, the Chief Inspector of Wireless, and other members of the Radio Inspectors' Department, as well as the delegates from the various divisions. If you have not already made arrangements to spend your holidays in Melbourne this Eastertide, we suggest you can certainly be promised a right royal time if you can possibly make the trip.

## R.A.A.F. RESERVE W/T SEC.

We understand that enrolments in the reorganised R.A.A.F. Wireless Reserve are pouring in from all over the country. If you have not sent in your application and are desirous of joining, do not delay or you may be too late. As we mentioned in this column last month, membership in the Wireless Reserve offers a wonderful opportunity for Amateurs who are not already serving in another branch of the Forces to join a unit composed solely of radio amateurs. In brief, the qualifications are physical fitness, enthusiasm and a reasonably high standard of operating ability.

## A Flexible and Stable E.C.—C.C. Oscillator

(By W. T. S. Mitchell, VK3UM.)

is towards crystal control, a stable electron-coupled oscillator is a worthy addition to the crystal control.

The oscillator to be described is a combined E.C. and C.C. oscillator using a type 6V6G beam tetrode, the change-over from one to the other being accomplished by a single D.P.D.T. switch. The average ham cannot afford enough crystals to cover the entire band, but he can do this by incorporating an E.C. oscillator which is, without a doubt, a very useful adjunct, especially in hopping a few kcs to avoid QRM and finish a QSO which otherwise would have been lost.

### Operation.

In the C.C. position of SW1, and SW3 open, the 6V6G operates in a tritet circuit, and 80 and 40 metre crystals can be used with perfect safety providing the pointers listed later are observed. By now closing SW3 (which may be a bent-over rotor plate on C1), the 6V6G becomes a straight pentode oscillator. The coil L1 is used for both tritet and E.C. operation. L2 may be of such inductance in conjunction with C2, to cover any two bands, i.e., 80 and 40 or 40 and 20.

Using an 80 mx crystal, the oscillator gives excellent output on 80

or 40 and reduced output quadrupling to 20. With a 40 m crystal, good output on 40 and 20, and sufficient output on 10m to drive another beam tube. In the E.C. position, the cathode is at approximately 65m and the plate at 40 m. By winding L1 to tune to approx. 20 and L2 at 10 m or 10 and 5, good output should be obtainable. Refer to article by VK2NO in February, 1937, Amateur Radio, page 8.

All values of resistances, condensers, etc., are as shown and these values should be followed closely. Coils L1 must be wound to exact specifications or trouble may be experienced with instability. A word about wire for coils—don't use tinned wire. The surface resistance of tinned wire is very high and R.F. losses are high. This was noticed in the writer's own rig, where the only alteration was the replacing of tinned wire by enamelled wire, and the wattage increased by 1 watt.

One cannot overstress the importance of good quality parts in a transmitter, and in this oscillator, especially for good stability, they are desirable.

The following pointers should be adhered to if building this unit:—

(1) A well regulated power supply with choke input is the nucleus of

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the oscillator's stability. (2) For 6V6G keep the screen voltage at 150 or below and the plate voltage at 300 or below. (3) Use heavy gauge wire for all wiring, i.e., 14 or 16 gauge bare or enamelled. (4) Ground all earth returns, bypasses, etc., to a common point on the chassis. (5) Use a precision vernier dial on the cathode condenser C1. (6) Do not use E.C. on fundamental. Always double for greatest stability. Don't use tritet on fundamental. (7) Calibrate your vernier dial from a reliable source to simplify setting E.C.O. in

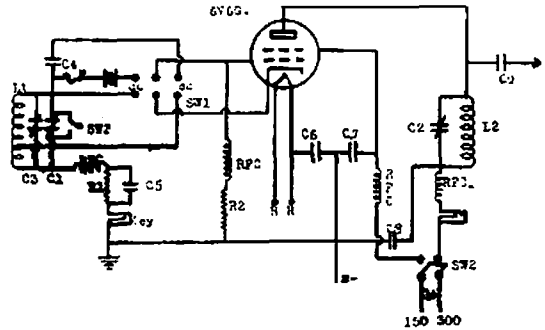
Although to-day the general trend the band. (8) Don't swish your E.C.O. across the band. Set it before you turn on the H.T. (9) Use an aluminium plate condenser C1 to avoid frequency drift.

### Tuning.

Although tuning of tritet oscillators is found in most text books, a refresher would not go amiss. To tune the tritet oscillator with H.T. on, the cathode condenser C1 is decreased in capacity until a dip occurs in plate current. C2 is tuned to resonance, and then C1 is decreased still more to a point where the grid drive begins to fall. At this point the output is greater and the crystal current less. With a 100 ma. pea lamp at F, the crystal current is not sufficient to make the pea lamp glow even with a 40 m crystal.

Tuning the E.C.O. is similar to the tritet, but wherever the setting of C1, oscillation occurs. Tune C2 to resonance for max. grid drive. The plate condenser C2 is not very critical as regards frequency, and a shift of 10 to 15 kc may be made either way with C1 without resetting C2. If the E.C.O. is calibrated with the crystal in its socket, a slight change of frequency will occur with the crystal out.

The above oscillator has been in use at this station for over six months and in that time over 500 QSO's have only shown an occasional report less than T9X! Furthermore, this oscillator, E.C. and C.C., has always been keyed with a bug at J1, without chirps or bloops, and makes breakin operation and general DX work a real pleasure.



### Parts.

- C1, 2—100 mmfrd variable isolantite condensers.
- C3.—.00025 mmfd mica fixed.
- C4, 9.—.0001 mfd mica fixed.
- C5, 6, 7, 8.—.01 mfd mica fixed.
- R1.—400 W.W.resistor.
- R2.—100000 carbon resistor.
- RFC.—2.5mh R.F. chokes.
- J1, 2.—Closed circuit jacks.
- SW1.—D.P.P.T. toggle switch.
- SW2.—D.P.S.T. toggle switch.
- SW3.—See text.
- F.—100 ma. pea lamp and holder.
- L2.—See text (inductance between 30 mh. and 14 mh. for 80 and 40 m.)
- L1.—80 m 11.5 turns, 2.1 turns cath. tap, .75" winding space, 20 g. enam. 40 m. 5.5 turns, 1.1 turns cath tap, .75" winding space, 20 g. enam.

All coil formers 1½ in. diameter ribbed.

Note.—Screen voltage should be taken from bleeder in power supply.

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## Cathode Modulation

(By J. B. Hourigan, VK3SG.)

This article is a description of what appears to be, so far as I know, a novel system of modulation. It is definitely a form of grid modulation, but grid modulation without most of the snags that grid modulation seems to possess, plus an efficiency that as regards the 807 particularly, is as high as plate modulation.

It may be of interest to give a brief outline of how I came to evolve the scheme, because up to the time I used it, I had never heard of anyone using it, and only since then have I been told that it has been used on modulated oscillators of low power on 5 metres. In the course of trying to get grid modulation working stably I had tried various systems, principally the idea where self bias is used in the cathode of the modulated amplifier to keep the grid constantly negative, with a consequent increase of efficiency. After much hard thinking it occurred to me, why not put the modulation transformer in the cathode circuit and use the audio voltage developed across the secondary of the transformer as the necessary bias to maintain stable operations. My idea was to try and get the operation condition of the stage up to or near class C. Well, my expectations were more than realised. At that time I was using a pair of 45's in push pull in the final; under straight grid modulation 2 mills of grid current was all that I could use. With cathode modulation that figure went up to nearer 8 mills with a resultant big increase in output. In the rig to be described I am not using the 45's in the final, but a single 807. I hope at a later date to be able to give details of operating conditions of other types of tubes such as an 809 and possibly a tube with a low amplification factor. However, since it works on a low mu triode, and a high mu penthode, it will probably be just as efficient with any tube. However, that remains to be seen.

It will be seen that the 807 stage is quite straightforward with the exception that it is neutralised. However, as the tube is one of the older type, and also the layout of the stage is not the best, this was done to be on the safe side.

The only really critical point about the whole scheme is the modulation transformer, the secondary impedance of which is very low, in the region of 450 to 500 ohms. One suggestion for a transformer for anyone who cares to try the idea out experimentally is to use a power transformer. The whole of the secondary winding is used as the primary, and the primary winding is used as secondary. This works out well where a 45 tube is used as a modulator, but if a 2A5 is used the modulator output is not the best, and a falling off in quality is apparent.

It will be seen that 50 volts of fixed bias is used. This again is not very critical, and may be subject to some adjustment by individual users. The only point to watch out for is to see that the tube is not overdriven. The 807 is extremely easy to overdrive, and the rated grid current should not be exceeded. Overdrive evidences itself by giving downward modulation. One point I have noticed in the operation of the stage is an apparent contradiction. This is upward modulation of the antenna current and a slight downward kick of the plate meter. This only happens when the stage is adjusted right up to a maximum and has no

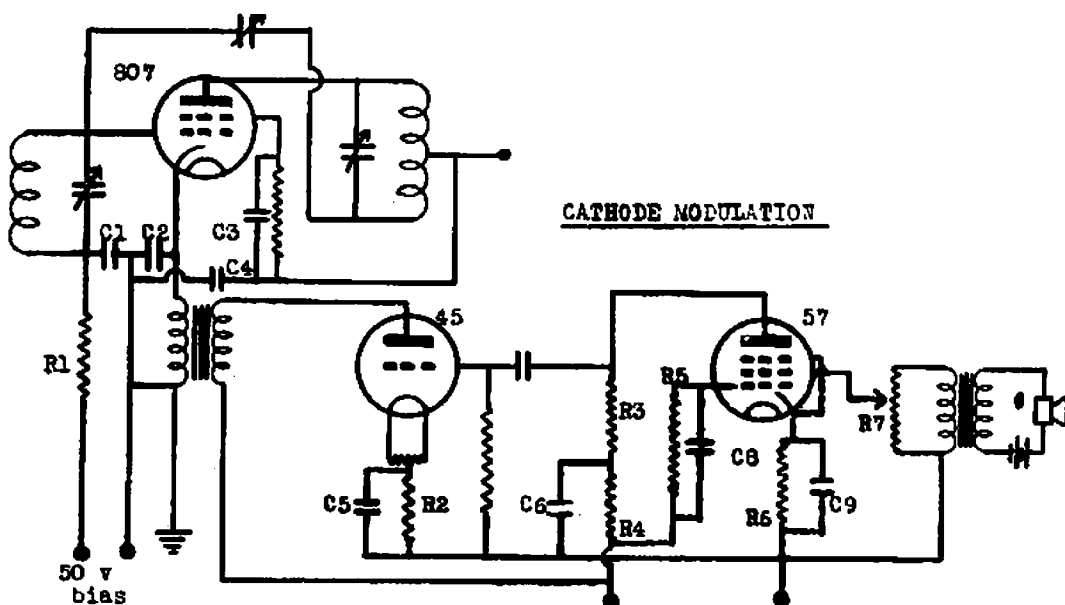
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effect on quality and output. The downward kick of the plate meter is only in the region of 5 mills. This effect is probably accounted for by the fact that the secondary voltage on the modulation transformer is acting as extra bias and would on peaks reach a value which would tend to reduce the plate current of the tube. Another point to watch is

antenna coupling, which should be fairly tight.

In conclusion I would like to say that the efficiency of the stage is well up to that of a stright unmodulated Class C stage as the output is a good 20 watts of r.f. for an input of 30 watts, whilst depth of modulation is all that could be required.



- |               |                   |
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| C2. .001 mfd. | R1. 10,000 ohms.  |
| C3. .002 mfd. | R2. 1500 ohms.    |
| C4. .002 mfd. | R3. 250,000 ohms. |
| C5. 4 mfd.    | R4. 50,000 ohms.  |
| C6. 8 mfd.    | R5. 2 megohms.    |
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# World Radio Tour with VK3MR

## PART 2.

With the editor's blessings we continue on our trip around the world. Last month we were in the Dutch East Indies and we had just finished locating the VS gang. Dutch islands here are Java proper (PK1, 2, 3), Sumatra (PK4), and crossing the Java Sea we come to Borneo (PK5), and Celebes and Molucca Is., who sign PK6 with Dutch New Guinea. Timor (CR10) is the only Portuguese island here and is the first sight of land obtained by the flying boats on leaving Australia across the Timor sea. Going further north we find the familiar Philippine Is (KA), then to Taiwan I. (J9), and on to Japan (J), then across the Sea of Japan to Formosa (J8). These represent the main possessions of Japan. Starting from Manchukuo (MX) we continue southwards to the Malay Pen, and we pass China (XU), Hong Kong (VS6), and nearby Macua (CR9), French Indo-China (FI8), Siam (HS) and around the Malay Pen. (VS 1, 2, 3) up to Burma (XZ), to the land of real QRN, India (VU).

A few miles north of Calcutta is French India (FN), and on the west coast is Goa (CR8), another Portuguese possession. To the north boundaries of India are Tibet (AC4) and Afghanistan (YA). Continuing, we come to Persia (EP) and Iraq (YI), the last being Hejaz (HZ), which is in Arabia. In the Persian Gulf we also locate VS8, Bahrian Is. Little can be gained by going over all the African countries as they are set out clearly in the list and are very easy to locate on any map. Briefly they are:—VQ1 to 6, ZD1 to 6, ZC3, 4, 6.

VQ8 (Mauritius) is situated east of Madagascar in the Indian Ocean, and Chogos Is., also VQ8, can be found south of the equator below India. ZD 7 and 8 are St. Helena and Ascension Is. respectively which are off Africa in the South Atlantic Ocean. It is interesting to note that ZC2 and 3, Cocos and Christmas Is.,

are in the Indian Ocean right near the Dutch East Indies and these must not be mistaken for Christmas Is. in the Pacific, which is also a British possession, and Cocos Is., west of and belonging to Costa Rica. Malta and Gibraltar in the Mediterranean Sea are well known as well as ZE, SU, and ST. ZU9, is Tristan Da Cunha, an island some 1500 miles to the west of Cape Town in the South Atlantic Ocean. France has seven possessions in Africa and two islands off the east coast. They are CN, FF8, FE8, FD8, FL8, FT4, FQ8, FA. The islands are Madagascar (FB8), with Reunion Is. to the east (FR8). Portugal also have several countries here in Port Guinea (CR5), Angola (CR6), and Mozambique (CR7), and three islands of the N.W. coast which are Cape Verde Is. (CR4), Azores (CT2), and Madeira (CT3), Ethiopia (ET), Liberia (EL), and Belgian Congo (OQ completes the list.

There should be no difficulty in finding the European countries which are listed so I will not linger there. It will be of interest to those with beams to know the exact direction some of the cities are from Melbourne. North America: New York, 30 deg. north of east; Los Angeles, 35 deg. north of east; Quebec, 39 deg. north of east; Vancouver, 52 deg. north of east. South America: London via the south east passage, 39 deg. south of east; Ecuador, 21 deg. south of east; Buenos Aires, 58 deg. south of east or 32 east of south; Wellington (N.Z.), 10 deg. south of east. South Africa: Cape Town, 32 deg. west of south; Cairo, 6 deg. north of west. Asia-Europe: London, 39 deg. north of west; Berlin, 36 deg. north of west; Calcutta, 30 deg. north of west; Ceylon, 14 deg. north of west; Hong Kong, 40 deg. west of north. Cape Verde Is. and Sierra Leone and that corner of Africa is even further south from Melbourne than Cape Town, and Brazil is almost due south.

## SILENT KEY.

It is with deep regret we announce the death of Fred J. Kemble, VK6FJ, who died in the Norseman (W.A.) Hospital on 21st February after a relapse following an operation ten days earlier. Fred, who was only 24, was well known and liked among the amateur fraternity of VK6 and his death came as a shock to many. He left his home at Katanning in December last to take up a position on the Norseman Central mine and during that time his call was not heard. Many hams must have wondered why the one remaining Katanning enthusiast was not heard. His scholastic career was marked with brilliance and his interests apart from radio were cricket and football.

Sincere sympathy is extended to his parents, Mr. and Mrs. F. Kemble, of Katanning.

## VICTORIAN NORTHERN ZONE CONVENTION.

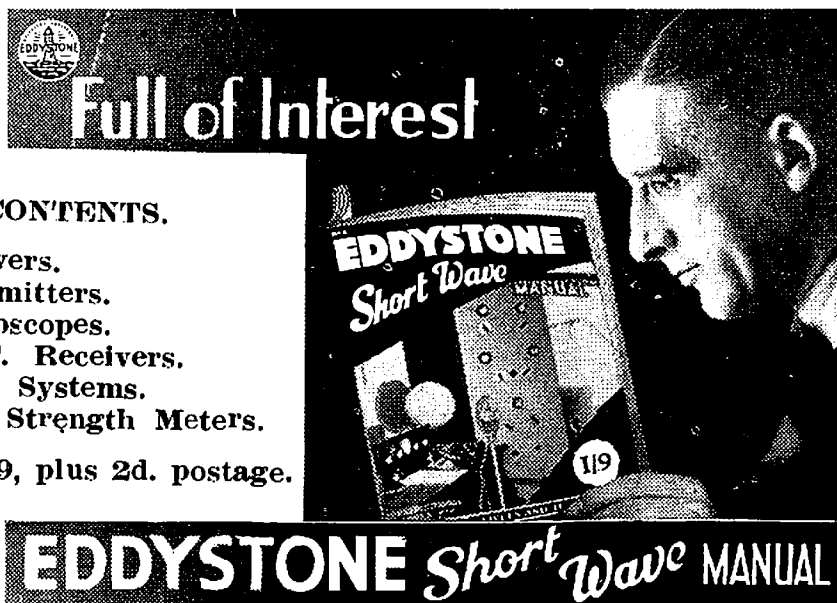
Zone members and metropolitan hams are reminded that the next Convention dinner and doings will be held in Bendigo on 29th-30th April.

## VK3WI TRANSMISSIONS.

The official broadcasts of the Victorian Division from VK3WI will be transmitted on 4,000 and 7,300 kc's. on Tuesdays in future at 7.30 p.m. These transmissions will be broadcasts only and the station will not be open for communications with listeners as the number of contacts of late has been too heavy for the operator to handle. Further arrangements are to be made to open the station on other nights for contacts on A1 and A3 waves. Details on this will be announced in the broadcasts.

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## Contest Section

(By R. F. Cohen, VK2TF, Federal Contest Manager.)

In presenting the last contest section for the year, a few general remarks might not be out of place.

The contests for the year, with two exceptions, have been well supported. These exceptions were the 80 metre VK-ZL phone contest and the National Field Day. For the phone contest only two logs were received from all VK and ZL, with the result that the contest was abandoned, a very sad state of affairs.

This apparent lack of support to some extent was caused by oversight, or, possibly, just laziness in not sending in logs. From the two logs we received we know that at least eighteen stations were participating, and yet we receive only two logs!

The National Field Day solicited only nine logs, which was rather surprising in view of its popularity last year. The fault here, I think, rests with the contest itself and not the participants.

After all, as a national field day, it is more like an international day, the national aspect being lost by allowing dx contacts to influence the score too much.

Next year I would like to see the rules revised so that (a) contacts must be within Australia; (b) a power limit of either 5 or 10 watts be enforced.

The power supply is always the handicap in portable work, and with a limit such as this a genemotor would not be essential to give the competitor a fair chance of winning. This, I know, would encourage quite a large number into the field with small rigs, such as a 6L6 crystal oscillator with about 150 volts of B battery as the power supply.

To date, I have been out in two Field Days, and I think everybody in the party agreed that, although conditions were poor and contacts few and far between, they had an enjoyable time, particularly when the antenna raising stage was reached.

One other suggestion to liven up contests. There can only be one

winner obviously, but if you think that you have little chance of success do not ignore the contest, stage a contest within a contest among your friends. A little friendly rivalry like this will greatly boost the contest in general and if you do not happen to be the ultimate winner you may have the satisfaction of putting it over the local lads, anyway.

Now for some results.

The 1938 Field Day only attracted nine entries. 3UK, last year's winner, recorded a double by again winning from 2LR, who was second last year. Vaughan certainly deserved to win after all the trouble he went to. His antenna system consisted of two beams rotatable through 90 degrees. The rig was a 6V6G tritot oscillator driving an 807 power being supplied from two vibrator units.

Results:—

VK3UK, 304	.....	.....	.....	1
VK2LR, 258	.....	.....	.....	2
VK4HR, 188	.....	.....	.....	3
VK3UM, 78	.....	.....	.....	4
VK4FB, 48	.....	.....	.....	5
VK4RY, 36	.....	.....	.....	6
VK6GM, 29	.....	.....	.....	7
VK4KK, 28	.....	.....	.....	8
VK2AGO, 141,	.....	.....	.....	
party, non competitor.				

The All Band C.W. Trophy attracted quite a good entry. 5JT is to be congratulated on his fine score of 1280, and, by the way, Joe, you do not receive bonuses for each weekend, but only once during the contest. 7AB, with 1238, and 2VN, with 1000, are also to be commended.

Unfortunately for 5JT, he received no support from any other VK5's, so as far as the trophy is concerned his efforts were in vain. The State with the highest aggregate of the first three scores is Victoria, and so the trophy goes to VK3. Congratulations to 3ZC, 3MK and 3XS for bringing home the bacon.

Results:—5JT, 1280; 7AB, 1238; 2VN, 1000; 3ZC, 985; 4AW, 860; 3MK, 820; 3XS, 744; 4JF, 642; 3UM, 550; 7CM, 545; 2AFJ, 510; 2OE, 495; 4HR, 456; 4RY, 455; 4RC, 405; 3RJ, 405; 6CP, 365; 3HG, 284; 4UR, 238; 4KK, 224; 7DS, 136; 4JB, 131; 3EX, 108.

## Federal and Victorian QSL Bureau

(R. E. Jones, VK3RJ, QSL Manager)

W3BGD, Albert Segen, operator of a private yacht advises that the yacht expects to be in Hawaii during March and may visit Australia later in the year.

Alan Brown, VK3CX, who recently sent away the necessary verifications for membership in the DX Century Club, has 134 countries on the board.

Bruce Mann, VK3BM, advises that VP9G still awaits cards from VK7JB and VK7KV regarding QSO's nearly two years ago. VK7 is a separate country, so in case you have not his QRA, Buck, here it is, VP9G, J. W. Gady, Box 404, Hamilton, Bermuda. In passing Bruce, who does all his DX from Quambatook, Vic., has worked 51 countries and 24 zones on fone. On CW the total is 2 countries, 2 zones. Shame.

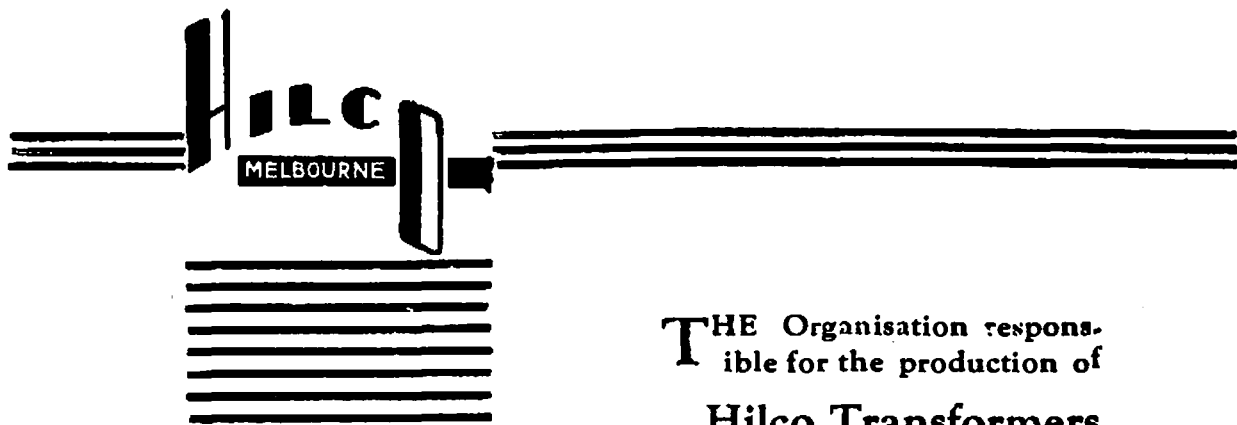
Stamp collectors requiring an exchange in France should write to F8BS, P. Bonichon, Ing, Saint-Aigulin (Charente-Inferieure), France.

An old call sign but possessed by a new owner is that of VK3KE, of Mentone. Joe, who will shortly be on the air, has a fist that will be an asset to the bands and along with 3ET, 3PI, 3CY, 3UE, 3XM and yours truly, pounds brass in the Telegraph Branch, Melbourne. At the moment, however, we have loaned Herman 3ET to the Telegraph Branch, Launceston.

Writing from aboard the Manunda, then anchored at Sydney, Andy Roudie, VK3UJ, states he is having a fine trip. Andy doesn't mention anything about his cabin mate.

Desirous of an Australian correspondent is Adolf Friis, Sonderport 25, Aabenraa, Denmark. Adolf, who is 18 years old, must have mistaken the QSL Bureau for a matrimonial bureau as he writes, "Would you mind getting a boy (or a girl) of my own age for me." He is interested in sport, languages, music and all sorts of mechanics. So what have you? Might be a good spec. for stamp collectors.

See the list of cards on hand in these notes in February "Amateur Radio" and if you haven't sent that envelope along, then do it now.



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## 28 and 56 M.C. Notes

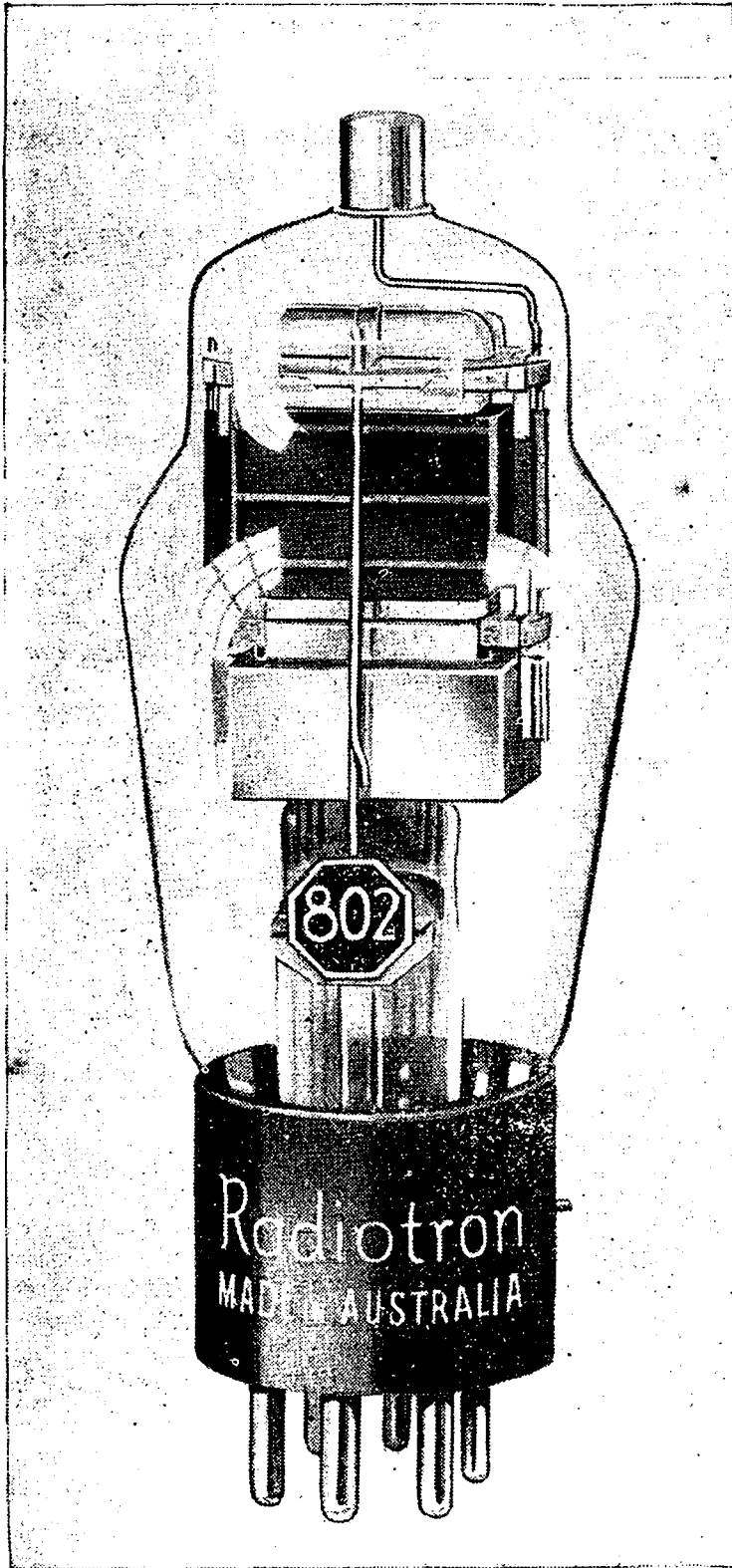
(By A. Pritchard, VK3CP.)

The W all band cw contest has just finished, and before these notes are in print the phones will also have been going hot and strong, as the saying goes. There have been some more big scores running, and ten metres have been showing some new or seldom heard sigs, although, unfortunately for us, they have been only for the States. TI2FG, VP6YB, XE1CM, LU9LU, LU9BV, LU5AN, LU1CA, CX1FB, J2JJ, J2KN and many others have excellent cw sigs judging by the reports given. J2JJ is often r8 around 11 a.m. during the week-ends. Many VK's have made the most of the good conditions, and with such a number of W's on the look-out, contacts have been continuous from 7 a.m. till 2 p.m., which shows how important it is for any enthusiastic contestant to put all possible time in on ten. VK2ALU, VK2EO, VK2UF, VK2RA and VK2TI made many contacts, the latter having two faint sigs here. VK6SA was the only VK6 heard here and called by W's although others were probably on the job. From this State, VK3IW, 3XP, and 3CZ did very well. VK3CX was also heard, and Alan is joining the 10 mx happy family. VK3GG is new on ten metres, and has 30 watts into an 807 final and is contemplating putting up a vertical rotary—the receiver is an RME69. W6PDB has been testing a 230 deg. Zepp type of beam with VK3BQ, who gives the following details. The beam has two 20ft. long wires in phase and in line and having a 7ft. stubb in the centre. The director reflector is the same length, and spaced an 1/8th wave length. The stubb has a variable shorting bar for giving the different tuning for directing or reflecting, and needs only a 6in. variation to give an 80 to 1 gain in the desired direction against the radiation from the right angle position, i.e. off the ends, as measured with a field strength indicator. Many thanks, VK2ALU, for the let-

ter. Yes, by all means, keep a look-out. I appreciate any dope hunting, believe me. 2ALU is in demand with such a sig from a Vee beam, having 8 waves on each leg at 10 mx.

VK3CZ has completely cured his big problem—that feed back problem—for trying all the lads' suggestions on how to do it and what to bypass, etc., had no effect. The trouble only disappeared when a small steel box was put over the first 3 valves, i.e., 57, 2A6, 56 (which were shielded), also a large steel cover completely over the whole modulator, now making it possible to turn the gain full on. Lately we have been hearing the W's calling HI7G, VPIDA, LU1DA, KA1ER and KA1AP on phone, the latter two having good strength here. Let us hope they turn those 3 element beams our way after the tumult and the shouting die. No reports are at hand regarding the last 5 mx field day, and hopes of contacts with VK7KQ on top of Mount Wellington. The weather was against VK3, and the day was not the best for portable gear in exposed places on the local mounts, etc. Our good friend, VK5KL, tells me that the lads there are either rebuilding for 5 mx or have immigrated to other bands, as activity is at a very low ebb. 5ZU has the 70ft. lattice mast nearly finished and ready to take the 5 mx beam array, and is also rebuilding, although still keeping schedules on Sunday afternoons with VK2NO. 5KL has been testing a tritet with a 6L6 tube and 80 xtal, and can get output down to 3 metres. The most outstanding and consistently r9 sigs for several months have come from W6POZ. The outfit has a 6L6 80 xtal, 807 doub, RK 28 doub, HK 56 buff and a pair of 100 TH in the final with 650 W. The mod. has a WE387 double button mike into a 56, 56, PP 2A3's and 100 TH in Class B. The freq. of 28530 KC gives the fol-

(Continued on Page 14.)



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## VK3MR's DX Notes

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Both the CW and the Fone ARRL tests are over and we await with interest the final scores. Scribe is still wondering if any VK has worked over 650 CW stations during this test. How? In the BERU senior test it seems that SU6EC may be leading with G5WP second. I would appreciate a few more VK scores in both the BERU and the ARRL test. I hear several loud moans from the CW men about the persistent use of fone at the high frequency end of 14 mc during the BERU tests. Yes, you would think they would let up for a while, although its likely they didn't know there was a test in progress as they usually have no BFO in their supers! Sit down Bruce!

VK2DG is having a rest from tests (No!), but has managed to collect 102 cards from DX countries and is claiming the right to join the select band of century club hounds. Some choice ones worked by 2DG in spite of his restricted activities are KF6DHW, Canton I., 14375 kc; KG6NVJ, Jarvis Is., 14360 kc around midnight; VP2AB, 14405 kc, 2230; CX2BG, 14400 kc, 2100; OA6FE, 14335 kc, 2100; LU4AG, 14295 kc, 1900; ZP7AA, 14460 kc (well out), 2030; PY1AJ, 14310, and PY1AL, 14370 kc, both 2100. What a list for S.A.! You make my mouth water. Don't know what the VK6's will say about it. The reason the VK6's can't work South America is because the south pole completely hides it and sigs just don't like going over it.

3HG is very modest about his DX work as to be expected. Using low power fone he turns up with things like FA8QC, FT4AN, 14400 kc, VP4ZA. This chap is the VP3ZA chap worked in the BERU test and is now on a ship and he will QSL and asks for cards to be sent via G8DF. Neil has 93 countries worked and 55 on fone and has 74 confirmed. Still getting good results with his Vee beam and is expecting big things when he gets the new vee over the

hill. Conditions seem to be improving all round now.

FONE.—Little activity reported from this quarter. It seems that the recent rains are keeping the country DX hounds quiet as they are busy with harrows, etc. This seems to be 3BM's trouble, and not the BFO reported last month. Bruce reports conditions for Europe the long way in the afternoons is improving and he has contacted SP2HH, 14075 kc; OZ5BW, 14040 kc; HB9CC, 14020 kc. Just a few from the rarer parts are as follow:—VP6LN, 14055 kc; CE3AT, 14015 kc; OA6AI, 14048 kc; LU6OA, 1400 kc; HK3CL, 14037 kc; GM3TR, 14140 kc from Orkney Is. 3BM has received some good reports from W on his 7 mc fone which are very gratifying to him.

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(Continued from Page 12.)

lowing measurements on the 1/10 wave spaced 3 element beam—3ft. 6in. spacing, 16ft. 1in. dir., 16ft. 9in. dipole 17ft. 3in. refl., made with 1in. diam steel tubing. The outfit is on a 200ft. high hill, 10 blacks from the Pacific Ocean at Hermosa Beach, i.e., 20 miles S.E. from Los Angeles, now power lines, only lots of water between us gives this terrific signal. VK3XP is making a very nice rotary 3 element beam with steel conduit, and hopes to have it in position on his lattice tower very shortly. 73.

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We have been asked to repeat the results of the 1937 VK-ZL DX Contest, Receiving Section, so here they are:—VK3ERS, 112800; BERS195, 30,510; ZL166, 44,032; BRS1535, 7280; OE151, 2528; HB9RNV, 5490; BRS311, 6820; HB9RKY 1592; DE3727/P, 8380.





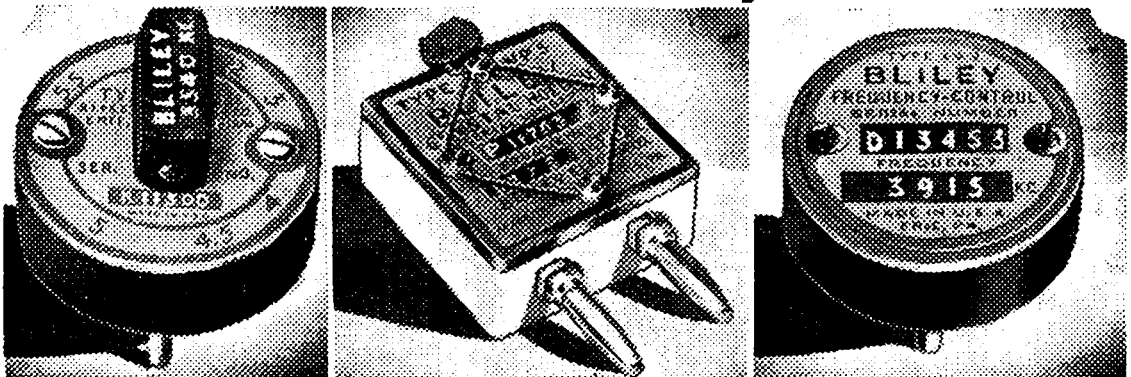
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## Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 15th of the month preceding publication.

### N.S.W. Division

#### COALFIELDS NOTES.

(By 2KZ.)

VK2YO.—Busy building a new rig for 14 mc, also fixing shack, making it more comfortable, but doing very little on the air.

VK2KE.—See you now and again, om, but doing nothing in the radio line; same applies to 2XT.

VK2DG.—Generally on the key any time you listen, doing considerable service work. Have you that new line up yet, om? Has an idea for a midget ring 6P6, 807, 808 built very compactly.

VK2YL.—Very unlucky to burn his rig up due to faulty insulation. Will not be active for some time to come, also going to Queensland on trip.

VK2CW.—Busy with YL, so radio just passes by.

VK2PZ.—On 20 metres on phone, using 809 final with 6L6G modulator, home made modulation tranny, quality good according to reports.

VK2KZ.—Using 14 mc, doing some good DX on the key.

Please send me your dope boys so as I can keep these notes interesting.

MAX.

#### ZONE 5 NOTES.

(VK2IG.)

Conditions on 20 are rather good here, though the rare DX pretty hard to find through the W-VE barrage. We thought QRM was bad at various times, but during this W-VE contest it made a new standard for QRM. When the W stations were resting the Europeans came through with rare punch, but beyond a few strays they consisted of the more usual ones such as G, GM, GW, SP, SM, EI, etc. If we have time we will mention a couple of strays in the DX notes.

2AFD is so busy running the AIR Force that he threatens not to renew his licence.

2AEO is worried as to what is DX. Reckons may be VP4 is. We dunno. Uses his ten as a beam tube. It has a window in the plate so as you can see the filament is doing its share of going red!!!

2OJ is back from his ZL cruise. We have heard him tuning the rig up so expect he will open his fone session with a Maori war cry.

2VK must have sunk in his little ship or just buried at sea. We aint heard of him.

2QE and QD birds of a feather, but quieter than the average cockatoo.

2AP a bit the same, but he has an excuse as is building a dovecote.

2IG trying to find DX among the W's. Oh yeah!!! Also put up a beam on South America and promptly worked Guam. Must have been an earthquake some place!!

2EU waiting on one of the mag advertisers to fulfill their promises. Ordered gear on ten days' delivery, but it's like the average QSL. They are not the only firm to miss either. What's wrong with these firms that they don't like to tell the truth?

#### BORDER DX NOTES.

(VK2IG.)

For those who haven't worked Portugal there are a couple of CT1 stations on consistently in CT1PC and CT1ZL. Frequencies about 14365 and 14360. HC1C with a rough note on 14390 is an easy contact but a hurry up qso! LY1KK on every night around 14340, but has been heard on others. GM8MN is easy on 14365 nearly every night and qso'd a lot here. KB6GXB is a new Guamite on 14310 and KD6DG near him most evenings. PK4KS is on Singep Island off Sumatra, but don't think you can count him out-

side Sumatra. YL2BZ heard but not worked on 14365. FK4 also heard on 14340. VP4ZA on most nights, but busy with W's. The same applies to VP5PZ.

## Victorian Division KEY SECTION NOTES. (By 3OC.)

Owing to misplaced confidence in the abilities of a certain piece of horse-flesh, your correspondent's outlook at the moment is a trifle jaundiced. The statement is offered so that any note of gloom or despondency that may be detected by my two readers will have their sympathy and understanding. Thank you.

Reminiscent of the above mentioned quadruped were the motions, counter-motions and amendments that failed to make the grade at the March prayer meeting. This wholesale falling by the wayside was a result of various attempts to get an expression of opinion from the meeting on the vexed Fone versus CW controversy. The outcome was that council will have to consider a recommendation from the Section to the effect that telephony be restricted on 7 mc and 14 mc to the frequencies of 7200 kc to 7300 kc and 14000 kc to 14250 kc. Enough comments have been made, opinions aired, and suggestions offered to make further remarks at this stage superfluous, and undoubtedly the ultimate result will be of keenest interest to all concerned. Strangely, or perhaps naturally enough, depending on the viewpoint, there are a few of the boys who do not view enthusiastically the time spent on this subject at recent meetings, and FR amongst others, voices a plaintive "Whaffor?"

Initial tests of RX's new ten tube receiver, which incorporates an 1851, EK2, two stages of 1500 kc IF's, noise suppressor, hot and cold folding doors, grey lacquer and crystal filter, resulted in a noise like the muezzin calling the faithful to prayer. Subsequent adjustments produced the noise of about ten thousand of the faithful telling the meuzzin what he could do with his trumpet, and Cedric has since been seen around a local emporium inquiring as to the price of ear muffs. At the time of going to press the receiver was not working, but if amateur

radio lasts over 1942, RX will be on the air with it. Here's hoping.

JI wants to know why conditions suddenly go bad during contests. Mr. Heavyside may know the answer to that one; cursory listening gave the impression that the CW half of the ARRL Test was not so well patronised as in former years. Your correspondent worked one W station, and has since been combing his fingers through his long white beard and pondering on the departed glory of the days when three or four hundred W's during the period were easy money. Those were the nights, when on going out for a breath of fresh air, one tried vainly to copy what the crickets on the back lawn were trying to send, and had thoughts of reporting them to the RI for using T1 notes. The contest and rebuilding of an exciter unit kept UM busy, while QV and IW shared the same frequency, much to the delight of the former, who let IW do the calling and contented himself with answering. An old trick, my masters, and a great time and energy saver.

Looking over a few members of the Council, we find UK busy arranging details for the forthcoming Convention, and keeping the R.A.A.F. Reserve members up to the mark. MR's new transmitter is still unfinished owing to trouble with the power supply, and to the fact that Snow was confined to his couch with an ague, which defied the purging draughts of leeches and apothecaries for well nigh a fortnight. ML is engaged and becomes the recipient of your correspondent's blessing together with the month's bunch of orchids. Omnia vincit amor, which interpreted means that DX may not be so good in the future. WG is still inactive, although the new super is taking shape, and another year or so may see completion.

CB reports himself as being quiet, although I've never yet heard that guy quiet. EN is testing portable equipment on 7 mc, and IK, fed up with QRM on his crystal frequency, is trying electron coupling. ED and XJ had a picnic trying to erect a three element 14 mc beam in a space too small to accommodate it, and decided to redesign it for 28 mc. This band will shortly have the attention of WD, who has been build-

## Amateur Radio

ing a super transmitter with an 807 and two 809's. DF and TU have a band switching exciter using a 6L6 tritet, 6N7 and 807 to drive push-pull 35T's on 28 mc, but apparently not quite the goods yet.

HK took time off from work on his 28 mc rotary beam, and in company with YK spent a holiday at the Lakes. Having a boat at their disposal, and YK being an ardent yachtsman, HK was initiated into the mysteries of rigging, and his next ethereal adornment should be something out of the box. JO is evidently not satisfied with what connects him to the ground, as in the March issue of "Amateur Radio" he was appealing for a copy of the legs of the participants in a recent field day, doubtless with a view to redesigning his supports on more aesthetic lines.

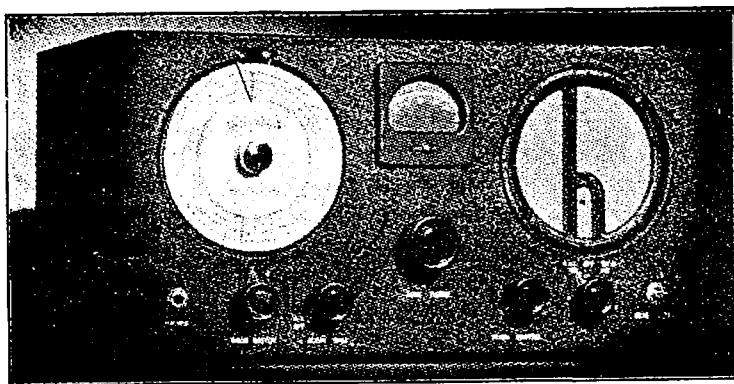
Had it not been for ML getting this bunch of orchids, they would certainly have gone to RX, who tells me that these notes are lousy. On reading them over, I'm inclined to agree with him. But I can't take it—

### U.H.F. SECTION.

(By 3DH.)

Next meeting of the U.H.F. Section at the Institute rooms, 191 Queen street, Melbourne, on Tuesday, 18th April, at 8 p.m.

For the month of March the members of this section have been treated to what one might almost call an extended disappointment. The 5mx Field Day, which was carefully recorded in last month's notes, was a "wash out," both literally and theoretically. All was set for Sunday, 26th February, but fortunately for Victoria and the country-side therein—but unfortunately for the members intending to go out for the day with 5 mx portable—the weather broke and steady rainfall, commencing on the Friday and unbroken throughout Saturday and Sunday, forced the majority of members to remain at the usual locations. There were, however, two exceptions out of the gang who definitely arranged to be active, namely Gil Miles, VK7KQ, and Val Barnes, VK3OT. Gil tried



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with absolutely no success to contact VK3 (via 40 mx) on the Saturday evening, 25th, and again on Sunday morning, the object being to find out whether or not the rain in VK3 was going to "dampen" the enthusiasm of our portable gang. This unusual condition on 40, left 7KQ completely in the dark, so as he said later, he had promised to go to Mt. Wellington, so off they set. They had with them a 40 mx receiver, but still could not hear much and transmitted and listened on 5 mx without any result.

VK3OT, who was scheduled to be atop Mt. Tarrangower, met with similar results to a certain extent. He set out on the Saturday in order to be all ready for an early operating start on Sunday morning; also with the object of perhaps doing some listening during Saturday night. However, Val did not even reach his usual location at the top of the mount, due to a very wet and unsafe track and had to camp on the mountain side. Apart from catching a cold he achieved little else. These two cases of unfortunate luck only go to show what the "Ham Spirit" is.

Other stations which were scheduled to operate from the home locations in any case, VK3YL, VK3JO, VK3DA, and VK3DH—with the exception of VK3DA—were on the job; also VK3QR, who was to go to Mt. Macedon, was contacted at his home location.

And so, as far as "yours truly" was concerned, the day was made up of QSO's with 3JO, 3YL and 3QR, all from their home locations.

3JO operated his usual E.C.O., 6V6, 6L6, 6L6 transmitter on about 58 mc with about 20 watts input.

3YL operated her usual C.C. transmitter on one or two crystal frequencies around the low frequency end—in conjunction with a beam antenna directed at VK7.

3QR was using a self excited modulated oscillator with very stable results and putting out a good signal.

3DH operated on crystal control on 56.064 mc., 42 tri-tet C.O., 6L6G, doubler, T20 buffer on 10 mx and T20 doubler to 5 mx (50 watts input), the latter stage being modulated by a pair of 6L6G's.

A certain amount of humour has somehow crept into the printing of

our notes for March. If readers who have not already laughed over the error, will turn to page twenty and read again the second paragraph on the top left—we leave the rest to you—our worthy chairman, 3JO, suggested that we may be able to publish some drawings of the "legs" in question, but we seem to lack the necessary artistic ability.

To return to matters of technical importance, I learn of antenna experiments at 3YL and 3JO via radio from these people. It seems that Austine's beam receives 3JO very well when her beam is horizontal and JO's antenna vertical. Results are not so good when both use horizontal beams. There is a lot more to this story-telling of strange wrong directional effects, etc., and strange results with combinations of vertical and horizontal polarisation, but as I heard, as late as 16th March, via 5 mx from 3JO that he has discovered a miscalculation in his beam assembly, we shall defer any full description. Maybe we could have an accurate write-up on the work direct from Herb and Austine.

During the month we received a letter from VK3BW at Portarlington. Arch is well on the way to doing good work with a couple of HY 25's in push pull on 5 mx. He also has a very good 5 mx converter going, ahead of the regular ham super.

If any other country members who contemplate doings or have already in hand an idea in the way of an interstate 5 mx relay, would let us know, it would be very greatly appreciated here.

Send rough notes to the secretary and we shall do all we can to make an interstate relay possible.

## WESTERN ZONE. (VK3HG.)

3II.—On 7 mc. with very nice signal. Having trouble with his house lighting batteries, but hopes to have the power on soon.

3TW. — Contacts the aforementioned station regularly. Also building portable equipment ready for emergency work.

3FA.—Active occasionally with QRP. Has worked four zones, and says the other 36 will not take long!

3SZ.—Not heard so much lately.

# Amateur Radio

3DX.—Still entertaining the BCL's as of yore with excellent transmissions.

3XG.—Very regular on Sunday morning hook-up, and getting the DX on 14 mc.

3TM.—Heard on 7 mc. phone. Hope to have him in on the hook-up too.

3BU.—Has antenna up on new mast and putting out fine phone on 7 mc. Very interested in 56 mc. work.

3WT.—Also interested in 56 mc. and active on 7 mc.

3BW.—Seems to be only on 56 mc now.

3OW.—Holidaying at Lorne.

3JA.—Lost his antennas in gale recently. Hasn't been heard for sometime.

3HG. — Working the Europeans quite regularly as well as other DX. Hoping to get the new antennas in action some time before Xmas!

Contacts for the "Worked all VE" operator's certificate, details of which appeared in the March issue, must be made on or after 1st January, 1939.

## EASTERN ZONE NOTES. (VK3DG-PR.)

It is hoped to hold the Eastern Zone Convention this year at Sale. The date has not been definitely fixed, but will probably be 10th-11th June. However, we will be able to let you know for sure next month.

The zone hook-up on Thursday nights has not attracted many so far and we would like to see more on the job. Remember chaps, Thursday

nights at 8 p.m. on 80 mx. As many as possible are asked to get on the job. Now for some doings.

VK3DI.—Jim on 40 mx occasionally, but YL qrm is reported to be the trouble.

VK3EA.—When are we going to hear that portable rig, Evan?

VK3HZ.—Is 3UL keeping you too busy, Murray?

VK3XZ.—Another from 3UL. Reported to be on 20 mx.

VK3QB.—Haven't heard you for ages, Jack. What about getting on the job again?

VK3PR.—Rebuilt xmtr. It looks nice, but there are still a few bugs to get out of the speech amp.

VK3WE.—Bill busy building portable gear. More for emergency use than anything else. Making a fb job of it too.

VK3XH.—Stan has rebuilt modulator now using 809's PP. Active occasionally on 80 mx.

VK3SS.—Keith not heard on much, busy with service work since fb rains in his district.

VK3LY, 3NO, 3GO.—All three busily engaged rebuilding at 3TR and getting along nicely, so should soon have some spare time for the ham game.

VK3IL.—Bob has not been heard of for quite a time, what are you doing, om?

VK3DG. — Has now re-erected poles and antennas blown down in recent gale and working a little dx on 20 mx. Trying out several different antennas.

VK3VG.—Heard on 40 mx with fone fb too, we are looking out for you, om, on 80 mx now for zone hook-up.



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## NORTHERN ZONE NOTES. (3HX, 3ZK.)

Firstly we must apologise for the absence of the notes last month. The usual scribe was on holidays, so we trust you will forgive us this time.

We would like to remind members of other zones of the Northern Zone convention to be held in Bendigo on 29th April. Arrangements are well in hand and an enjoyable and interesting time is guaranteed. So be there.

3TL.—Treb. is still getting some elusive DX. Also doing good work towards the success of the Northern Zone convention.

3OR.—Heard occasionally on 80 and 20.

3EP.—Now operating from Bendigo. Doing his share to make the convention a success.

3QC.—Who lives next door, putting out a nice sig. on 80. Has a mountain goat crystal, but has it tamed now.

3BG.—Just around the corner adding to the QRM. Still contacting DX.

3EC.—Has three separate PA's on 80, 40, 20. The latter not performing to expectations. Won't be long now.

3BM.—Interested in 5 mx. Should be active on that band now.

3CE.—Hasn't been heard of for months. Where are you, Roy?

3WN.—Just back from fire demo. at Ballarat. Met some of the gang down there.

3AI.—Staged a comeback, but believe the ~~4~~ is in pieces again.

3NN.—Installing new power supplies and a nice sig despite QRP.

2AHY.—On again after a break. Also QRP, but a fair signal.

3IH.—Has been in hospital. O.K. again now. May be off the air for a period.

3HX.—On the job in between trips. Quite a busy young man.

3ZK.—Contemplating a rebuild.

We would like to hear from various members as to their activities, etc. What about it gang? Write to Box 123. Swan Hill.

## Queensland Division

At the March meeting nominations were called for the various executive positions for election at the Annual

General Meeting. In all cases, with the exception of councillors, nomination were selected unopposed, so at the annual meeting the following elections will take place:—President, A. E. Walz, VK4AW; secretary, Geo. Hughes VK4HU; treasurer, W. Chitham, VK4UU.

Conditions generally have improved out of sight just prior to the ARRL cw contest, particularly on 20 and 10 metres. 40 metres saw quite a number of W contacts taking place. Incidentally, there are a few W fone stations to be heard working ZL stations on 75 metres around 11 p.m. E.S.T.

4UR, 4RC, 4AW, 4PX were on during the cw section of the ARRL. 4AW reported working W every 4 minutes during the first week-end on 10 metres.

4RY.—Has a new 5 tube super and just getting used to the controls. Has now landed 97 countries.

4EL.—Now up to about 106 countries. What about letting us start a Century Club? What say, gang?

4JP.—Is going flat out in the fone section A.R.R.L. Now worked BERTA, and awaits cards. Total countries on fone to date 66. This boy gets out.

4KH.—Just returned from hurried trip south, and working again on 20 fone.

4AP.—Changed his place of business, hence not heard for a while.

4WF.—Bill Faber, engineer at BC station.

4AY, Ayr.—Sends hs 73 to the VIB gang, and hopes QSO some of the old boys.

4AG.—Arnold Greenham, of Innisfail, paid visit to VIB and had long yarn to 4RP of the same town from 4AW shack.

4ML, from Richmond. — Flew down to Sydney and back on business. How we envy you, om.

4FJ.—Appointed Zone Manager to take office from April. Country men, please note. 4FJ is on cw and fone on 40L band, and will be happy to keep any skeds you desire.

4CU, of Clifton.—Had the pleasure of visit from 4RY recently, and long yarn on conditions generally. Think Charlie can claim to be the oldest active ham in VK4; dates from about 1924-25.

# Amateur Radio

4UV.—Just purchased a new motor cycle, all "streamlined plus." Working the Casino gang, using tritet oscillator and a wire tossed out the window.

4FB.—Any rumours to the effect that Fred is dismantling the gear prior to an exit are false; the transmitter is being completely rebuilt.

4WT.—Worked a new one in an LY from the new location at Red Hill.

4RT.—On 20 and 10 with 807 in final. John struck a spot of bother; found himself on 10 instead of 20. A case of getting his coils mixed, or was it his drinks?

4HU.—Looks like another prospect for the portable section with his new 8 h.p. Vaux. George just joined the Army Sigs. Section.

4HB.—Just been appointed Secretary, Brisbane Glider Club.

be remembered Mr. Ragless represented South Australia at the convention held in Tasmania four years ago.

On Sunday, 19th March, a test out of the emergency network was held and proved useful in giving participants good practice in such procedure needed in times of emergency. Four stations in outlying districts worked with a control station which in turn worked with a central station on another band. Messages were given and information passed on with proper procedure. Co-operation from a plane to ground with five metre gear kept those at the central station informed as to what was going on that could be seen from the air. In all, everyone had a great day. The annual general meeting will be held on 19th April, so all are asked to attend this night. One cannot write without mentioning the disaster that occurred to Bill Heinrich, VK5HR, whose shack caught fire from backfire from his petrol driven engine, and in saving his gear Bill was severely burned. Please accept our sympathy Bill and sincere wishes for a speedy recovery.

## South Australian Division

(By VK5KL.)

The delegate to the convention held in Melbourne to represent VK5 is Mr. G. Ragless, VK5GR. It will

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299 Chapel Street, Prahran — — — — — Wind. 1605  
3-5 Riversdale Road, Camberwell — — — — — W1188  
97-99 Puckle Street, Moonee Ponds — — — — — FU7822

Conditions on the 7 mc and 14 mc bands are rather good, but QRN has been particularly heavy of late. The W test has brought to light the usual swag of American contacts to be obtained during this test. VK5ZU reports 10 mx very quiet, and 5 is the same, no one being active on this band. Great interest has been taken in the R.A.A.F.W. Reserve reorganisation in this State and by the number of forms sent out should have a good waiting list as the quoted number for VK5 is only eighteen members.

As Easter is at the beginning of April this year we can take the opportunity of wishing all a good Easter.

## BARKER ZONE.

(By VK5GW.)

Conditions here are absolutely bad. I have been on the air every day this month listening to the BERU and W tests. We can hear plenty but are unable to get out. I managed to rake in a G, ON, YU, PK, ZX on 20 mx, but never worked a thing on 40. Have tried almost every antenna that it is possible to rig up, including beams, but with very little effect. The above stations were worked on the old end-fed zepp.

During the whole month I have not heard a VK5 on either 40 or 20 mx so you can see what this Q.R.A. is like. Nor have I heard from any of the hams in this zone.

5XR is putting over good fone on 40 and 20, but is not having much luck due to conditions around here. He has got over to KA a couple of times, also to W.

A queer thing about conditions is that one has only to go about seven miles out into the country and conditions absolutely change. Stations from Europe, South America and South Africa come in at R7-8.

## WAKEFIELD ZONE.

(By VK5RE.)

VK5LR.—Had the pleasure of a real he-man Q.S.O. with Jack recently and very fine fone indeed.

VK5LC.—Les spent a few days in Renmark recently. Tried to talk him into swapping his farm for my fruit block, but nothing doing!

VK5GS.—Pete still putting out some fine cw.

Ron and Nancy Green recently had a shifting day—and they are now installed in their new gra. By the way, Ron recently built a refrigera-

tor that works! OK for the beer.

Merv. Tucker still studying hard and still has a nice motor boat—when do we go boating Merv.?

5RE has been too busy attacking the fruit problem to do much operating. So am afraid cannot give details as to local operating conditions, so I would be very pleased indeed to hear from any of the gang.

VK3PX and YF called in from Mildura a few weeks ago and had a look around. Always glad to meet the VK3 gang, especially Harry.

## GREY ZONE.

(By VK5LC.)

Here we are again boys, another month gone by and still no notes from some. However, had a visit for a week-end from 5RJ and 5HR complete with XYL and YL and we paid a visit to 5YM, 5NW, 5BK and 5MP, and have notes to-day from 5LG, so do not expect notes from those visited this month, but will be looking for them next month on the Friday before the 10th from you all.

5HR.—Poor old Bill after having a good time over the week-end had to go home and have the petrol tank of his lighting plant blow up and land him in hospital. We are all sorry to hear this, but buck up Bill, o.m.

5RJ.—Wait till you hear the new rig on the air Darce, how are coaxial lines and SO2?

5NW.—Bob still very busy all the week with talkies, but is home week-ends and should be on, but Bob has a mo-bike and maybe YL, eh!

5BK.—Jack still at 5CK, but comes on now and then with a note like nobody's business. Jack had a snake for a companion for some time, but didn't think the snake liked him, so rang up 5MP for a gun.

5KJ.—George using one watt, pending new rig.

5LG.—Leith tells me that has TRF perking again, also all emergency equipment ready which works well on 90 volts B batts., good boy. Special note for me to blow up council re no news of doings and no news of BERU and W VE tests.

5YM.—Norm has been QRL for 2nd Class Ticket. Went down for exam last Tuesday, we all wish him luck.

Those who have not been heard and no notes are 5WG, 5WJ, 5TL, 5HS, and you other chaps that may be members.

5LC.—After 5RJ and 5HR went home and as we couldn't hear a thing on 20 mx while they were here, I thought would go down and see if I could get some DX. Worked KA1PI on fone 3½ watts, Q5, R7, and CT1ZZ and CM6AM on CW. I am now sure the Vee Beams work!

## Western Australian Division

(VK6WZ.)

(General Meeting held every second Tuesday in the month at 8 p.m. in Division Headquarters, Rooms 2 and 3, Melba Chambers, corner Hay and Milligan streets, Perth.)

Conditions have been rather patchy over here, but 14 mc took a turn for the better during the month and several stations renewed contacts with W. Several optimistic remarks were heard to the effect that the conditions seemed to be on the improve. Hope this is so, but "flash-in-the-pan" is an expression often applicable to radio. 7 mc already shows some promise of winter DX, but has some very noisy spells.

In the Winchell Way—

6MW missed February meeting—strained larynx said to be cause—this fone DX.

6BW all set to burn holes in 56 mc with fifty-watt c.c. rig—will have run off 19th March sked before this reaches print—here's hoping for interstate.

6WG once of Wiluna now active again at Albany.

6AZ heard clicking (!) the DX from Youanmi—heard working 5WM (ex-6WM) on 20/2/39.

6BB and 6CP went snooping at new airadio station one week-end to see remote control—large man in White appeared and asked "whaf-for?"—when he (ex-9AW of Rabaul) heard they were hams all ended happily with kind inquiries about W.I.A. and strong possibility of Institute party being shown over—whoopie!

6JC not yet active from Charlie's Creek—finding kitchen stove poor substitute for power point where soldering is concerned.

6MM (another "chalkie") said to be somewhere in Manjimup district—sad loss to 6HT—you'll have to

operate the station yourself now, Harry.

6ZO blows the dust off now and then—has 6V6G, 6A6, 807, 809 with 6L6G's for modulators.

6FO made a comeback the other Sunday—awful shock for 6CP, who was first QSO—rumours about YL student as protege.

6GB threatening to make me eat my words—says he would like 6L6G's in place of 46's—also darkly threatens to go 56 megacycling.

6JS heard calling "CQ twenty" on forty on 10/3/39. 3VG called him (on forty) but Jack must have been listening on twenty—beats the band(s).

6GA has invented two half-waves in phase guaranteed to radiate equally well in all directions—pat. pending!

6AF joined ranks of "chalkies"—teach 'em the code Allan.

6YL not heard these days.

6WZ developing folded antenna—neighbours now convinced crazy. Technical note.—Do not use sand-filled bottles as weights for vertical sections—very painful.

## Tasmanian Division

(By 7YL.)

The attendance at the monthly meeting held on the 14th was rather poor. Several members sent apologies, being unable to attend owing to "shift" work.

It has been decided to hold a 5 mx field day at the aerodrome at Cambridge. With the co-operation of Mr. Shorthouse, who is an experienced aviator, a 5 mx transceiver will be installed in one of the planes, and communications are to be established with other transceivers at various places within a 30 mile radius of Cambridge.

It was also decided to apply for a 200 mx permit for 7WI, and have a regular Sunday session. If the application should be successful, licensed operators will take turns to conduct the programmes.

It is urged that all amateurs should make an earnest endeavour to be "active" hams. Upon totalling the numbers, it was found that about 20 per cent. of amateurs in VK7 were active; the remainder were heard about once every six months, or else

not at all. In some cases, it would take a lot of cleaning to rouse the spiders and their accompanying cobwebs from the gear. Three years ago, every Sunday morning and evening, a regular "mother's meeting" was held between members of this division on the 40 mx band. Now listening on 40, the absence of VK7's is most conspicuous. Still, we will hope for the best, and trust to hear lots of VK7's in the near future.

## Scandal.

7CM.—Very busy these days at the University, but can be heard very often on 20 or 40. Does the e.c. xmtr ever wander, Charlie? We wonder.

7PA.—Not heard often, but Peter is often tied by shift work, and consequently is on the air when most of us are hard at work.

7AL.—Heard c.q. testing on 40 during Yank test. Couldn't you read the naval op's fist, Tom? (Hi!)

7CT.—Terry will, by the time these notes go to press, be on the air with a crystal-controlled rig. Will be using a vibrator unit for his d.c. supply. Promises to be responsible for the come-back of at least four old members. Fb, om.

7AA.—Pop entertained two naval ops from the "Canberra" recently. All had a fine time, we believe examining the gear which our president constructed when wireless was in its infancy here.

7JB.—Finding VIC weather most agreeable (?). Wishes to be remembered to all old friends in Tas.

7YL.—Wondering if the rumour that a certain VK3 C.W. man has purchased a new mike, valued at fourteen of the best, is correct.

## NORTHERN ZONE.

(By VK7LZ.)

No further meeting of the zone has been held since the last notes were written for this column. However, we have received word from the State secretary that all our proposals, namely, The Northern Zone to consist of all Tasmania north of Conara . . . The handling in bulk of our QSL cards. . . That the Northern Zone be self supporting, have been accepted by State headquarters. The April meeting of the zone will be held at the Y.M.C.A., Launceston, at

8 p.m. on 27th April, and if any "out of town" zone members are in Launceston at that time we would be glad if they would attend the meeting.

The W-VE contest has just concluded and zone members heard calling test were 7KR, 7GJ, 7DS and 7LZ. 40 metres seemed to be the most active band at night here with the W's and VE's coming through well. Other countries heard were J, XU, J8, VK9, PK1-4, VU, VS6, and VS7. Next time 20 is poor why not give 40 a chance.

Isn't there any active amateurs out of Launceston these days? Judging by the answer to my appeal for letters regarding their activities, it seems as though the answer is definitely NO.

7GJ is busy here rebuilding.

7RK.—Heard on 20 chasing DX and hopes to be on more when I have returned all his gear that I've borrowed from him.

7KR.—Busy with secretarial duties, but manages to work a few between times.

7CL.—Gets home from Devonport some week-ends and heard on 20 metre phone chasing DX and rag-chewing.

7AB.—Sorry to hear, Doug, of your wife's illness. Hope to hear you on mare again soon.

7DS.—Just worked his first DX station. Congratulations, Hugh.

7QZ.—Now building an all-band exciter unit for flexibility and easy band changing.

7LZ.—Just finished W-VE contest as no one else except W's wanted to QSO—at times it seemed as though they didn't want to either.

7BQ.—Just arrived back from a cruise to Sydney and Brisbane.

No news from 7LC, 7CJ, 7LG or 7AM.

## New Guinea Notes

(By VK9VG.)

9DK.—Ernie is using his new rig (6L6 tritet 807 final input 17 watts) and is taking on allcomers. Wrkd VU, K7 es lots of W's. Was doing some wrk on the rig hr es hrd W7DX calling cq at 2 p.m., but as condx hr were not so good did not call him. Next thing he was qso Ernie es telling him he was the best VK9 fone he had ever hrd. Reached down es pulled up both socks and threw the

## Amateur Radio

rig on the air but had to dash off to wrk before he had finished with DK. Ernie puts great faith in his two half waves in phase but has a rotary in mind.

9BW.—Has shifted again and is now at Bulolo, but as far as I know is not on the air. The secrecy you chaps maintain about your doings is amazing and helps the dx notes a lot. Has the 110 volts got you tricked, om?

9WL.—In last month's notes we left Laurie on the verge of giving up ham radio es taking to raising chickens (or was it home-brew?), but the trouble in the rig was located in an open input tranny and he was on the air again for a few days. Then his modulation tranny went es I guess the first batch of chickens or h.b. is well on the way.

9RC.—Had a letter from Ron es he tells me his gear is giving a lot of trouble. His xmtr went on the ice and then his RF receiver gave up the job and then the broadcast rx petered out. All with the same complaint, "tropicalitis," which is the same as measles, but you can't see the "spots." You chaps down on the coast sure have a tough time trying to keep your gear dry.

9MC.—Don't know what "Wewak Willie" is doing these days, as I haven't had time to get on the 40 metre rag chews, but last time hrd was putting in an R9 sig es fb fone too. Never hrd you on 20 mx and you should put out a good sig there too oc. Let's have the dope on it some time Bill.

9GW.—Too busy for ham radio these days, but will be on again soon at his new QRD. Hurry up, George, we can't let DK get away with all the pickings.

9XX.—Large chunks of silence from Basil. He must have heard the rumor that the capital is to be shifted es dismantled the rig in readiness. With 9GW away es off the aid the Rabaul BCL's must have very little to listen to. Anyway, let's hear from you, oc, even if you only write over for the loan of a few tubes.

9RM.—On the air and doing good work. Will answer all calls and has 500 fb crds just waiting for new owners. He tells me he sat up all last Sat. night es only had one QSO

and I can quite believe it seeing him next day. Never mind, Peter, when you have been in a few DX contests you will find it is just as easy to call cq asleep as when you are awake. Most chaps only wake up now and then to sign their call.

9DM.—Still waiting for the new rig to arrive, but heard sometimes on 40 on Sundays when off work. Last time hrd was all for 56 mc wrk. Good on you, Dudley, and let's hear more about that idea oc. I've used all the gear I had for 56 mc rig in other rigs, but will soon get some more if some of you chaps will get down to it. With 9BW in Bulolo now we should be able to do something. Before it would have been much better to get up on top of a mountain with a couple of flags.

9VG.—Condx are improving a bit now and dx is coming in again and the new NC10IX arrived safely, so all is well. Had a VK9 meeting in the shack a few weeks ago with 9WL, 9BW es 9RM present es the rest of the VK9's standing by over the air. Sat up all night wrkg dx, or rather trying to. Got a good hearing from KA's, who seemed to think it was an endurance test. At 2.30 a.m. very little dx was coming in es after calling cq a few times with no reply we asked KA1JP to stand by while we called cq es tell us if anyone came back we were not hearing. Back came a W6 with an fb sig es talking to KA1JP later he said he thought we were putting a "rough" one over as he could not hear the W6. Around about 5.30 a.m. 9RM decided to start building his rig es dragged us all into it. Ur humble picked on the pwr pack as that looked the easiest but drilling and cutting holes in aluminium chassis is not the best of jobs after an ill night sitting, so at around 8.30 I crept away quietly to the bunk, to find 9WL had beaten me to it by about ten minutes. 9BW carried on for a while es then pulled the switch too es left 9RM like the boy on the burning deck. "When all but he had fled." About 2.30 p.m. someone awoke and called cq es back came VK4VD R9, and the set on full bore. If you chaps will let me know in plenty of time when you are going to stage another convention I'll go bush for a few days.

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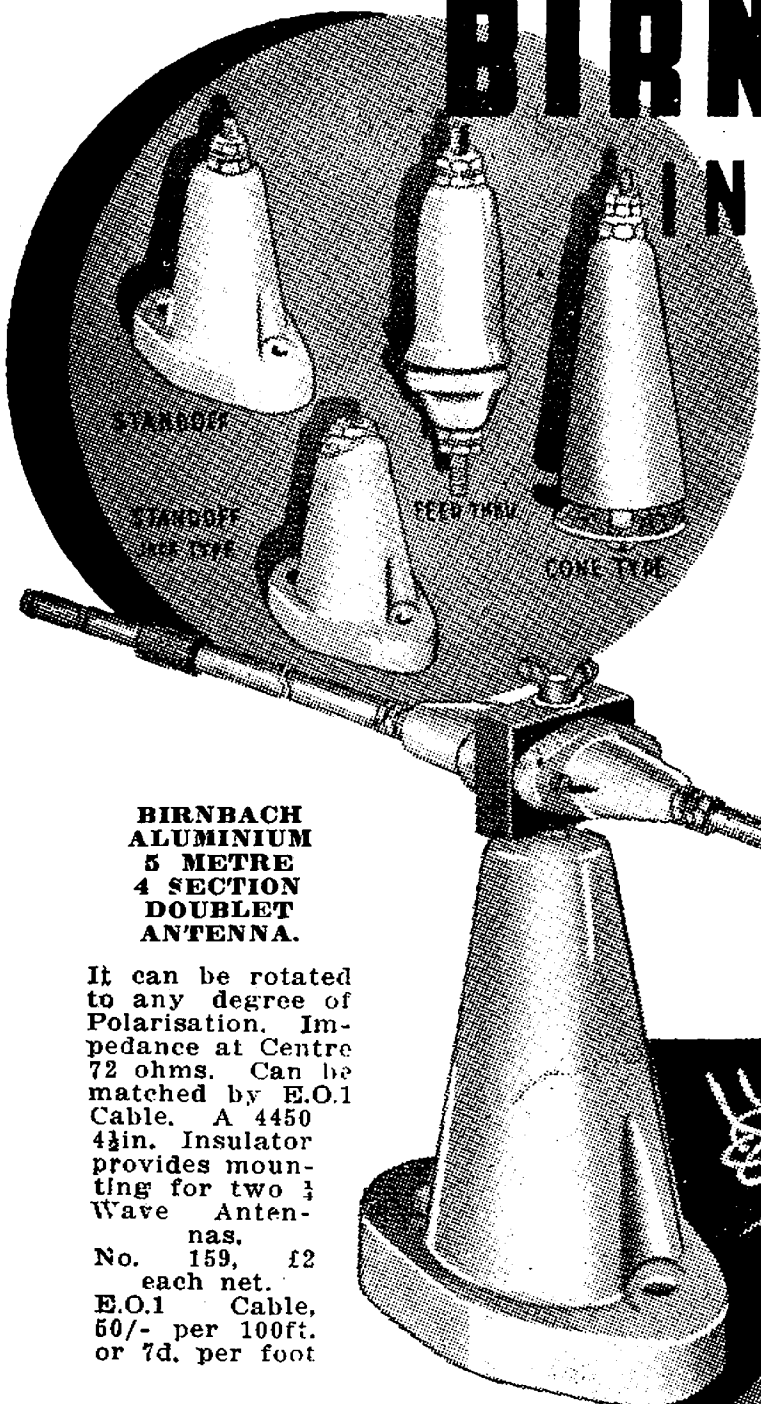


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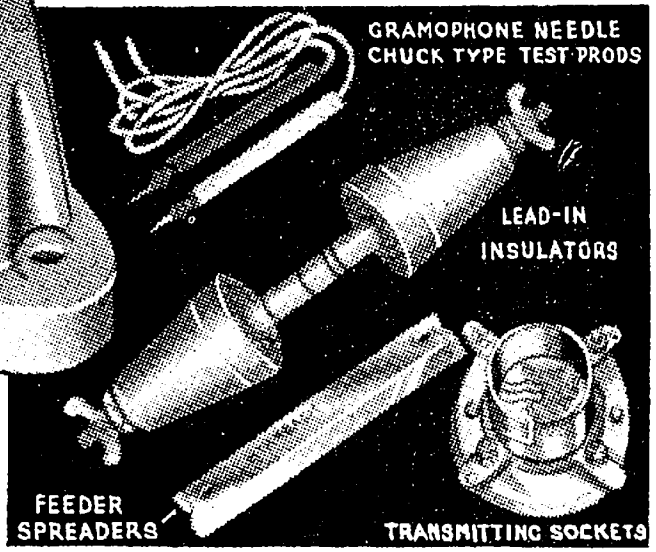
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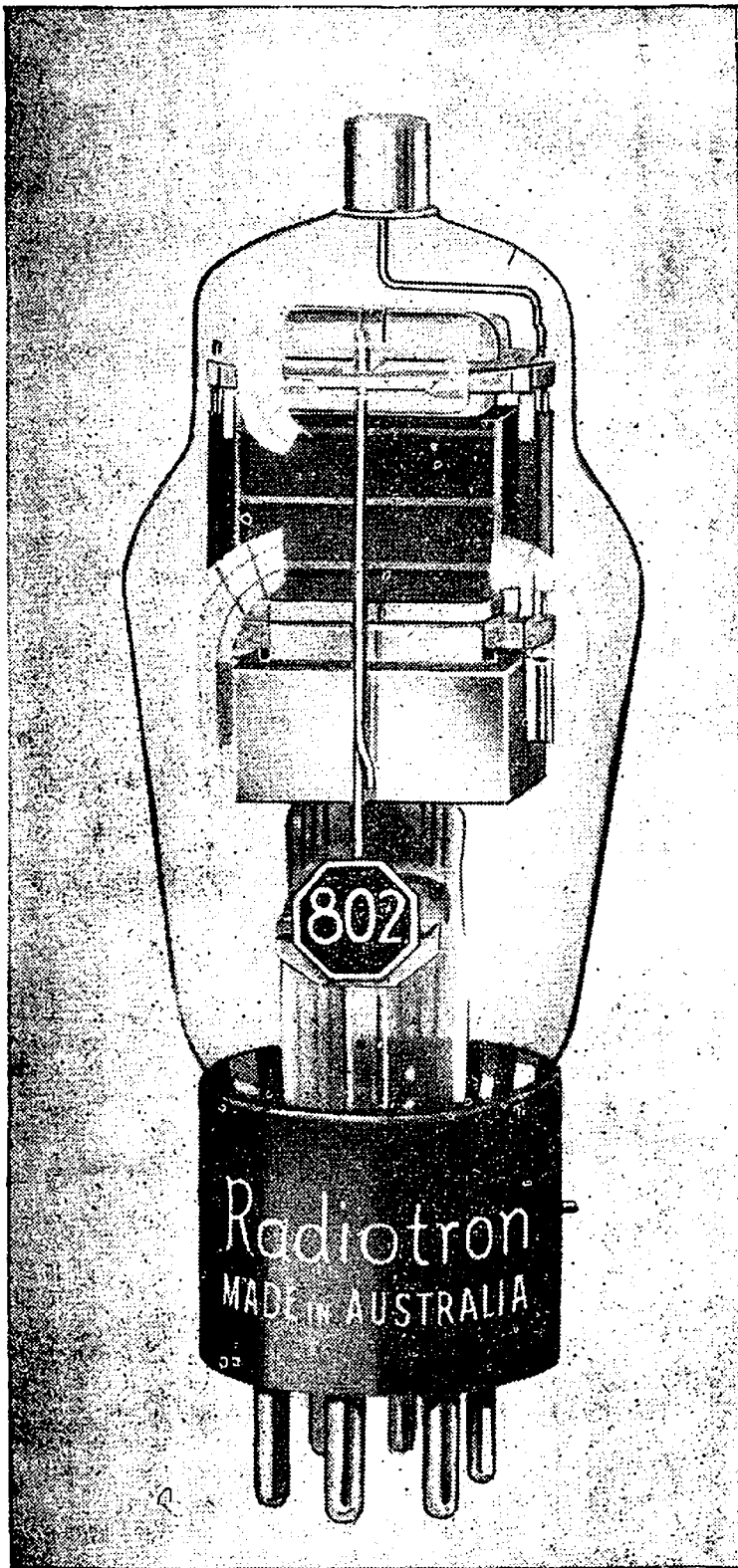
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# RADIOTRONS

## Editorial . . .

Probably never in the history of Amateur Radio has the necessity for adequate representation, internationally and within the confines of each country, been so imperative as to-day. The "battle for frequencies" accentuated at Cairo cannot be fought by the Amateurs as individuals and we may truly be proud and contented that the I.A.R.U. is our representative body internationally backed so solidly and effectively by the A.R.R.L. in the first place and then by the weight of all affiliated societies throughout the world. In our own country we are also fortunate that our destiny is in the hands of such a well organised body as our society, the W.I.A., for from the average member's viewpoint it can be regarded as an ideally democratic body.

In these coming months some big decisions must be made by the institute; for instance, the Chief Inspector of Wireless, Mr. J. Malone, stressed at the recent Federal Convention Dinner the fact that the Department viewed with disfavour the increasing use of telephony in Amateur communication, particularly as there is a tendency among Amateurs to disregard the use of Morse transmission entirely. Mr. Malone said he considered that the Amateur would do well to spend more of his time in using cw, thus making more effective use of the limited frequencies available. He mentioned further that the Amateur must be prepared to expect commercial allocations to be made on the high frequency end of the 7 mc band in the near future.

These are two of many problems before us at the present time, a time, as we reiterate, that demands a completely unified front as never before. We must have a clear cut policy on all these problems. Ordinary members have ample opportunity in their divisions for expressing their considered opinions either at general meetings or through one of their

divisional councillors. A majority decision in the council means the passing on of the opinion to the Federal Executive and finally a majority decision of divisions means a mandate to the Federal body in their negotiations with the authorities.

Perhaps never before has a non-member of the W.I.A. had brought home so forcibly the absolute necessity for organised Amateur Radio. If he stays outside he deprives the Institute of the additional strength brought by his membership, but, from his own point of view, by not joining he deprives himself of the only effective way of voicing his ideas and shouldering his rightful share of the responsibility which activity in his hobby entails.

---

## The Federal Convention

---

The 1939 Federal Convention was held in Melbourne during the Easter holiday period. The delegates who attended were J. Corbin, 2YC, N.S.W., V. Marshall, 3UK, Victoria, H. Moorehouse, 7HM, Tasmania, H. Cadlecott, 2DA, Federal Headquarters. M. Campbell, 3MR, was proxy for Queensland, G. Thompson, 3TH, for South Australia, and H. Stevens, 3JO, for West Australia. In the absence of the Federal President and Federal Vice-president, W. Gronow, 3WG, the Victorian Division President, was invited by the Convention to take the chair. The Convention sat for 21½ hours and discussed over forty agenda items.

Decisions of general interest include:—

1.—The appointment of the Victorian Division to be Headquarters Division.

2.—The running of the annual National Field Day Contest as an interstate rather than dx contest.

3.—The next annual Federal Convention to be held in Adelaide during Easter, 1940.

(Continued on page 9.)

## Frequency Measuring Device

(By R. H. Cunningham, VK3ML, Technical Editor.)

The amateur's experimental licence requires that a station operating in the amateur bands shall possess apparatus capable of measuring frequencies. This demands the construction of a suitable frequency or frequency-monitor meter which is a relatively simple matter. There are limitations to the performance of home made meters of this type and the greatest of all is the calibration of the meter. The ideal meter would be one that could be constructed in a ham workshop and calibrated from a local standard source. Such a source on the higher frequencies is not available in Australia and one is forced to resort to some form of sub-sub-standard meter for the check. Several of our local hams have been in hot water with overseas frequency checking stations for out of band operation and it has been found that their frequency meters have not been sufficiently accurate owing to false calibration. Finally, even though a very reliable source of frequency standard may have been employed in checking a meter, there is no guarantee that such a calibration is going to hold over a period of years. It is well known that even in the commercial field frequency measuring devices are "run-in" for some years before being supplied to customers as "standards."

It is for these reasons, as well as others too numerous to mention, that the ham must seek some definite source of frequency standard which is available at all times to him and to use it for the initial calibration and for constant checks.

Of the few sources available the most reliable and convenient is found amongst the B/C stations who must maintain a stability within at least 50 cycles. With such a standard on tap to any ham in any part of the continent it is now just a matter of devising equipment that will allow this standard to be reflected into amateur bands. The requirements of a satisfactory amateur frequency meter might be listed as follow:—

- i. Must be capable of supplying frequency calibrations of known values.
- ii. Will generate sufficiently strong harmonics for use down to 56 mc.
- iii. Can readily indicate band edges.
- iv. Could be used for band location in any part of the H.F. spectrum.

It might appear as though we are asking too much of such a meter, but fortunately, the construction of an instrument of this type is simple and economical. I found the very job

**B** for BASSETT—the modern concentric transmission feeder that abolishes the use of spreaders and insulators. THE cable that gets 100 per cent. RF power into the antenna, and is as flexible as rope. Ideal for beams and mobile services. Available as follows:

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64 " 1000 "	13 " 1000 "
34 " 1000 "	64 " 500 "

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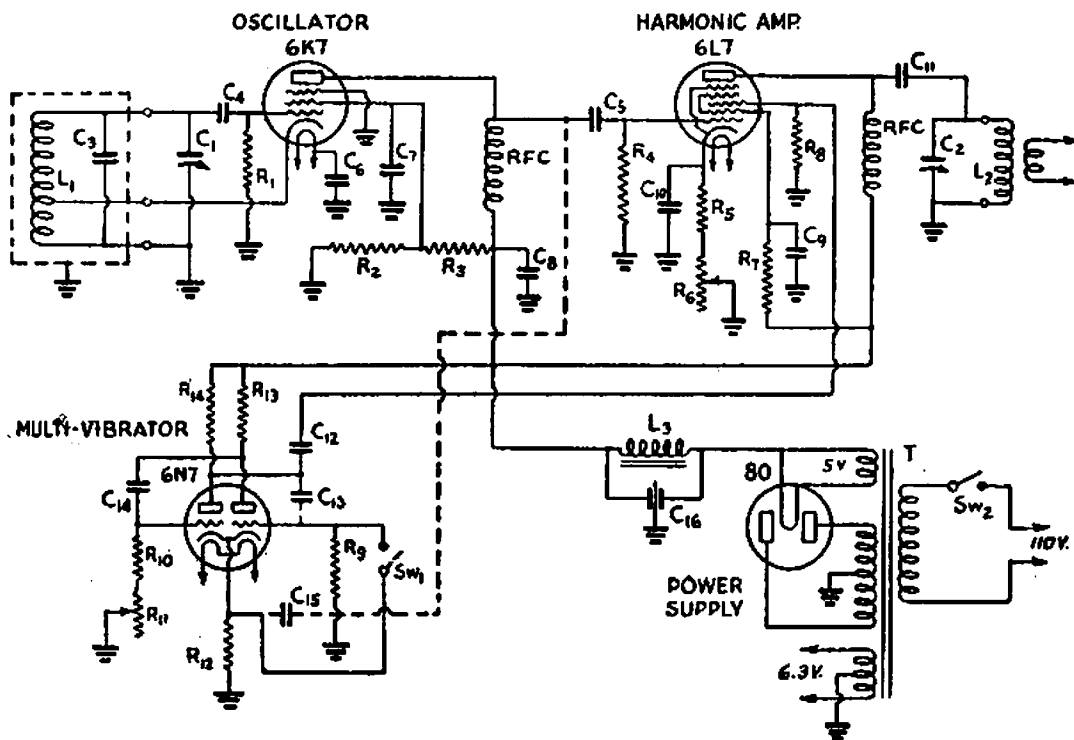
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to do all this in the form of an excellent article by George Grammar in QST for June, 1938. Rehashing is not the main object of this article, although it cannot be avoided. The idea of presenting the story is to illustrate how such a unit could be made from locally available material

and to try and encourage hams to adopt this simple and very valuable frequency measuring device, for their own protection and edification.

Readers are recommended to read Grammar's article as this write-up is only a brief resume of construction and operation.



- C1 100 mmfd variable (Eddystone 1130).
- C2 140 mmfd variable (Eddystone 1131).
- C3 0.0011 mfd low drift condenser.
- C4, C5 250 mmfd mica (T.C.C.).
- C6, 7, 8, 9 0.1 paper condensers.
- C10 0.01 mfd, 400 volt.
- C11, 12, 13, 14 0.002 mfd mica (T.C.C.).
- C15 10 mmfd trimmer (Eddystone 1100).
- R1 0.25 meg. I.R.C. resistor.
- R2 0.05 meg. I.R.C. resistor.
- R3 0.025 meg. I.R.C. resistor.
- R4 0.1 meg. I.R.C. resistor.
- R5 500 ohms I.R.C. resistor.
- R6 0.025 meg volume control.
- R7 15.000 I.R.C. resistor.
- R8 0.05 meg. I.R.C. resistor.
- R9 0.03 meg. I.R.C. resistor.
- R10 0.02 meg. I.R.C. resistor.
- R11 15.000 ohm. volume control.
- R12 300 ohms  $\frac{1}{2}$  watt.
- R13, 14 2500 ohm I.R.C. resistor.

- R.F.C. (where used, Eddystone 1066).
- L1 100 kc. Eddystone type 932/GY coil.
- 1000 kc Eddystone type 932/P coil.
- 10,000 kc Eddystone type 932/Y coil.
- L2 550-1200 kc 130 turns No. 28 enamelled.
- 1200-3300 kc 70 turns No. 20 enamelled.
- 3300-7500 kc 22 turns No. 20 enamelled.
- 15-6.8 mc 11 turns No. 20 enamelled, length 1 inch.
- 32-13.5 mc 5 turns No. 20 enamelled, length 1 inch.
- 56 mc 2 turns No. 16 enamelled, 1 inch diameter.
- All coils except 56 mc are wound on standard Eddystone formers.
- Tubes required: 1 6K7, 1 6L7, 1 6N7, R.C.A.

## The Circuit.

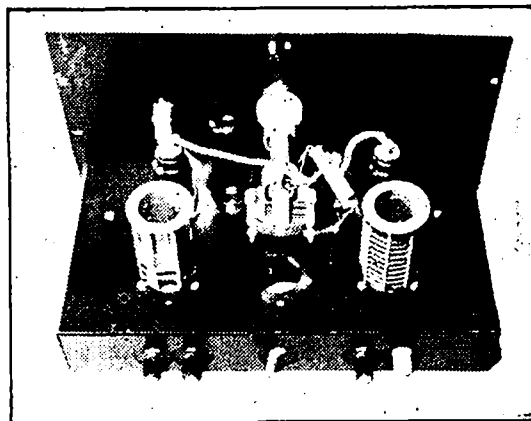
The circuit arrangement as reproduced here, shows an R.F. power generating supply in the form of a 100-kc electron coupled oscillator of high stability and an harmonic amplifier stage using a 6L7 tube. This stage is necessary in order that harmonics of a high order may be amplified for operation on the 56 mc band. Injected into the grid of the 6L7 is also the output of the multivibrator tube, the 6N7. With the oscillator tuned to 100 kc and the multivibrator locked in at 10 kc, it is possible to produce a range of harmonics spaced 10 kc apart, which may be amplified by tuning the plate of the 6L7 to the frequency desired. A link coupling coil wound on the tank coil former is coupled at the other end to the aerial terminals of the receiver. Besides the 100 kc oscillator coil it will be necessary to also have coils wound for RF generation on 1,000 and 10,000 kc.

## The Multivibrator.

A slender explanation of the operation of the multivibrator would not be amiss here should a reader not have this particular copy of QST. When the grid and plate circuits of a twin triode tube such as the 6N7 are connected by a combination of resistances and capacitances the tube will oscillate at a frequency dependant on the values of these components; in this case it is approximately 10 kc. However, a multivibrator is a highly unstable oscillator and when listened to on a receiver sounds like some of the 56 mc self controlled oscillators of days gone by! Fortunately it is an easy oscillator to "lock" and thereby control its stability. The principle is similar to a "locked crystal oscillator" where a self excited oscillator is made to perform on one frequency only by the presence of a quartz crystal loosely coupled in the circuit. With the 100 kc oscillator as the stable signal generator operating at several times the frequency of the multivibrator, it is found that the harmonic of this oscillator will be sufficiently strong enough to "lock" the multivibrator on 10 kc. It is important that the values of coupling resistances and capacities in the 6N7 tube be adhered to within reasonable limits otherwise the tube will perk

on something other than 10 kc. A frequency control is made for the multivibrator by means of the grid resistor R11. With the components chosen it will be found that the multivibrator can be made to lock from its 8th to its 12th harmonics. There will be one setting on the R11 scale where the 10th harmonic will be located.

Without the multivibrator of course a receiver will pick up the oscillator every 100 kc, which in themselves are valuable spotting points. With the multivibrator



locked at 10 kc a whole flock of signals will be heard over the bands spaced at 10 kc intervals. These spots are of immense value in measuring frequencies as well as locating a transmitting station on a known frequency day after day.

## Power Supply.

In this locally made instrument no internal power supply was incorporated but apparently no harm can result by installing one according to Grammar. However, having an Eddy-stone two tube receiver cabinet on hand it was found that the whole outfit, less the power supply, fitted in beautifully and was put into immediate effect. Of course labour saving was not the last consideration!

## Construction.

Anyone who has carefully built a two or three tube SW receiver will find the construction of this device just as simple. Rigidity is vitally important as well as the careful spacing of components to avoid heat effects from the metal tubes, especially in the 6K7 oscillator circuit. A range of plug-in coils for both the oscillator and amplifier stages is necessary and the number is depend-



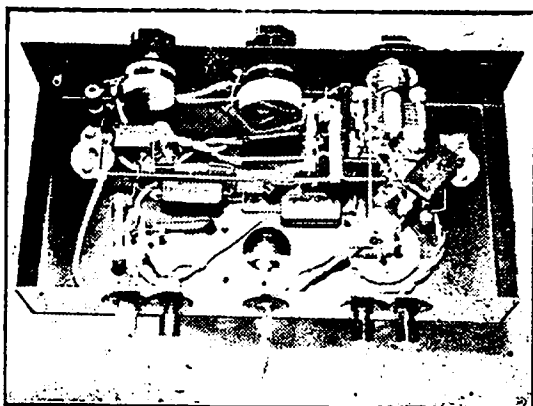
ant on the frequency range to be covered. For frequencies lower than 28 mc there will be no need for the 10,000 kc oscillator coil, and amplifier coils need only be wound for desired bands. Installing the whole works in a metal cabinet ensures freedom from hand capacity effects on the oscillator, but this is optional and if one cares to place a coil shield over the 100 kc coil "air protection" will suffice.

The photographs clearly indicate the layout chosen for this unit. The rear chassis view shows the 6K7 100 kc oscillator tube at the right with its coil along side. In the centre is located the oscillator tank condenser, C1, at the rear of which is the 6N7 multivibrator tube. The 6L7 amplifier tube and tank coil are at the left. Behind the 6L7 is the on-off multivibrator switch, SW1. Two heater and two H.T terminals at the rear of the chassis are apparent and likewise the link coupling coil lead for attaching the output of the harmonic amplifier to the receiver input terminals.

The under chassis view shows the amplifier tank condenser at the left with the coil base immediately in front of it. The centre variable resistor belongs to the grid circuit of the multivibrator whilst the one on the right controls the output of the 6L7 amplifier (R6). An additional feature incorporated in this unit over Grammer's version is the use of RF chokes in the plate circuits of both the 6K7 and 6L7 tubes. They are used as a precautionary measure as well as a convenient wiring mount for the H.T. Leads. The chassis

measures 12 x 6 x 2 inches with the panel at 12 x 7 inches. To guard against instability a solid slow motion dial was chosen with a 10:1 reduction and an adjustable insulated bracket holds the 100 m.mfd oscillator condenser firmly down.

The trouble of winding an oscillator coil for 100 and 1000 kc was finally overcome by employing two of the ready wound Eddystone coils which cover the desired range. However, for those who desire to wind their own a winding table is given.



### Preliminary adjustments.

The first step in adjusting the device is to set the oscillator on 100 kc. This is where a TRF or superhet B/C receiver with a BFO will come in. A list of B/C station frequencies will also be handy. Wrap a wire from the grid of the amplifier over the lead-in of the receiver. With the multivibrator switch closed and the receiver tuned dead beat to some B/C station operating preferably on

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some multiple of 100 kc, swing C1 over the scale until a beat is picked up by the receiver. In order to prove the oscillator is on 100 kc tune the receiver to another station on an even number of 100 kc and one should hear the 100 kc oscillator again within a few cycles. If it is not audible at this spot the fundamental cannot be 100 kc and it will be necessary to change C1 capacity until this operation produces a beat on the two B/C stations. When 100 kc has been located make a note of the dial reading.

Operation two requires a coil in the plate circuit of the amplifier stage. Choose say, the 3.5 mc band to play with. Pick up one of the 100 kc harmonics and swing C2 around until there is a definite increase in signal strength to show resonance. If this chokes up the receiver back off the signal by increasing R6. Record on paper the dial readings on the receiver where several 100 kc harmonics have been spotted.

Stage three brings in the multi-vibrator. Open SW1 and observe the glorious collection of signals that have sprung up over the band. Choose two adjacent 100 kc spots on the receiver and count the number of carriers between them (not counting the 100 kc signals themselves). There should be one less than the number of the harmonic at which the multivibrator is locked. For instance, if nine additional signals are heard, the multivibrator is locking at its tenth harmonic, and if the oscillator is on 100 kc the signals will be spaced 10 kc apart. If seven additional carriers are heard, the multivibrator is locked on its eighth harmonic and signals will be 100/8, or 12.5 kc apart. The 10 kc locking is obtained by the adjustment of resistor R 11. As this is varied the intermediate signals will jump suddenly from one frequency to another as the control changes over to a new harmonic. To use Grammer's grammar, there is no gradual change. This jumping, plus stability equal to that of the 100 kc points themselves, is evidence that the multi-vibrator is under control. In each step the resistor may be varied over a fair range before the control order changes. In general, the most desirable adjustment is the one which maintains the intermediate signals at about the

same level or shows gradual increasing strength as a 100 kc point is reached. Closing SW1 in the multi-vibrator will cut out the 10 kc beats and leave only the 100 kc markers. Periodical checks should be made to ensure that the harmonic order has not changed.

### Finding Unknown Frequencies.

The above procedure covers the use of the instrument in bands that are already roughly known on the receiver dial. However, when it comes to the great "unknown" such as 56 mc, one must first locate the band. This meter is a great value to hams in the bush in this respect in that their present difficulty in locating the band can be overcome. The 100 and 10,000 kc coils now come into the picture. Step one is to locate 1000 kc in the B/C band either by picking up a station on that channel or by finding the appropriate harmonic from the 100 kc oscillator. Plus in the 1,000 kc coil and adjust the frequency to 1,000 kc. Of course the multivibrator should be off. Now pick up the harmonic on 14 mc which is easy, and tune the receiver lower in frequency, counting the harmonics until the 4th from 14 mc is reached. The receiver will then be adjusted to 10,000 kc. At this point plug in the 10,000 kc oscillator coil and adjust C1 to give the same frequency. The harmonics will now be spaced at 10,000 kc intervals, which should eliminate any possibility of picking the wrong one as a 56 mc band limit.

At this point the 56 mc coil should be plugged in at L2 and coupled to the 56 mc receiver. The latter is then adjusted to the 56 mc harmonic, which, on the assumption that the receiver is capable of tuning through the band, will be 60 mc. The adjacent harmonics are 50 and 70 mc, which should be far enough removed so that there is no doubt which is the right one. Should there be any uncertainty however, it can be overcome by using an essentially similar process, but with the frequency higher than 10,000 kc say 20,000 or 30,000 kc. But assuming the 60 mc point has been located the final step is to change the oscillator to 1,000 kc again, set it as accurately as possible, and note the band limits. Points will be available at 56, 57, 58, 59 and 60 mc. It is of course

possible to go even farther and get 100 or 10 mc points using the 100 kc coil and the multivibrator.

## 56 MC. ACTIVITY IN W.A.

This Division proposes holding a 56 mc. test during the period 6 p.m. Saturday, 29th April, to 6 p.m. Monday, 1st May, 1939 (local time); it is our intention that five complete stations be set up, transmitters to be crystal-controlled, receivers are all super-hets. Schedules have been drawn up whereby each participating station will observe a compulsory listening period of approx. 12 minutes during each hour of the test, so that at all times there will be at least one station listening. Power used will be the maximum allowed and available, and it is hoped that we will at least establish a local DX record, if not an interstate one.

(Continued from page 3.)

4.—That a 160 metre contest be held during the winter months.

5.—That the Federal Executive co-ordinate 56 mc experimentation.

In addition, the Emergency Communication Scheme sponsored by the Victorian Division was passed by the Convention and is being forwarded to all Divisions. Finally, a new Federal Constitution was drawn up as the old one did not make provision for guidance on many new aspects of Federal and Divisional Government. One radical change is the new method adopted for payment of per capita fees for financing the Federal body.

Many matters of vital importance to the Amateur in Australia were discussed and courses of action decided upon, but until the outcome of negotiations with the appropriate bodies is known, publicity would not be in the best interests of all concerned.

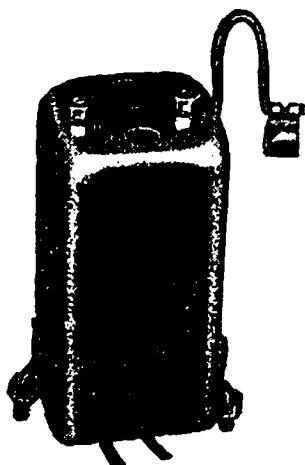


## EDDYSTONE SHORT WAVE COMPONENTS.

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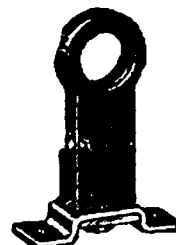
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## 1938 VK-ZL DX Contest Results

1155 G.M.T., Saturday, 1st October, 1938—A silence that could be felt.

1158 G.M.T., Saturday, 1st October, 1938—A few of the gang whose watches were fast.

1200 G.M.T., Saturday, 1st October, 1938.—It's on. The 1938 VK-ZL. Pandemonium!

At 1200 G.M.T. Saturday, 1st October, 1938, it appeared as though every station in Australia and New Zealand was on the air endeavouring to contact the rest of the world. The long awaited 1938 VK-ZL, organised and controlled by the New South Wales Division of the Wireless Institute of Australia, in co-operation with the N.Z.A.R.T., was on and well under way.

1938 was the first time that the Contest had received Government recognition, and the Contest Committee were enabled to devote considerable time and money towards making known the rules.

The contest was an unqualified success, and from all parts of the globe came letters of congratulation and thanks. In VK-ZL, in both the Senior and Junior Sections, entries were almost double those of 1937, and there was a large increase in the number of entrants from overseas.

In each section of the Contest there were three trophies to be won, in addition to certificates for high scoring stations.

Firstly, for that station outside VK-ZL who obtained the highest score. This trophy has been won by W. M. Atkins, W9TJ, with a score of 19,740 obtained from 118 contacts on three bands in 28 districts. W9TJ is closely followed by Dale Schulyer,

W6KRI, who scored 19,376 from 120 contacts on three bands in 28 districts. Although these two stations only had a difference of two contacts. W9TJ's contacts covered a greater number of stations in each district. Other fine scores were those of W5WG, 17,334; W6OEG, 14,856; K6CGK, 14,508; VR4AD, 12,308; and J2JJ, 9,398.

Second trophy was for the highest scoring VK-ZL station, and that has been won by C. Wilier, VK2ADE, with a score of 91,300 points obtained from 205 contacts on two bands and a multiplier of 55. S. Gibbs, ZL1DV, with a score of 67,940 obtained from 205 contacts on two bands and a multiplier of 43, was second, whilst another ZL in the shape of ZL2QA, A. Bailey, was third was 64,974.

Third trophy was for competition between the districts of Australia and New Zealand, and was won by N.S.W. with a score of 258,551 points, followed by Queensland with 187,514, and the New Zealand Second District with 127,093. VK2's points were made up as follows:—VK2ADE, 91,300; VK2HF, 62,656; VK2TI, 35,002; VK2RA, 32,439; VK2VN, 20,648; VK2EO, 16,506. An effort worthy of special mention was that of D. Duff, VK2EO. 2EO obtained his points from one weekend's operations and using one band only. Well done, Dave!

Every log received was checked and cross checked, and it was found that some competitors did not take advantage of using more than one band, and when they did only counted the different prefixes worked on each band instead of all. If some competitors find their score increased they will now know the reason!

Rules 12 and 13 were strictly enforced by the Contest Committee, and where any log showed a T6 report it was very thoroughly checked, and if this poor note was followed by T7's

and TS's the entrant was disqualified. A close watch was also kept on the band edges. The list of disqualifications at the end of the results is the outcome of the enforcement of these rules.

In the Junior Section three trophies were available for competition under the same headings as in the Senior Section.

The first trophy was won by B. Chapman, VR4BA, located in the British Solomon Islands, with a score of 8656 obtained from 82 contacts on two bands in 16 districts. A really good effort was that of G6XL, who scored 3340 points from 36 contacts in 10 districts, and using two bands.

Second trophy was won by W. G. Collett, ZL4BP, with a score of 27,118 points, followed by R. Beatson, VK4BB, 24,660; and A. Frame, ZL4GA, 17,461.

Third trophy was won by Victoria with a score of 45,083 points, very closely followed by Otago District of New Zealand with 44,579. Teamwork won the day here for VK3, as Otago's points were scored by two entrants only, ZL4BP and ZL4GA.

The Junior Section of the contest was inaugurated to enable the low power man to have his fun. Unfortunately quite a number of entrants were under the impression that no filter was required.

The Contest Committee would like to thank all those Societies who offered co-operation in publishing the rules of the contest and also collected and checked logs, and last, but not least, the competitors who helped make the 1938 VK-ZL the Contest of Contests.

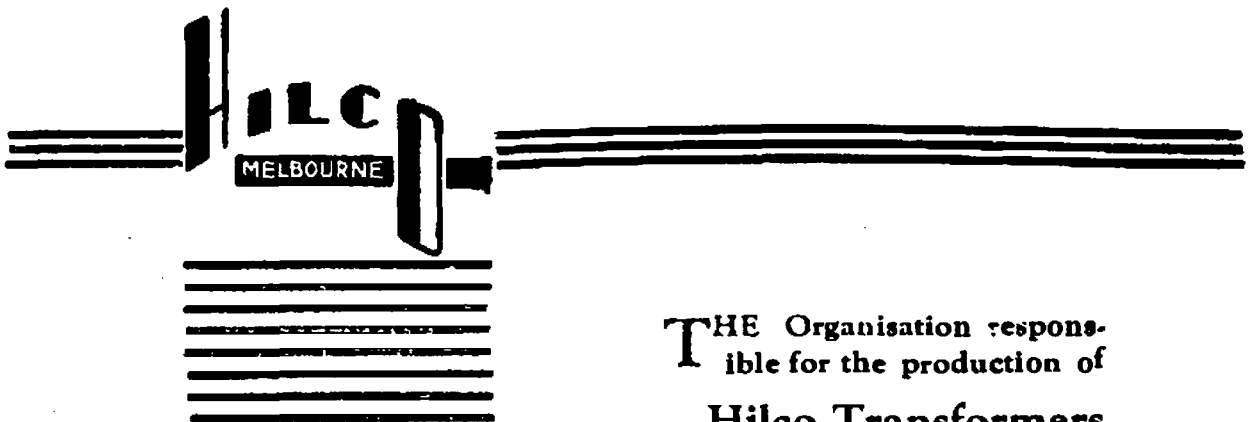
### SENIOR SECTION.

#### Section 1.—Amateurs in Australia and New Zealand.

First column denotes number of contacts; second, number of different countries; third, multiplier; fourth, number of bands used; and lastly, points scored.

#### New South Wales.

VK2ADE	...	205	54	55	2	91,300
VK2HF	...	166	39	44	3	62,656
VK2TI	...	109	31	37	3	35,002
VK2RA	...	117	26	33	3	32,439
VK2VN	...	63	29	32	3	20,648
VK2EO	...	87	21	21	1	16,506
VK2DA	...	99	18	18	1	14,652



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VK2VA	70	15	15	1	10,170
VK2AV	73	14	14	1	10,080
VK2EG	50	18	18	1	9,900
VK2AJU	41	14	14	1	6,496
VK2UF	54	10	11	2	5,379
VK2CP	45	10	11	2	4,983
VK2SS	46	11	11	1	4,972
VK3AJK	39	10	11	2	4,653
VK2WA	50	9	9	1	4,455
VK2WH	30	11	11	1	3,784
VK2OE	17	13	13	1	2,613
VK2RB	25	9	9	1	2,547
VK2AFM	14	9	10	2	1,660
VK2AJF	15	13	13	1	2,327
VK2YC	13	10	10	1	1,540
VK2NP	15	5	5	1	815
VK2AHM	19	3	3	1	624
VK2BY	15	3	4	2	600
VK2TJ	21	3	3	1	519
VK2AIK	17	3	3	1	465
VK2ZJ	9	3	3	1	321
VK2PX	6	3	3	1	191
VK2FX	6	3	3	1	177
VK2AHI	4	2	2	1	94
VK2KJ	3	1	1	1	36

### South Australia.

VK5FM	74	18	18	1	13,302
VK5FL	84	12	12	1	9,300
VK5LD	54	11	11	1	5,797
VK5JS	23	12	12	1	3,384
VK5IT	23	9	9	1	1,962
VK5LL	13	3	4	2	556
VK5LG	15	3	3	1	519
VK5HM	13	3	3	1	450
VK5JT	7	4	5	2	252

### Victoria.

VK3KX	90	30	31	2	30,426
VK3HG	93	18	20	2	15,300
VK3WL	69	17	20	2	13,940
VK3VF	56	14	14	1	8,414
VK3EH	94	10	12	2	8,356
VK3NG	32	11	11	1	3,680
VK3TS	35	8	8	1	2,944
VK3XB	49	4	5	2	2,004
VK3RJ	30	6	6	1	1,920
VK3BV	34	5	5	1	1,720
VK3EQ	13	10	10	1	1,550
VK3CX	17	6	6	1	1,032
VK3DJ	14	5	5	1	815
VK3BG	17	3	3	1	537
VK3JA	11	3	3	1	375
VK3JE	8	3	4	2	372
VK3OI	12	2	2	1	272
VK3CT	5	4	4	1	240
VK3FV	5	2	2	1	120
VK3KC	3	3	3	1	108
VK3ZC	2	2	2	1	48

### Queensland.

VK4JX	177	39	41	2	60,437
VK4BB	115	40	49	4	56,252
VK4AP	100	25	25	1	24,575
VK4UL	109	22	22	1	21,670

VK4JR	67	24	24	1	17,496
VK4SA	47	14	14	1	7,084
VK4AW	41	14	16	2	6,720
VK4SD	17	2	2	1	356
VK4RY	6	4	4	1	284
VK4LT	9	2	2	1	208
VK4JU	—Check.				

### Western Australia.

VK6AF	80	21	24	2	18,864
VK6MW	78	18	20	2	13,040
VK6FL	61	19	21	2	12,420
VK6SA	57	14	20	2	9,360
VK6LJ	50	13	14	2	7,336
VK6MN	15	11	13	2	2,613
VK6MU	5	3	3	1	210

### Tasmania.

VK7JB	36	11	11	1	5,082
VK7LZ	36	11	11	1	4,875

### New Zealand, ZL1.

ZL1DV	205	42	43	2	67,940
ZL1BT	84	20	21	2	15,183
ZL1BR	46	17	17	1	7,854
ZL1HY	34	15	13	2	5,445
ZL1FE	40	11	11	1	4,554
ZL1KE	28	5	5	1	1,385
ZL1CH	8	6	6	1	576
ZL1MR	4	4	3	2	192

ZL1FT—Check.

### New Zealand, ZL2.

ZL2QA	191	40	42	2	64,974
ZL2GN	179	31	32	2	42,720
ZL2GW	88	19	19	1	15,219
ZL2MM	56	10	10	1	3,020
ZL2AI	16	8	8	1	1,160

ZL2OU—Check.

### New Zealand, ZL3.

ZL3AZ	107	29	29	1	30,160
ZL3GU	71	20	20	1	14,500
ZL2AY	24	4	5	2	1,180
ZL3GR	15	4	2	1	648

### New Zealand, ZL4.

ZL4DQ	181	40	42	2	62,832
ZL4BR	108	13	15	2	12,825
ZL4GY	39	11	11	1	4,620
ZL4AC	23	6	6	1	1,446

### Trophy Point Scores.

#### VK-ZL.

VK2ADE	91,300
ZL1DV	67,940
ZL2QA	64,974
ZL4DQ	62,832
VK2HF	62,656
VK4JX	60,437
VK4BB	56,252
ZL2GN	42,720
VK2T1	35,002
VK2RA	32,439

#### Teams of Six from each District.

VK2	258,551
VK4	187,514
ZL2	127,093
ZL1	102,361

# Amateur Radio

ZL4	81,723
VK3	79,116
VK6	63,631
ZL3	46,488
VK5	34,301
VK7	9,957

## JUNIOR CONTEST.

### VK2.

VK2IG	40	21	21	1	8,925
VK2AJK	31	15	15	1	5,265
VK2AFJ	22	12	12	1	3,120
VK2TI	16	10	11	2	1,850
VK2YC	11	11	11	1	1,452
VK2QL	10	8	8	1	952
VK2RB	11	1	7	1	903
VK2AJU	10	6	6	1	642
VK2KJ	5	3	3	1	108
VK2AFM	1	1	1	1	12
VK2JX—Check.					
VK2AHI—Check.					

### VK3.

VK3XU	60	24	24	1	15,536
VK3HK	70	18	20	3	13,980
VK3IG	43	15	15	1	7,125
VK3XB	45	8	10	2	4,160
VK3HG	23	10	14	2	3,752
VK3RJ	9	5	5	1	530
VK3BG	6	2	2	1	72
VK3WL—Check.					
VK3QK—Check.					
VK3QV—Check.					

### VK4.

VK4BB	75	27	30	2	24,660
VK4SA	39	18	18	1	8,118
VK4AP	22	12	12	1	3,444
VK4LT	18	9	9	1	1,908
VK4JB—Check.					

### VK5.

VK5JT	15	10	10	1	1,710
VK5JS	12	10	10	1	1,430
VK5LY	9	8	8	1	856
VK5TX	4	4	4	1	192
VK5LG	4	3	3	1	144
VK5IT—Check.					

### VK6.

VK6AF	40	11	13	2	5,538
VK6NL	17	9	9	1	1,719
VK6LJ	14	8	8	1	1,312
VK6MW	7	5	6	2	492

### VK7.

VK7YL	12	8	8	1	1,128
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### ZL1.

ZL1GX—Check.

### ZL2.

ZL2HR	14	5	6	2	924
ZL2OU—Check.					
ZL2GW—Check.					

### ZL3.

ZL3AZ—Check.

### ZL4.

ZL4BP	119	21	26	3	27,118
ZL4GA	98	18	19	2	17,461

### Trophy Point Scores.

#### Foreign.

VR4BA	8,656
G6XL	3,340
W6QAP	3,012
VU2EU	2,904
W...PFO	2,660
PKIBX	2,565
D4AFF	2,563

#### VK-ZL Amateurs.

ZL4BP	27,118
VK4BB	24,660
ZL4GA	17,461
VK3XU	15,536
VK3HK	13,980

#### VK-ZL Districts.

VK3	45,083
ZL4	44,579
VK4	38,130
VK2	21,564
VK6	9,061
VK5	4,332
VK7	1,128
ZL2	924

### RECEIVING SECTION.

#### VK.

VK3-ERS	135,521
BERS-195	58,539
A. Stowar	28,766
D. Robson	27,468
R. Tester	2,2626

#### ZL.

ZL-166	34,128
ZL-420	7,781
ZL-419	1,080

### DUNNINGHAM MEMORIAL

#### TROPHY.

	C'tacts.	C'tries.	Pts.
VK2DG	735	64	47,040
VK3MK	432	48	20,736
ZL1BR	185	56	10,370
ZL1MR	165	46	7,590
VK4JU	185	40	7,400
VK4JP	173	37	6,401
VK5LL	111	18	1,998
VK5PS	123	16	1,958
VK2KJ	95	18	1,710
VK2CS	39	12	464
VK3HG	22	13	286
ZL4FB	26	8	286
VK3CX	163	37	6,031
ZL3JA	124	40	5,960
VK2TI	18	12	216
VK2AFJ	18	10	180
ZL1CH	10	5	50
VK4AW	15	3	45
VK2RA	6	5	30
VK5LG	5	2	10

## 28 and 56 M.C. Notes

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(By A. Pritchard, VK3CP.)

We have seen another contest come and go, so that ten metres is starting to settle down once more to the usual experimental side of things. The cw section received good support on this band, and the phones had an absolute harvest judging by the number of W's on the job. VK3XP did very well with around 185 and 11 districts on 10. The first Sunday morning seemed to have the best conditions, and 50 were contacted here at 3CP in the three hours commencing 9.45 a.m. VK3EH often had a band full calling him, so evidently he has a nice score. No VK5's or 6's were heard called, although the following VK's were piling them up—2ADT, 2ALU, 2IQ, 2US, 2GU, 3XJ, 3EH, 3CZ, 3XP, 3BQ, 3KX, 4AW and 4JP. All helped to give those great numbers of W's their necessary DX. Afted the cw tests were finished the cw portion seemed dead and deserted, but not so with the phones; they seemed to keep going, hi! XE1A at 7.30 a.m. had r7 phone and XE2FY at 9a.m. was r8. J3FZ had powerful phone practically all the morning, also PK1VY was r7 around 1.30 a.m. Incidentally, I was told by W9WIP that XE1A had 1303 contacts on 10 and 20, which really gives a score! It is interesting to note the different countries that took part, and the following list gives prominent ones, judging by the numbers calling them: — CE5DX, LU5AN, HC1PZ, VP1WB, CX2CO, HK3CG, J2KN, XU8AM, VO7VP, PK2WL, PY2AC. With more VK's on 10, there would be more scope for these fellows, and perhaps they would turn their beams our way more often—who knows? VK3XP has the 3 element beam fixed on his trellis tower, and it certainly looks well and works well. Ordinary steel conduit was used with a sleeve soldered over the joins (it can't be bought long enough in the one piece) and painted like the rest. The best way of rotating has not been decided upon yet,

I believe. VK3BQ has changed his QRA, and before dismantling the gear an 809 was tried in the regenerative 10 mx doubler against an 801. To give the same grid mills in the 50T final, it needed a plate current in the doubler of 55 mills for the 809 and 100 mills for the 801, showing how superior is the 809. VK3YT and 3TT were here from Ballarat a few weeks back, and hearing the conditions were very enthusiastic for future 10 mx work. 3YT is putting a xtal controlled rig on 5 mx in the near future, which will be eagerly looked for by the Melbourne gang—more news later. 3XP reports a good contact with VU2AN, who was using 10 watts into a 6L6 on the 12th March last. It is with pleasure I can say that 3YP is practically ready to be on the air again—one of the reasons—rebuilding! There is practically no dope on experiments. The contest took all the time. Easter Monday showed a marked improvement in conditions with an absolutely full band all the morning, and the W phones were readable until 3 p.m. At 1.54 p.m., ZL1GZ, using his new three element beam, was heard working VK4VJ and had excellent signals here. The craze for those three element beams has hit ZL by storm, and ZL1GZ has made a job of it by using five-eight copper tubing. At 5.30 p.m. that afternoon the band was behaving most peculiarly, and showed a dozen J. Comm. harmonics as well as VK4VJ and VK4KA, both r6 phone, 20 metre harmonics, also VK4SA and VK6IG, CW harmonics from twenty. A number of the W's have now modified their three element beams by using one-quarter wave spacing so as to raise the eight ohms impedance at the centre to a more reasonable figure, thereby enabling them to utilise their popular concentric feeders.



## DX Notes

(By VK3MR.)

Notes on the doings this month are very scarce. Perhaps it may be due to the after effects of the ARRL contests. No activity reported from the fone men! What's happened to him? I will be on the job myself very soon (what again, Ed.), but I have to install several wave traps in the aerials of the prisoners in the nearby Pentridge who are complaining bitterly of blanketing from my signals. They use snappy xtal receivers built in match boxes (dinkum, Ed., they do). Did you see Bill Moore's (2HZ) foto in QST last month? What a man! Bill has been wasting hard earned RF chasing a pirate using the call of AC4YN. The station using this call and with a T7 or less note is not the real AC4YN, who always uses xtal control. This was disclosed in a letter from him to 2AGJ. 2HZ has now worked 100 countries (who said about time). He pleads guilty to using ECO. Shame on you Bill.

It is with great pleasure that I mention the return to 14280 kc of VP5PZ, who is well known for his good operating. John has been inactive for a few years. Look at these and weep, AO, NY, K4, YM, VP5, VP1, OH, U, YL and VP7. What a hat for the week. Sounds like the work of some gro merchant you might think, but no, its all done on 5 watts by Jeff VK2AHM. What does he use? Vee beams is the secret, the whole secret, too. Jeff has been plugging along with qrp, also 4 watts fone and has now worked 44 countries on cw. He has WAC'd four times now and does most of his work during the daytime and works on ten as well. Good work, om. Let's have some more dope before the 17th of each month.

2DG in between service jobs is still going strong. Fallen into the habit of winning more and still more dx contests. The latest is the "Dunniugton" Trophy. He also is the first VK2 to qualify for the DX Centenary Club. His number is 112 on the list dated 7th March. Some juicy ones worked by this young fellow-me-lad are HC9BR, 14155 kc at

1630; HI7G, 14030 kc, 2200; OA4AI, 14055 kc, 2200; CE3AA, 14050 kc, also 2200; and CE1AH, 14055 kc at 2130, and on fone too! How could you Keith! On cw his list is no less imposing. CX1CG, 14350 kc, 2230; CX1CX, 14210 kc, 2200; LU3HK, 14295 kc, 2130; VP9K, 14330 kc, 1700; and VP7NT, 14400 kc, 1700.

I understand that 2ADE is again the winner of the October contest. Congrats OM. I would like a few scores from the ARRL tests as it will help to lessen the great suspense felt by many competitors waiting for the final results. VK4GK and 4BB have both been awarded the B.E.R.T.A. on the 14th February. One has to work at least 25 out of the possible 27 British Dominion districts. Full list next month. I had the pleasure of meeting 4AW, 4RY, 2DA, 2YC and 7HM over the Easter holidays and what scandal! 73 to all. Keep sober.

## Federal and Victorian QSL Bureau

(R. E. Jones, VK3RJ, QSL Manager)

VK listeners have advised that the Wireless Branch has requested listeners not to use calls commencing withn VK.

Two recent call books in good condition are available at this bureau, the price being 4/- each posted. First in gets them.

F. W. Allen, W8GER, 324 Richmond avenue, Dayton, Ohio, U.S.A., who is QSL manager for the 8th district of U.S.A., is an ardent stamp collector and requests that when despatches of cards are forwarded to him that different varieties of stamps be used.

K4FCV, Ramon M. Marti, of Box 3783 Santurce, Porto Rico, has frequently had his call sign read by dx as VK4FC and Ramon has lost many needed cards thereby. A thorough search of the Federal and VK4 bureau has failed to discover any of the cards.

Madame la Baronne Bonaert de la Roche-Marchiennes, the widow of the late Baron, ON4HM, has graciously

(Continued on page 27.)

## Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 15th of the month preceding publication.

### N.S.W. Division

#### Zone 5 Notes (By VK2IG.)

Activity in this zone has fallen off considerably, but judging by the amount of reconstruction going on, there is surely going to be the need of some super selective supers.

VK2EU.—Is putting the finishing touches to his new speech amplifier, which in turn put the finishing touches on his bank account. It promises to be a swell job tho.

VK2OJ.—Again busy with antennas with varying luck. Hard to check on them just now with condx all cranky.

VK2AP and VK2QE.—Very quiet, but probably planning trouble for the rest of the gang.

VK2IG.—Getting some new DX at times, and using new antenna which gets to U.S.A. at any old time!! Don't they all- Cards to hand from FT4 es ZC6.

VK2AID.—Now transferred to Corowa, we think, after a super send off at VK2AEO s. Reports indicate that the send-offers were not sure just how many were at the party, 16 or 32. Hi!

VK2AEO.—Still at Wagga, and working the DX to some order. Now has 57 countries for eight months and no contests. Included in his list are TF, FU8, FI8, VR1, VR4, YR, LA, VQ2, VP5, VP4, I, CR7, XZ, EI, HB, CT1, and CT6C, who is on a ship some place. That's nice work Pol om.

#### Border DX Notes (By VK2IG.)

DX has certainly been a changeable thing here this month, and some good countries have been work-

ed. Better ones heard and missed, hi! Also at odd times DX has been worked such at PK1TM at around 10 a.m. and W8's at all sort of times during the mornings. Last year VK2QE worked a W at 10.30 a.m. South Africa has been contacted during the afternoons, as has some of the Northern Africans. A rare one for the gang's notice or perhaps the R.I. is ZK9RP. We missed him so no QRA available. Also heard, but not Qso'd are YL2BZ on 14270 and YL2AB on 14270. Reported from VK2AEO are FM8AD, who is still calling Asia, and FA8AA who is on 14280. K6PMP is on Guam and not using the new prefix. CR7AU on 14300 is on around midnight. Here at 2IG we have contacted a few new countries as follows: OA4R on various freqs. and on 14400; I1IR on 14000 c. is at r8 when coming thru. Also I1IT on 13990. I1IR came on and called 2IG to tell him to finish off with I1IT for a qso, hi! LU6DJK is on 14280 most nights. CE3BF consistently on 14410 and a fb contact. He is also a stamp collector. LY1AH on 14360 and CT1JS on 14410 pretty regularly at night. VP6MY on 14090 is T9 at around 9 p.m. VP4TF 14300 and VP4TI on 14345 about the same time. VQ5HJP during the afternoons, but not on much. Among the rare ones we put YT7TE on 14400 or perhaps f4405. Also ZK9RP, 14395. LX1MB on 14415 is an easy one to raise. ES1E on 14360 though not so rare is not heard very often, and is a new one to many. VP5PZ still going strong and when qso'd here after calling him for weeks, said he was sorry for all the calls as he had often heard us at r8. Fb!! Particularly as we spent hours calling and also hours changing the antenna all round the yard in an effort to contact him!

## Victorian Division

### Key Section Notes

(By 3OC.)

What with one thing and another, your correspondent has been in a bit of a daze this month—a state which some of the less well informed may think natural. However, I deny it categorically, and attribute the cause, directly and indirectly, to radio. First of all, as most of you know, your unworthy scribe, in conjunction with his partner in crime, WG, was instrumental in staging a couple of stupendous, gigantic and colossal auction sales at the March Phone Section and April Key Section meetings, reverberations of which are only now fading away. Your correspondent has been reduced to the state of having to wear a false beard and creep furtively down back lanes for fear of being violently accosted by some citizen alleging that he was sold, for the sum of sixpence, a power transformer with a burnt out primary, or a squimduffit with no markings on it.

Under these harrowing circumstances it will be apparent to my two readers that it has been impossible to collect any data as to the individual doings of the boys. We can only assume that they are agitating the ether with more or less successful results, and that some of the condensers they purchased were not punctured, and are doing their duty in bringing the hitherto T8 signals up to an immaculate T9.

Outstanding events for the month as far as the Institute was concerned were the Convention and the annual dinner. Some details as to the results of the Convention will probably be given elsewhere in this issue, and as to the results of the dinner—well, they should have all been shaken off by this time. One story that came to your correspondent's ears concerned one of the boys who had dined rather well, and was driving a few friends home. He did not appear to be seeing things too well, so one of his passengers suggested that he take the wheel. "Good Grashus," said the fellow, "Don't tell me I wash driving thish car!" Well, that's

how it is, and if you have heard the story before, at least it's a good one.

Owing to the Easter vacation, there was not such a good rally at the dinner as might have been expected. A note of gloom was thrown on proceedings by the speech of Mr. Malone, who did not paint a very rosy picture of the future of Amateur Radio, but the warning was timely, and it behoves us now to put our own house in order so that we shall be in a position to meet whatever comes along.

At the dinner your correspondent found himself at a table in the immediate vicinity of IW (of kitchen stove receiver fame), CX, RX, MR and AG, and whether it was the musical sounds of these boys eating soup, or some other cause which induced a somnolent state, the fact remains that he was brought back to the world by RX propounding the merits of a receiver dial which he has invented. The idea seemed to be to provide rubber buffers at each end of said dial, so that when it had been swung over the band once it hit the buffers and swung through again on the rebound, making it impossible to miss a station calling. The idea will probably be incorporated in RX's new receiver.

Information has just been received from the florist that owing to the non-payment of recent accounts and advent of winter, supplies of orchids have been permanently cut off, so your correspondent will be unable to present the usual monthly bunch of these blooms to the deserving. Enquiries at the local brickworks were more encouraging, and in future brickbats will be hurled with great abandon at those eligible to receive same. One is already winging its way towards the head of the owner of a 14mc phone station, who has been heard on at least three occasions lately asking for somebody's handle.

At long last your correspondent has completed the construction of an audio amplifier. Finishing up with 45's in push pull it sounds pretty good, and on expounding its merits to the wife and pointing out how wonderful it was to think that on coupling it to the SW receiver and turning the switch London would

# Amateur Radio

come booming in, the reply was to the effect that considering it was built for this purpose there was nothing amazing about it, and in her opinion it would only be considered amazing if on turning the switch pound notes issued forth from the speaker. I agree!

## Monthly Meeting Phone Section: (By 3OB.)

Last Tuesday in month.

Good attendance at meeting on 28/3/39. With lecture by VK3KU on inductances and capacities for various wave lengths, and an auction sale of gear, the gang had a wonderful night. Quite a lot of good apparatus was sold very cheaply, and naturally hams got some excellent bargains.

### 200 Metres.

3AM—Usual quality on 200.

3DH—Off air for month. Married.

Congrats.

3GK—Excellent if you don't "mess

about."

3PA.—Quiet. What's wrong?

3FL.—Usual high class transmission and recordings.

3CB.—Usual activity and snappy records.

3LN.—Still making himself known.

3HK.—Alone at Mitcham; usual standard.

3RI.—Big noise around Melbourne, and excellent.

3BY.—Still going strong.

40-20.

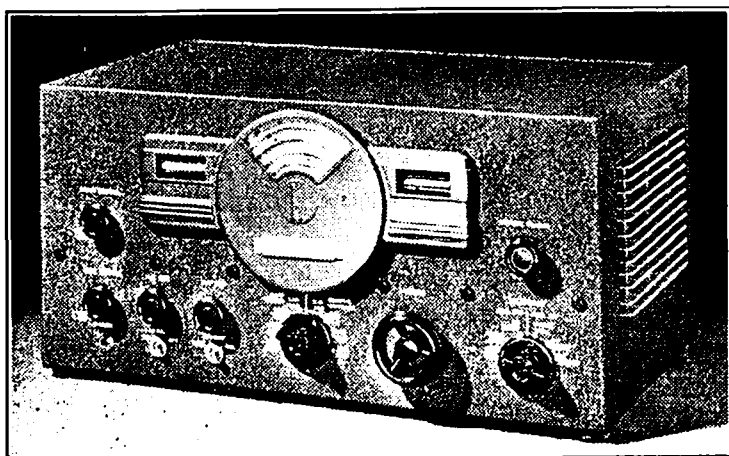
3SO.—Quiet for a while, rebuilding new 7 tube receiver.

3IW.—Active on 20 and 10 fone and c.w.

3EX.—Interest in fone. Your carrier changes frequency occasionally. Om. Why?

3IK.—Fone on 80 bad, too much feedback, fb on 40 now.

3KM.—Bought a lot of junk recently. Fone shortly, Harry?



## Experimenters Operators Listeners!

BUY A  
**Hallicrafters**  
(U.S.A.)  
**SKYRIDER**  
COMMUNICATION  
RECEIVER

**NEW.—SKYRIDER 23**, 11 tubes, 8 bands covering from 8.8 to 556 metres, crystal filter, audio output 5 watts.

**SKY BUDDY**, 6 tubes, tunes from 10 to 550 metres, built-in speaker.

**SKY CHAMPION**, 8 tubes, 7 to 550 metres, built-in speaker.

**CHALLENGER II**, 9 tubes, 7 to 550 metres, crystal filter.

**SUPER SKYRIDER SX 16**, 11 tubes, 5 to 550 metres, crystal filter. separate 12In. dynamic speaker.

**SPECIAL SUPER SKYRIDER, SX17**, 13 tubes, 5 to 550 metres. 2 stages pre-selection, crystal filter.

**ULTRA SKYRIDER** (tunes in 5 metre stations with same ease as lower frequency signals), 10 metal tubes, tunes 3.75 to 53 metres, direct dial calibrations, unique band spread system, iron core expanding I.F. trans., single signal crystal control.

**THE SKYRIDER 5-10**, 8 tubes, built-in speaker, RK1851 stage of pre-selection, covers 27 MC to 68 MC in two bands.

**SKYRIDER MARINE**, 8 tubes, built-in speaker, covers from 16 to 2,150 metres.

**SKYRIDER DIVERSITY**, 25 tubes, covers from 62 mc to 545 kc.

All models have universal transformer 110/250 volts AC (only exception is the Marine, which is 110 volts AC/DC only).

**NEW MODEL HT 6 TRANSMITTER**, 5 to 160 metres, crystal controlled and E.C. 25 watts fone or C.W.

Also **MARINE TRANSMITTER-RECEIVER**. Some **SKYRIDERS** on hand for immediate delivery.

**PARTICULARS FROM AUSTRALIAN FACTORY AGENT:**

## Kilgariff's Agencies

Box 1015J G.P.O. Adelaide  
South Australia, F2490

This is the last warning, chaps. If you don't send me any more doings of your activities I am not going to waste my time reading your minds.

4AW and 4RY called into the W.I.A. Rooms during April and were welcomed.

## U.H.F. Section

(By 3JO.)

Section meets 3rd Tuesday each month at the W.I.A. Rooms.

### 56 Mc. Schedules.

A few months ago we asked in these notes for details of 56 mc. skeds. To date none have been received, and we once more appeal to the 56 mc. enthusiasts to get going at definite times and with definite transmissions, and before doing so please send in details of your intended schedules. Here is one schedule for a start—Station VK3JO, frequency 58.5 mc., dates, every Sunday; times 1230-1415 and 1700-1745 Melbourne time; antenna, non-directional vertical. These times correspond to the times of transmissions by the few 200 mx hams in Melbourne, and the 56 mc. transmissions will consist of rebroadcasts of these stations.

### VK3 and 7 Heard in ZL.

A letter from Mr. P. A. Morrison, of Wellington, N.Z., was received last month, and he reported having heard some fone and c.w. on 56 mc. on Sunday, 26th February. VK3's were heard, but not identified, and VK7K—was heard calling cq. The times at which these signals were heard corresponds to the times of transmissions, and at Mr. Morrison's suggestion some daily schedules are being arranged, and will be in operation shortly. Suggested times are 1900-2100 Melbourne time, and if anyone is interested and would like to put on some transmissions we would like to hear from you so that we can pass on the information to Mr. Morrison.

### Activity (?)

This month we have to report a newcomer and an old-timer—3PB and 3LG respectively. Although he has not been on the air for more than a few weeks, 3PB has already improved on his original rig, and now uses 6C6, 6V6G, 6L6 and T20 doubler as a final stage. The results are R7/8 here. 3LG is still using the 6A6, 6A6, 6A6, 6A6 com-

bination, but R6/7 here now. Just as we conclude we hear that 3DH has "been and gone and done it," and this section expresses hearty congratulations and all good wishes for the future.

## WESTERN ZONE.

(VK3HG.)

3JA.—Has at long last received his genemotor back from repairs and is on full power again, but has little time to be on the air.

3GA.—Heard on 7mc with nice signal from QRP rig.

3SZ.—Not so active lately; working 3.5 mc mostly.

3TW.—Reported to be bitten with the dx bug again and is on 14 mc for that reason.

3KX.—Still heard occasionally on 14 mc when the Europeans are biting.

3XG.—Not been heard lately. How come, Ben?

3OW.—Working a few W's on 14 mc phone. Contemplating a new receiver to overcome 3HG QRM!

311.—A regular on 7 mc phone now and with quite good quality transmission.

3HG.—Dx as usual. Sent cards away for Century Club, having 76 confirmed.

The Sunday morning hook-up has fallen through in the last few weeks, but it is hoped to get it going again soon, possibly on 3.5 mc now that that band is clearing of static.

## EASTERN ZONE.

(By 3PR.)

The date for the Eastern Zone convention has been definitely fixed for 10th and 11th June and will be held at Sale. This promises to be one of the best conventions yet and an excellent programme is being arranged. A cordial invitation is extended to all to be present.

Unfortunately Thursday nights do not seem to be suitable for our weekly hook up so from 3rd May we will hold the QSO on Wednesday nights on 80 mx at 8 p.m. As many as possible are asked to get on for the hookup so that arrangements can be made for our forthcoming convention.

Now for some personal doings.

VK3DI.—Jim is not very active at present. Service work is keeping him very busy.

VK3QB.—Jack is fairly active on 40 mx cw and working quite a lot of dx.

VK3WE.—Bill still active on 80 mx fone and getting QRP rig going in between times.

VK3SS.—Keith is not very active owing to service work, but puts in a good signal when he gets on.

VK3HZ-XZ.—Nothing has been heard of these boys lately, but strange noises are coming over from 3UL occasionally and it sounds as if some rebuilding is being done over there.

VK3EA.—Haven't heard you for ages, Evan.

VK3PR.—Has built himself a baby super and is very pleased with its performance.

## Queensland Division

(By 4RT.)

On Friday, 31st March, the twelfth annual dinner of the Queensland Division was held on the Roof Garden of the Atcherley Private Hotel. The gathering, which was the largest for several years, was well represented by hams from all walks of life, representatives of the trade, and a large number of radio enthusiasts. The chief guest was the senior radio inspector (Mr. Armstrong).

The president, Mr. A. E. Walz, when presenting his report, referred to the loss of frequencies at Cairo, the tragic death of Ross A. Hull, the work of the Institute, and the R.A.A.F. W/T Reserve. He mentioned the revision of the last mentioned, and pledged the division's support in its future progress.

The presentation of trophies, which was made by the president,

was as follows:—W.I.A. Council trophy: 4FB, first; 4TY, second. W.I.A. Institute trophy: 4HR, first; 4EL, second; special award, 4SN. McKen Gold Cup: 4TY, first; 4HR, second. Cran trophy: 4AW, first; 4UR, second. The president, having won the Can trophy twice in succession, retains same, but has intimated his intention of presenting a similar trophy for competition next year. Pennants were also presented to the minor place getters and the highest scores in the All Band Contest, 4AW, 4JF, and 4RY. Results of other competitions held during the evening were:—Farthest ham present, 4CN; milk drinking contest, 4FJ; lucky number, 4ZX; radio problem, M. Gabriel.

The following officers were elected for the forthcoming year:—President, 4AW, A. E. Walz; secretary, 4HU, G. Hughes; treasurer, 4UU, W. Chitham; five other officers, 4RY, W. Harston, 4RT, R. Thorley, 4ZU, H. McGregor, 4FJ, R. Baxter, 4DY, E. Wright.

The meeting was a huge success and ended too early at 11.30 p.m. Members are reminded that a New Students' Class is commencing at the rooms in Celtic Chambers, so please advise your second ops. The new year promises to be one of progress and assistance; country members are requested to send their suggestions to H.Q. so that the new council may commence duties under favourable conditions.

4AW.—Back from holidays in VIM with 4RY. Hope to see both in harness again.

4JX.—Not heard these days, waiting for contest Jack.

## Note New Address!

Maxwell Howden  
(VK8BQ)

15 Claremont Crescent,  
Canterbury, E.7, Vic.

**XTALS**

• 80mx., Low Drift . . . . . 15/-  
• 40 mx., Thick Cut . . . . . 20/-  
• 20 mx., Thick Cut . . . . . 40/-  
Prices for Special Types on Application  
Immediate Delivery.

## Amateur Radio

4PX.—Encountering a lot of YL QRM. Have to put you in the silent keys with 4RF.

4WT.—Getting used to new QRA, but don't QRM those Europeans too much Willy.

4UR.—Breaking it down a little, Jack, not heard so much lately.

4UL.—Very quiet Paul (work or women), maybe silent key for you also.

4RG.—Heard on the wires and also on the air.

4RC.—Losing plenty of sleep lately, Bob, going for the C.C., but check your antenna system.

4FB.—Joined the ranks of motorists; better get the portable together Fred.

4HR.—Works Yanks on 20 as usual, hopes to do the same on 5 when in new QRA.

4DY.—About to break the silence, when mast decides to stay vertical; call a working B, Eric.

4AP.—Mopping up the dx, what about an order for some QSL's, Alf.

4FJ.—On the look-out for country on 40; our new zone manager.

4TY.—Congrats to you, Norm., a fine station.

4OK.—Putting a nice sig. into VIB, only QRP, I believe.

4CN.—Hope to hear your suppressor sone now Jim; Cribb Island a new country.

4RT is busy sharpening lawnmowers after the recent rains.

### **BUNDABERG ZONE.**

4JJ.—Jim amusing the SWL's with records on 40 mx on Sundays.

4OJ.—New ham. Verdi has a new log book, wants to fill it, so give him a shout.

4HP.—Herb very worried about his super, striking bugs everywhere, better hurry Herb or you will have paid 30/- for nothing.

4XR.—Eric twisting dials up in Bundy at 4BU, going to rebuild with 809 in final.

4XO.—Mark off the air at present, but rebuilding.

Wanted to know.—Blonde 4XR rides to work with everyday 4XO; thinks he will QSY and QRM him.

## **South Australian Division**

Once more the financial year comes to a close. The annual general meet-

ing was held on 19th April. Incidentally it saw the end, in a way, of the old Institute as on this date came into being the new constitution.

Unfortunately the delegate who was to represent VK5 at the Convention was unable to attend and so a proxy had to be appointed. We trust that something of a beneficial nature will result from this year's convention as did of last year's.

A further try-out of the emergency network will eventuate early this month and a bigger muster of gear should result from the enthusiasm of the last, which was quite successful.

At this moment I am unable to announce names comprising the officers for the next year, but no doubt these will be published in next month's issue.

Ten meters has been particularly good most mornings during the last month and quite a number of different countries were audible. Five seems the only band to get recreation these days, but here the only sig. is 5ZU, who plods away hoping that some dx will show up some time. Here's hoping, Maurice.

Well chaps, after over four years of writing these lines I feel that some one else should have the chance to bore you stiff, so these will be the last appearing from my pen. I wish to thank all for bearing with me all this time and trust that my successor will be equal to the strain of carrying on and so I wish him and you all the best of luck for the future.

Thanks a lot.

CLARENCE, H. CASTLE,  
VK5KL.

### **BARKER ZONE.**

(By VK5GW.)

Well chaps, conditions here in Narracoorte are such that I find it impossible to keep in touch with the members of this zone. I have been on the air quite a lot lately, but have heard only one VK5, and his strength was only R3. For this reason I am going to suggest that I be relieved of the zone officer's duties and that someone in a more favourable position be appointed. Most of the reports received this month have been supplied by 5CJ. Many thanks, Colin.

5BN.—Graham appears to have devoted considerably more time to swimming than to radio, but nevertheless has managed to get a single sig. receiver working nicely on 20 mx, and also to blow up 4-48's in P.P.-parallel. This latter achievement has decided him to change to an 809 powered by a rotary convertor.

5TW.—Finds time for a bit of cw work in the afternoons when not on duty at 5SE.

5XR.—Cam has been on from time to time. He receives good reports from Adelaide on his 40 mx telephony.

5BF.—Has recently built a new shack (super de luxe type) and at time of writing has not reappeared on 40 mx, although we understand that he is active on 20 mx.

5YL.—Betty, where art thou? Has the river greater attractions than the ether?

5BG.—Bob is still proving to the whole wide world that he has sufficient audio power to fully modulate his final RF stage.

5CJ.—On 40 mx regularly with 6A6-89-807 rig. A portable emergency rig is being constructed which

Colin proposes to power by means of a genemotor.

5GW.—May be changing QRA when the Narracoorte D.C.-A.C. changeover is completed.

## WAKEFIELD ZONE.

Zone Officer "Hobby" unable to write up notes this month owing to having put a hitherto perfectly good index finger (right hand one only) out of order temporarily; can't even write out cheques, as he bitterly complains! Then, quite apart from that misfortune he has heard nothing from his zone members, and his imagination is fast becoming worn threadbare. Also he is working from daylight until dark gathering, or supervising the gathering of the harveston his fruit block. Perhaps in view of such a formidable combination of circumstances we can find it in our hearts to excuse him this time. Remember "Hobby," this must not occur again

LES, 5PN.

## GREY ZONE.

(By VK5LC.)

Well chaps if your call sign does not appear in these notes its because

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## VK3UH

SAME DAY MAIL ORDER SERVICE TO ALL STATES.

CRYSTALS ground from selected Brazilian Quartz and tested to 50 watts input to penthode oscillator as used by leading experimenters and DX stations throughout Australia. Accuracy plus or minus 3 Kcs.

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Plug-in Dust Proof Holders, 7/6 each.

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3-5 Riversdale Road, Camberwell	— — — — —	W1188
97-99 Puckle Street, Moonee Ponds	— — — — —	FU7822

I have heard nothing of you or from you, and I won't appeal again for notes, so from now on if these notes are small and uninteresting you have only yourselves to blame.

5LG.—Leith has been pulling the receiver to bits every two days and has finally finished with det. and 2 audio. He is waiting to see if he is accepted for the R.A.A.F.W.R. This hoy plays golf so radio gets a spell at times.

5HR.—Bill is fit again and on arriving home and looking things over finds things in bad way, batteries shattered, engine and generator badly burnt in places, but the receiver works and the rig looks as though it will go, so you can't keep a good ham down.

5RJ.—Finished rebuilding. Very nice fone, but I don't hear that cw that was supposed to come to light.

5RE.—Re the swap in A.R. notes. Now members, you are witnesses, I will swap. How do you get out of that Hobby?

5GU.—I hear via 5RJ that Bob is steadily rebuilding. He intends using 42 driving 802. Bob would like A.R. to publish an index every six or twelve months.

Had a letter from Frank Trembath of Port Augusta and he says he is still trying to master the code and as soon as he does will have a go at the ticket. Frank wants to meet the gang at W.I.A. meeting.

What does the Grey Zone Gang say to a round up on 80 mx during the winter?

5LC.—Not doing much due to lack of wind and batteries low. So have started on 40 mx. I find that a link coupled vee beam to a receiver reduces generator noise to a very low level.

## Emergency Net

Since the recent disastrous bush-fires an emergency network has been formed, consisting of four sections, located as follows:—North, VK5KL (section leader); South, VK5RK; East, VK5LK; West, VK5HD; stand-by station, VK5ZU, and head control station for network, VK5JT.

It was decided to have a try-out on Sunday, March 19, to see how the network would function under actual working conditions.

Arrangements were made with the National Safety Council to supervise the test.

Mr. Hawke, in charge of the Communications Committee of the N.S.C., took charge, and handed a batch of messages with answers to each station taking part.

The members met at the W.I.A. room at 1.30 p.m., had their photo taken, received their messages and instructions and departed to take up their respective positions by 1.50 p.m.

The network was as follows for the try-out. A central control station with three transmitters was located near Yatala, on the assumption that the officer in control of the fire fighting organisation was located there. One transmitter was on 80 metres, another on 40, and another on 5 metres.

Four mobile outstations were located approximately ten miles north, south, east and west of this central station. They were on 80 metres, and were in charge of the following hams:—North, VK5KL; South, VK5RH; East, VK5DW; West, VK5RI.

The other channel on 40 mx band, worked between Yatala and the head control station at Burnside, VK5JT, who was in touch with the National Safety Council Headquarters by land telephone to pass any messages to and fro. VK5FM and 5TL operated the 40 mx station at Yatala. This channel functioned 100 per cent.

Mr. A. G. Bond, of Bond's Tours, kindly lent his plane for the test. Five metre transceiver was located on this plane, and operated by VK5LX and the 5 metre transmitter at Yatala was operated by VK5LK. The plane flew in a circle around Yatala and at times reached 5000ft., and the test with it was very good, although the operator on plane said that the noise level was very high.

The 80 metre channel with the mobile outstations functioned well, with the exception of the west, VK5RI, who was off frequency, and so was not located or worked. VK5LD was in charge of the 80 metre station at Yatala and did excellent work, handling 17 out and 12 in messages. VK5KL at the north assisted by VK5RT, was 100 per cent., as also was VK5DW, assisted

by VK5RW, VK5XA and VK5CR, at the west section. At the south there was a bit of a hold-up, but eventually VK5RH took over and was 100 per cent.

The following hams assisted in the try-out:—VK5LD, VK5FM, VK5TL, VK5JT, VK5KL, VK5LK, VK5LX, VK5GB, VK5RK, VK5GR, VK5RT, VK5RI, VK5DW, VK5RW, VK5CR, VK5XA, and others.

A notable feature of the test was that VK5FM's station at Yatala was on the air and in communication with Head Control station, VK5JT, 25 minutes after leaving the city.

Some of the gear used was: Single 6Y6G xmtr and single 19 received by VK5FM; single 19 transmitter and single 19 receiver by VK5RW; single 6L6 transmitter by VK5KL. These worked very well. The test was a great experience for members, and they intend to have another very shortly. Maybe an interstate one would be a good idea.

## Tasmanian Division

As the hon. secretary was in Melbourne attending the recent Convention, no meeting of the Southern Zone was held. However, we are expecting a large gathering at the next meeting to hear the results of the Convention.

There are numerous qsl cards on hand for 7CM, KV and DH. It is hoped that we will see these members at the next meeting so they may collect them. Also there are numerous cards for non-members who will receive same upon the receipt of a stamped addressed envelope.

It is hoped that ex 7NG reads these notes as there are stacks of cards here for him and unfortunately we have no forwarding address, so will you please let us have it Roy?

Scandal.

7AG in Gretna is doing some fb work on 40 and 20 mx.

7CT.—Haven't heard the threatened noise on the ether yet, Terry. Too busy with the new job? Believe you have joined the Army signals. Nice work!

7CM.—Despite pretty solid study at the University, is working a lot of dx and VK's. Some of the dx is pretty good hunting. Charlie's num-

ber of countries has risen rapidly during the last two months.

7PA.—Heard quite regularly on the 200 mx band on Sunday mornings. We like the studio clock Peter.

7JB.—Buck, still in VIS, is shocking the Sydney police with his version of the traffic lights and regulations. Owing to excess work has little chance or time to do any radio work.

Hon Secretary "Chum" Moorehouse has just returned from VIM full of new ideas as a result of the Convention. Had an fb time we believe.

7YL.—Hoping to take a few excursions up to 80 mx with a band new rig. Has a brand new xtal which gives an excellent output.

## NORTHERN ZONE.

(By VK7LZ.)

The April meeting of the Northern Zone held at the Y.M.C.A. Launceston was well attended. After all business had been attended to, Mr. Bob Bain, one of our members and a veterinary surgeon attached to the Animal Health Department, Launceston, gave a very interesting lecture which was enjoyed by all.

Advice has been received from our State secretary (Mr. H. Moorehouse) that the Australian Amateurs are to hear some bad news very shortly in regard to the narrowing down of our operating frequencies. With commercial stations and interests working their hardest to get move of our already small bands it is time that the Amateurs themselves realised the necessity of banding together to make the W.I.A. stronger than ever before, both financially and numerically so that we can fight this new menace.

Although we of Tasmania are weaker in numbers than the other States, let us try to show them that we are awake and willing to do our share towards making the W.I.A. the voice of the Amateurs. What say chaps? There are still active experimenters in VK7 who are not members of our division so as a start try to get these non-members to join up with us and explain to them the benefits derived from the Institute, both individually and collectively.

There are also still a few unfinancial members in our zone. What about making an effort to balance the ledger? Remember every little helps.

Our country members are still unheard of as yet and I have arrived at the conclusion that there are no active stations out of Launceston. Remember chaps we can't help you if we don't know your wants or grievances. Read the last two paragraphs over again and don't forget that old saying, "Divided we Fail." What about dropping me a line 7CK or someone. The "doings" of the various amateurs in our zone are as follows:—

7NR.—Heard quite often on 20 metres and has worked a couple of new countries.

7GJ.—Can be heard working dx from about 2 a.m. on any morning.

7BQ.—Very interested in 5 and 10 metres.

7DS.—Still chasing dx and just installed a W8JK beam.

7CJ.—Heard calling CQ on 20 the other night.

7LZ.—The miracle has happened. Just received a W.A.C. certificate predated two years ago.

7LG.—Now on the air again after a long argument about BCL's, etc.

7XL.—At the time of writing is on the boat on his way to Melbourne for a short vacation.

## New Guinea Notes

(By VK9VG.)

With a final blare of "cq contest" we find we are back where we started and to an adding up of scores and pwr bills. Of the VK9 hams, VK9DK was the most consistent on the air during the contest, while your humble fought thru the qrm for a few contacts. Condx up hr were good for about an hr in the afternoon and for about two hrs late at night. With the coming of April the VK and ZL's are not coming in so well and it is a few weeks now since I have had a really good contact on 14 mc with VK. On 7 mc, condx are much brighter for working than they have been for a long time and VK2, 3, 4 have been wrkd hr quite a lot. The 40 metre rag chewers' club is still flourishing and PK6XX is the latest recruit.

9WL.—Back on the air again bigger, brighter and more cheerful than ever. Let's hope you are on to stay this time Laurie oc. Has a new xtal now and is looking for the dx on the low end of the band.

9DK.—Haven't hrd you for a few days Ernie, but hrd someone wrkng you so guess the rig is still going ok. Believe your little alternator has arrived and you are going on to full power. Well oc if your full power means a better sig. the rest of us had better start in now and get in ahead of you. And with an NC100XA receiver on order and a rotary ant. on the "slips." Well, I ask you!

9MC.—Bill gets on to 20 now and then, but can't seem to stick there. Has just bought a new Phillips receiver and tells me that is the first piece of factory built gear he has had in seven years.

9RC.—On the air again, but not so loud as before. Also still a bit of trouble with the receiver. Ron does not trouble the dx much but rag-chews on 40 with the gang.

9BW.—Saw Bill for about ten minutes the other day and he tells me he landed three new ones, EI, LU and HH and already has the crd frm the EI. Latest advice from the rigside is that he is rebuilding (for about the umpteenth time this year).

9RM.—Has now about seven countries on the hook and the walls are getting a few cards on them. Also has a new rx, a SW3, and hopes to get better results with it. The trouble with the old one was that every time anyone slammed a door the sig went and another took its place. The QSL crds have just arrived and Peter is flat out sending them.

9XX.—No news as yet but we still have hopes as it is rumoured Basil is pretty busy.

9GW.—At the new QRA, but not on the air yet. Tells me he has built his house and the "shack" was the first room ready.

9DM.—Not on to the dx yet but puts in an appearance on 40 for a rag chew now and then.

9VG.—Not doing much, but have decided to put the antennas up in the air a bit and a 50 ft. stick is about to be raised with the 8JK,  $\frac{1}{2}$  waves in phase, doublets, etc., on top. Wrkd VP1 with the 8JK 8ft. above ground.

Since starting these notes I have hrd of two new VK9 and wish 9HB and 9NB a cheery welcome to the fold, good luck and plenty of dx when you get started.

(Continued from page 15.)

offered to carry on the QSL activities of her late husband, who endeared himself to all ON hams and rendered great service to the Resau Beige as QSL manager.

A party of scientists are due to leave Adelaide on 25th May to attempt the first crossing through the centre of the Simpson desert. They expect to cross in fourteen days, covering fifteen miles daily. A pedal transmitter is being taken and the operator will be R. A. Simpson, who will work with Harry Ding of Yunta.

Gordon Weynton, VK3XU, enjoyed during Easter week-end a splendid run to the Ovens Valley district, running in a new Oldsmobile on the journey. Is looking forward to the next VK3 country convention which he hopes will be held in Bendigo.

Much pleasure was derived by the writer from a visit by Jim Corbin, VK2YC, QSL manager for VK2, and also that division's delegate to the 1939 Convention held in Melbourne. Jim, although still QSL manager, has delegated most of the duties to his good lady, which is more than the writer has been able to achieve, although some growing youngsters now render much appreciated assistance.

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## VK4UR

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Effecting two way communication with well over 300 American stations in the recent A.R.R.L. DX Contest and getting reports as good as R9 from African stations requires something more than a good station—it takes a nice balance of intensive operating and knowledge of conditions, combined with the use of an aerial system that does its job properly.

The fact that VK4UR has the abovementioned performances to its credit shows that Mr. G. Bates, owner and operator of the station, knows how to make his signals heard throughout the world.

VK4UR, it is interesting to note, graduated from the ranks of the student members of the Institute, and came on the air early in March, 1935. The station does not employ the "high power" which the strength of

the signal locally might lead one to expect—that is, the valves and power supplies are no bigger than are found in hundreds of Australian amateur radio stations.

In the transmitter for 40, 20 and 10 metre operation, a single 801 constitutes the output stage; the plate input is normally 30 to 40 watts, which means that the final valve is worked well within its rating. Preceding the 801 is a link coupled 807 and the oscillator is a 2A5 in the popular tritet arrangement. For 160 and 80 metre operation a separate transmitter is used, employing 2A5 crystal oscillator and 210 power amplifier.

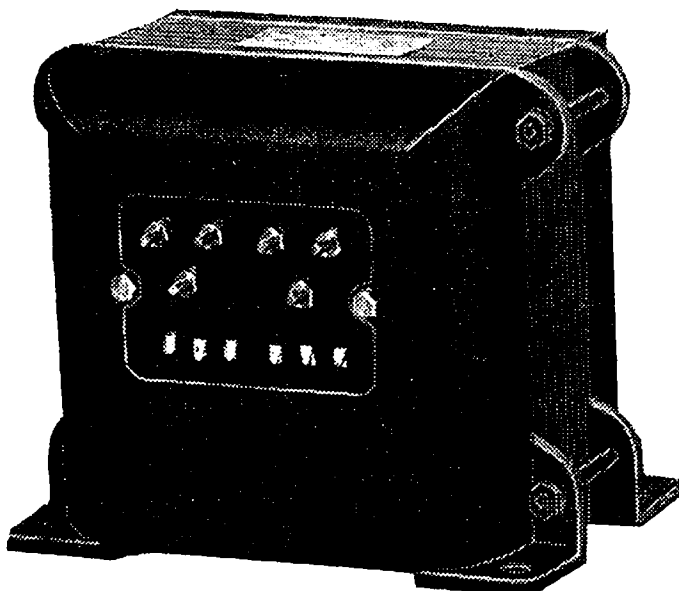
Both transmitters are mounted in a single rack with panels, the lower portion being used for housing the power supplies.

Both transmitters are mounted in a single rack with panels, the lower portion being used for housing the power supplies.

Matched impedance, end fed zeppelin and doublet aerials have been used by VK4UR with varying degrees of success, but the one now in use, two half waves in phase with 51 feeders series tuned, has proved to give by far the best results. On 10 metres a vertical phased aerial is used for both reception and transmission.

The receiver is home-made, and comprises no less than 10 valves in a modern "superhet" circuit. Features which instantly appeal are the crystal filter, the smoothness of the "National" tuning dial, and the pleasing lay-out and appearance of the whole unit. In operation the receiver is a joy to use. Signals from most continents can be heard at any volume desired.

Normal operation of the station is about 75 per cent. in the 20 metre band and 25 per cent. on other bands. C.W. (morse transmission) is used almost exclusively, as Mr. G. Bates has no inclination towards telephony. Two way communication has been established with 67 countries, and the station has made W.A.C. (worked all countries) and WBE (worked British Empire). In the last Fisk Trophy Contest VK4UR filled second place in VK4.



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**F**OR Sale.—350v. 75 M.A. Vibrator Unit, 12v. input, £3/7/6; 180v. 40 M.A. vibrator unit, 6v. input, 35/. Philips TC 03/5-1 triode and socket, 10/-. VK3PR, Lengatha, Vic.

**K**ILGARRIFF'S Agencies, 114 Gawler Place, Adelaide, are the South Australian Representatives for Bright Star Radio.

**M**AST for Sale.—40ft. Oregon, 4in. x 4in., tapering to 3in. x 3in., complete with guys, halyard, etc.,

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**W**ANTED, Jones 1935 and 1936 Radio Handbook. Write stating price to Bert Lutener, Central street, Penshurst, Sydney, N.S.W.

**X**TALS by W9ADN, AT cuts, 3.5 mc, 20/-; 7 mc., 22/6; 14 mc., and filters, prices on application; MOUNTS, American, 8/6; R.F. CHOKES, 10/200 mx., 200 ma, 2/6; 10/200 mx. 500 ma, 5/-, 5 mx, 1/9; BUGS, 50 in use in Telegraph Branch, Melbourne, 35/-, plus postage; KEYS, P.O. Pattern, 14/6, plus postage. VK3RJ, 23 Landale street, Box Hill, Vic.

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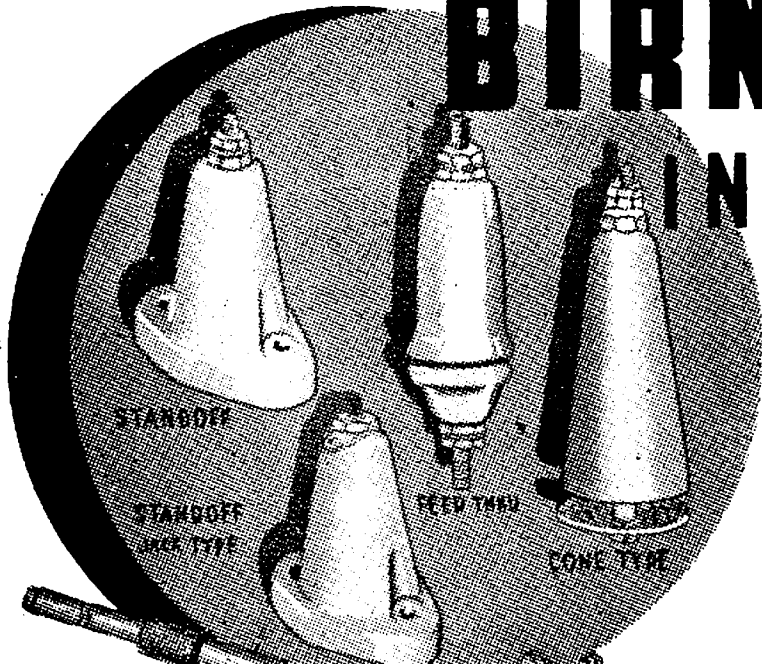
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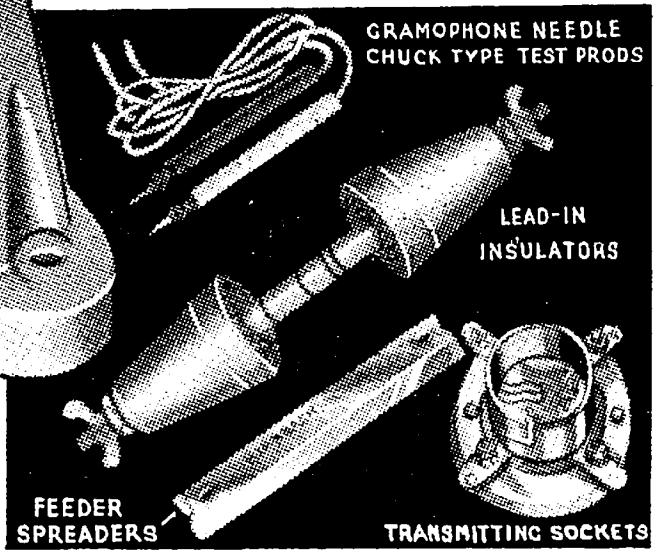
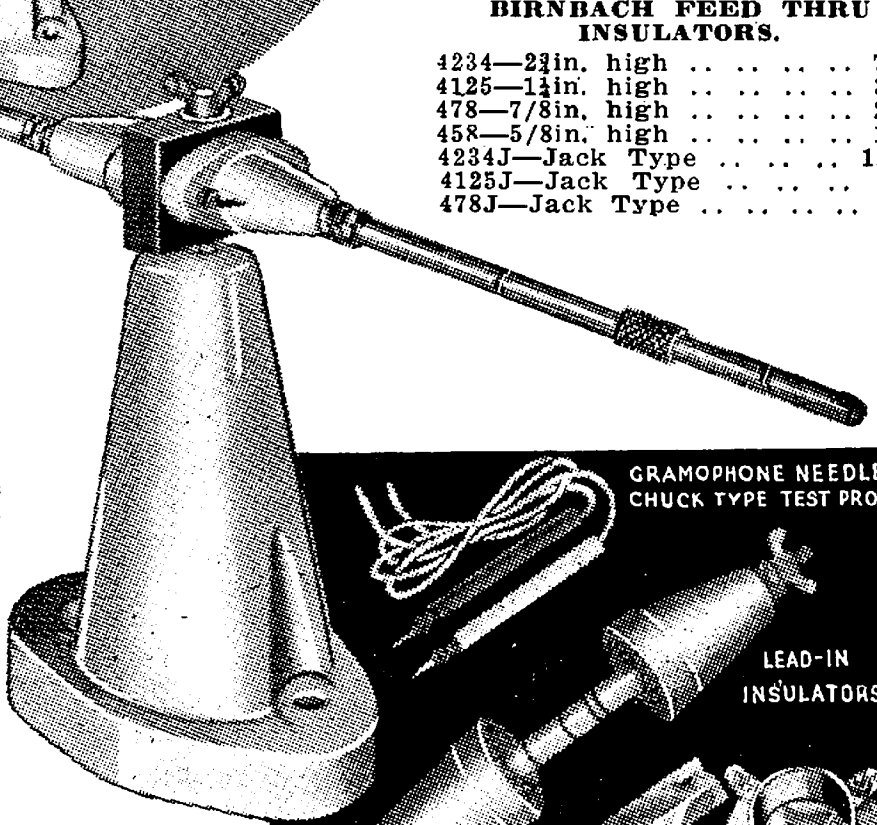
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1st JUNE, 1939.

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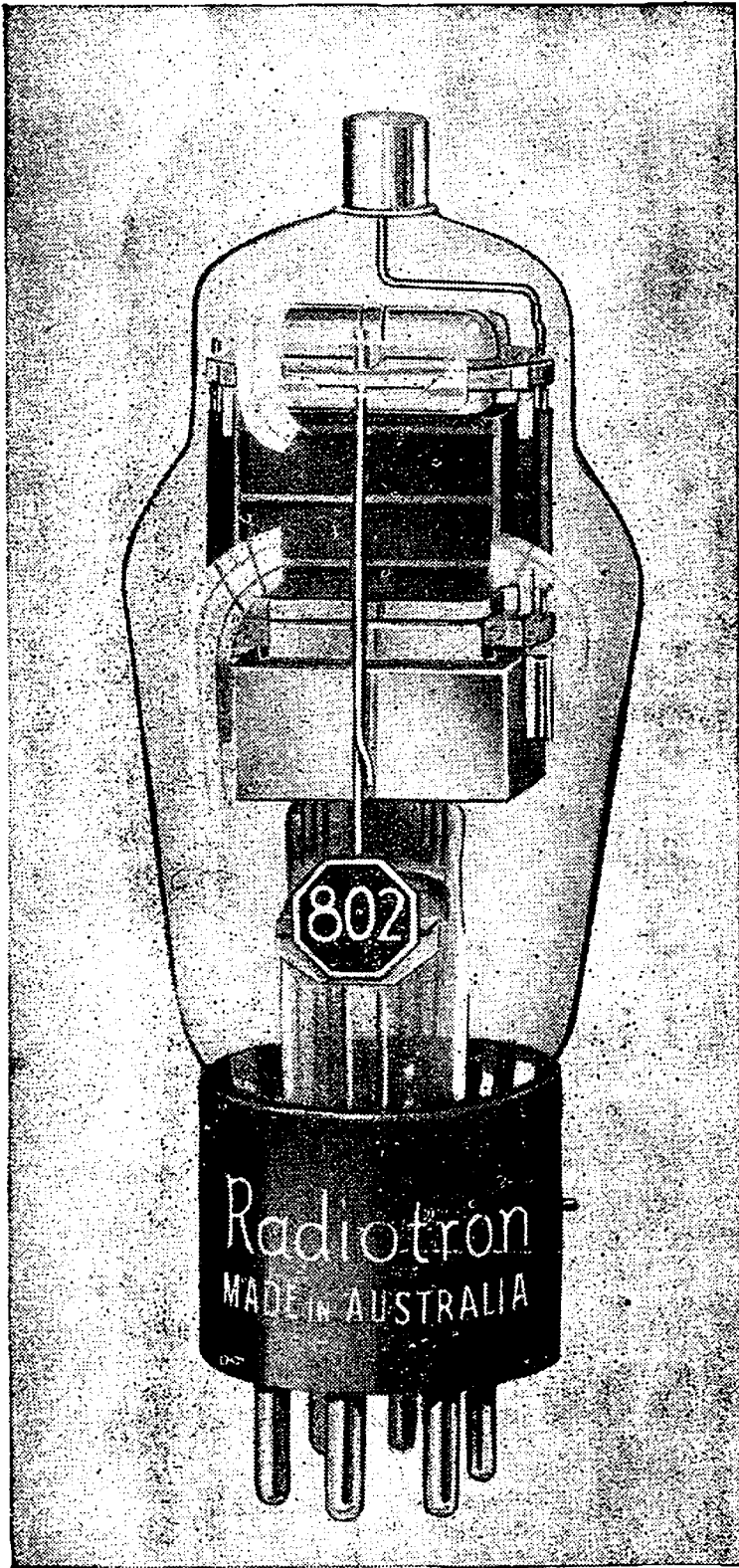
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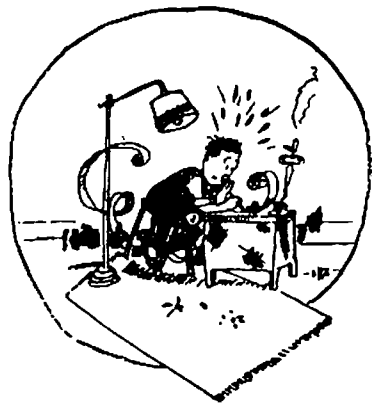
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# EDITORIAL

On the occasion of the installation in office of the Federal councillors and executive by their respective divisions, it would appear an opportune occasion to remind our readers of the responsibilities of these offices. It is obvious from the decisions reached at the Federal Convention held this year that all divisions considered the Federal Council to be the paramount authority in Institute affairs. The Federal Executive, however, has the responsibility of administering the various matters that are decided upon from time to time. The decision reached at the convention to utilise our magazine, *Amateur Radio* as the mouthpiece of the Federal Council will serve to indicate the importance attached to a regular magazine in the progressive life of the Institute. It is intended to use the magazine to keep the Institute generally informed of the progress achieved in Federal organisation and development. Part of the Federal Programme this year includes the co-ordination of general experimentation, and the placing on a firm footing of national emergency organisation in addition to the protection of vital Amateur interests. As the establishment of Federal Executive happily coincides with the location of the central administration of the Wireless Branch a closer and more personal liason will react to the mutual benefit of all.

W. R. GRONOW,  
Federal President.

---

### THIRD PARTY TRAFFIC

One of the most important regulations designed by the Department to protect the revenue received by the authorised communication systems appears to be more frequently broken these days than was the case

years ago. It is strange that some experimenters think that by disguising their calls and thus hiding their identity that they, like the ostrich with its head in the sand, will be passed unobserved.

When obvious third party traffic is being handled from one overseas aircraft station via another station the regulations become more honoured in the breach than the observance.

Apart from being foolish as well as being a breach for which there is no excuse, this handling of third party traffic becomes decidedly dangerous, when one's licence is in jeopardy.

The operator of the originating station is no friend of yours, if he will not understand your polite refusal to take his messages for the simple reason that "You are not allowed to handle third party traffic."

---

### FEDERAL EXECUTIVE, 1939.

Federal Headquarters now being located in Melbourne the following officers have been elected by the Division:—President, Mr. W. R. Gronow (VK3WG); vice-president, Mr. V. E. Marshall (VK3UK); secretary, Mr. J. G. Marsland (VK3NY); publicity officer and treasurer, Mr. R. H. Cunningham (VK3ML); QSL officer and contest manager, Mr. R. E. Jones (VK3RJ). The postal address is Box 2611W, G.P.O., Melbourne.

---

### FEDERAL COUNCILLORS.

N.S.W., Mr. J. Corbin; Victoria, Mr. V. E. Marshall; Queensland, Mr. R. Thorby; West Australia, Mr. K. S. Anderson; Tasmania, Mr. H. M. Moorhouse. No advice has yet been received from South Australia as to their appointee.

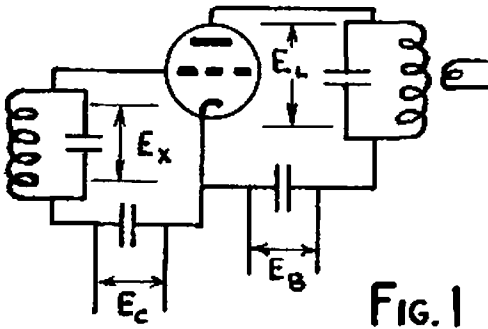
# Modulation in the Plate, Grid or Cathode

(By R. M. Huey, VK3UE ex-VK2HU)

There seem to be three commandments for successful phone operation, namely

- (1) Thou shalt not be un-neutralised.
- (2) Thou shalt not over-excite with excessive R.F. voltage.
- (3) Thou shalt not over-modulate with excessive audio voltage.

This article will deal mainly with the second of these commandments, making reference to plate, grid and cathode types of modulation. Although mainly theoretical in nature,



**FIG. 1**

it is hoped that some of the active phone men may be stirred to experimental verification of the theory presented below. There is a lot of work to be done and published yet on good amateur phone.

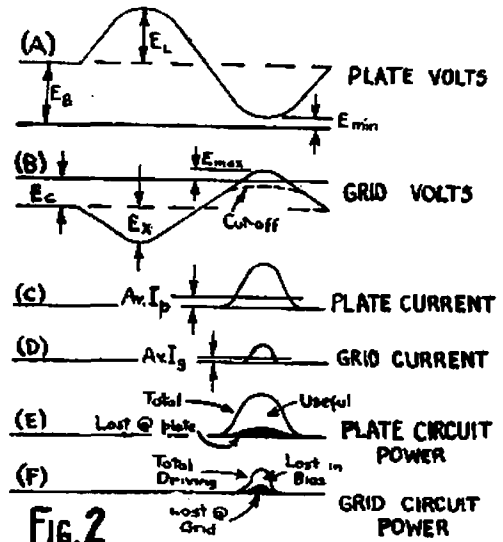
### (1) Unmodulated Amplifiers.

First let us consider the conditions necessary for efficient operation of an unmodulated amplifier operating class "C." Referring to Fig. 1 (neutralising arrangements being neglected)  $E_x$  is the peak value of the driving voltage,  $E_L$  is the peak R.F. voltage built up across the plate tank (to which the antenna load is coupled),  $E_B$  and  $E_C$  are plate and bias D.C. voltages. Fig. 2 represents the conditions of the various voltages and currents in the circuit of Fig. 1. The blocking condensers are large enough so that no appreciable R.F. voltage is built up across them.

It must be realised now that the voltage at the plate of the tube oscillates from the steady D.C. value of  $E_B$  up to nearly twice  $E_B$  and down to nearly zero. It must also be rea-

lised that the voltage  $E_L$  builds up as a sine wave not because it is an amplified version of the grid excitation, but because the tank circuit is highly oscillatory and the pulse of plate current once per cycle maintains it in a steadily oscillating condition. This, incidentally, is the reason why the antenna must not be coupled too tightly to the plate tank, since a very tightly coupled antenna renders the tank circuit no longer highly oscillatory, introducing spurious and harmonic frequencies.

Returning now to Fig. 2, we observe that when the grid approaches a positive value the plate voltage at that instant is very low (hardly greater than the value  $E_{min}$ ) consequently the cut-off value is only a few volts negative and plate current only flows as shown, when the grid voltage exceeds cut-off. Cut-off voltage is shown dotted and varies with the plate voltage. With normal adjustments the interval of plate cur-



**FIG. 2**

rent flow is for about one third of the cycle only, or about 120 degrees. Grid current will flow while the grid is positive and the power to supply this has to come from the exciter stage. The power output from the exciter is rectified by the grid and dissipated partly at the grid and partly in charging up the bias pack.

We come now to an important point, namely, that if  $E_{max}$  (the positive voltage on the grid) exceeds the plate voltage at that instant ( $E_{min}$ ), excessive grid current will flow unless prevented by a grid leak or a bias pack of poor regulation, which would automatically increase the bias  $E_c$  if this bad operating condition were reached. Anyway, to save burning up the grid we must have  $E_{min}$  fairly high (say 15 per cent. of  $E_B$ ) and limit the peak grid

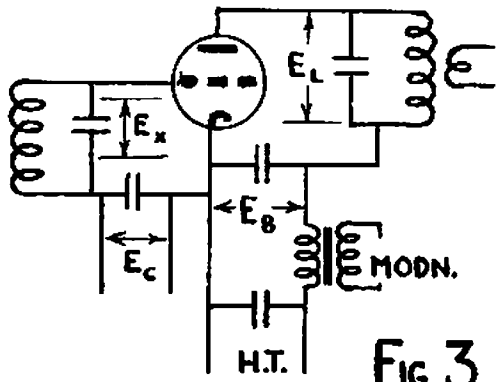
about 70 per cent. In this article only the tube efficiency will be considered.)

### (3) Poor Efficiency.

Poor efficiency will result if the grid is not driven sufficiently positive since then the pulses of plate current will be smaller and a smaller R.F. voltage  $E_L$  will be built up across the plate load. Thus the value of  $E_{min}$  will be higher and the tube efficiency lower. Poor efficiency will also result if the grid bias  $E_c$  is made too large for the available excitation  $E_x$ , thus not allowing the peak grid voltage ( $E_{max}$ ) to become sufficiently positive. In practice the regulation of the exciter stage helps here since it allows  $E_x$  the R.F. swing to increase if  $E_{max}$  (and hence  $I_G$  and the grid driving power) is too small.

### (4) Plate Modulation.

For successful plate modulation of a class "C" amplifier the conditions of operation have to be slightly modified. Referring to Figure 3, the effect of plate modulation is to vary  $E_B$  at an audio frequency rate. Notice that the plate blocking condenser must be small enough not to bypass the highest audio frequency, and that the final filter condenser of



**FIG. 3**

voltage to less than this figure. Typical figures would be:—

Plate volts . . . . .	$E_B$ 500 volts
Grid volts . . . . .	$E_C$ 200 volts
Peak RF across tank	$E_L$ 425 volts
Peak RF grid excitation . . . . .	$E_x$ 250 volts

whence  $E_{min}$  equals 75 volts;  $E_{max}$  equals 50 volts.

### (2) Good Efficiency.

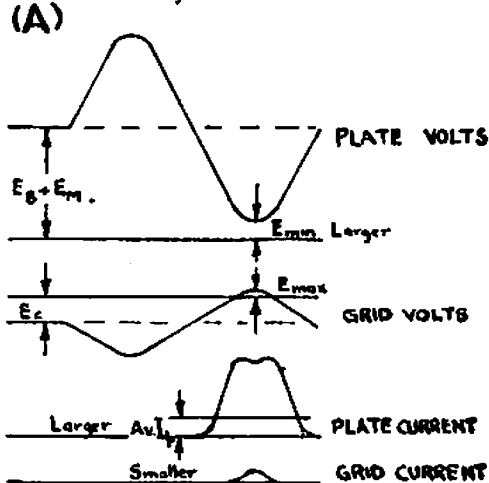
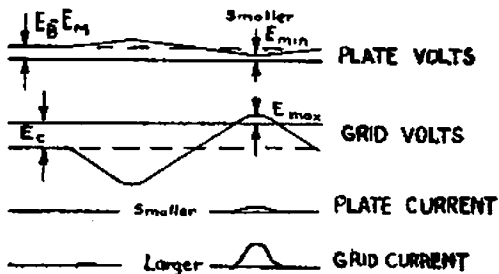
The average plate current  $I_B$  (shown on the DC plate milliammeter) will be very much lower (perhaps 20 per cent.) than the peak of plate current as the pulse of current lasts for such a short portion of the cycle. (Incidentally this is why the total emission capability of the filament has to be made so high by the manufacturers.)

Assuming that the current pulse lasts for 120 degrees we can assume (for simplicity) that the plate voltage is constant at the value  $E_{min}$  all the time the plate current is flowing. The power lost at the plate is then  $E_{min} \times I_B$  and since the input power is  $E_B \times I_B$ , tube efficiency equals  $E_B - E_{min} \times 100$  per cent. (approx.)

$E_B$

or about 85 per cent.

(Notice that a further 15 per cent. or so of the R.F. power is dissipated in the tank as coil and condenser losses, giving an overall efficiency of



**(B) FIG. 4**

the power supply must be large enough to act as a bypass for the lowest audio frequency.

Turning to Fig. 4 (a), we see the conditions during one cycle of R.F. when the modulation is at a negative peak. The effective EB is low and the available amplitude of oscillation EL across the plate tank is small. Further the value of Emin (the lowest voltage to which the plate swings) is smaller than for the unmodulated condition. This means that it is now very easy to over-excite the tube at this point in the modulation cycle. Furthermore, the bad effects of Emax (the largest

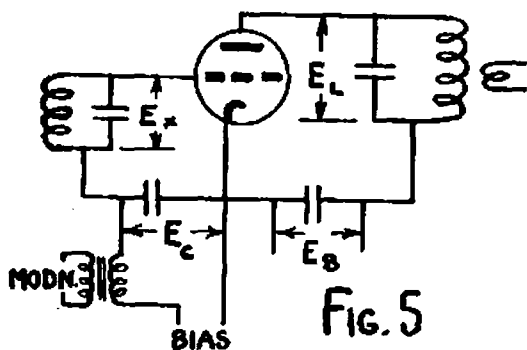


FIG. 5

positive grid voltage) exceeding Emin will show up, not merely as overheating of the grid and secondary emission from the plate (tending to give blue glow and liberate gas), but also as distortion, flattening the peaks of modulation.

All this means that the value of Emin must be higher during the unmodulated state than in a simple telegraphy transmitter. This may be achieved by decreasing both the excitation and the bias from the value used to obtain best efficiency under C.W. conditions. The plate current with the antenna disconnected should be higher for phone operation than for C.W. In the interest of good phone we must sacrifice a few per cent. of the efficiency obtainable in a C.W. final stage.

Referring to Figure 4 (b) we see the conditions existing over one cycle of R.F. at a positive peak of modulation. Here EB is nearly double its unmodulated value and EL is consequently much larger. Also Emin is higher than before. Consequently we can now stand a higher value of Emax at the grid and the exciter will deliver a slightly higher voltage than before. This good effect may be increased somewhat by getting some of our bias Ec from a small grid leak bypassed for R.F., but not for audio frequencies.

It is easy to see that the above mode of operation can be completely upset if there is any R.F. feedback from the plate circuit to the grid circuit or the exciter unit. Hence the need for very careful neutralisation of the modulated amplifier. Poor neutralisation can cause more trouble in the way of distortion and spurious radiations than any other single misadjustment.

### (5) Grid Modulation.

Modulation of a class "C" amplifier can be effected by injecting the audio voltage into the grid in series with the bias Ec as shown in Fig. 5. This is sometimes known as the van der Bijl circuit. The effect here is that Ec is varied at an audio frequency rate. The conditions at a negative peak of modulation are illustrated in Fig. 6 (a). The operation is essentially that of an under-

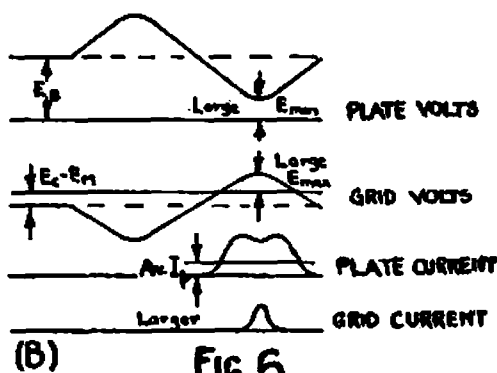
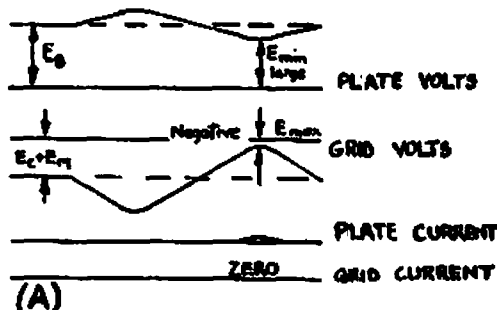


FIG. 6

excited class "C" amplifier with resultant low output and poor efficiency. Notice that E\_min is practically equal to EB so at this point of the audio cycle, the tube efficiency is very low indeed. The conditions at a positive peak of modulation are illustrated in Fig. 6 (b). Here plate current flows for the whole of the half cycle and operation is approximately class "B." It can be seen that in this case it is very easy indeed to over-excite the amplifier as Emax can easily rise to a quite high positive value. In order to avoid this it will be necessary to limit Emax to quite a low value in the unmodulated



condition. Hence the efficiency is going to be quite poor compared to a C.W. final stage. It is unlikely that the efficiency of a grid modulated amplifier (adjusted so that distortion is not too serious at high modulation depths) will be better than about 60 per cent. In addition the adjustments for linearity of modulation will be considerably harder to maintain. Notice that a considerable audio frequency component of plate current will exist, due to rectification. This component must be effectively bypassed through the final filter condenser and should not be allowed to build up a voltage across any resistance or inductance in the plate circuit before it gets back to the filter condenser.

## (6) Cathode Modulation.

Modulation may also be effected by injecting the audio into the cathode circuit, where it will vary both EB and EC at an audio frequency rate. This form of modulation possesses largely the characteristics of grid modulation, but has certain advantages over that method. The circuit and conditions of operation are shown in Figs. 7 and 8. One point to be watched is the possibility of the higher audio frequencies being cut off by the grid and plate blocking condensers. The conditions of operation may be followed by considering them as a modification of the conditions shown in Fig. 6 for grid modulation.

At the negative peak of modulation (Fig. 8a) the tube is operating as an under-excited class "C" amplifier with even worse efficiency than in Fig. 6a. Fortunately this does not matter very much since the input at

this instant is low. At the positive peak of modulation (Fig. 8b) the efficiency is better than in Fig. 6b since EB is smaller. The amplifier at this point is not quite class "B." This means that the overall efficiency of a cathode modulated amplifier would be slightly better than in the case of grid modulation, for the same allowable distortion. At a guess this figure might be 65 to 70 per cent.

In addition the audio component of the plate current due to rectification will build up a voltage across the impedance of the modulating source. If the impedance is purely resistive then the voltage built up will be degenerative and the effect will be similar to applying a certain amount of negative feedback, i.e., distortion should be reduced (the magnitude of this effect is doubtful without calculation..

If, however, the impedance of the modulating source is not purely resistive the feedback will be out of phase with the original voltage and distortion will be increased. At low frequencies this could be caused by insufficient inductance in the modulation transformer (poor bass response); at high frequencies by the shunting effect of self-capacity, aggravated by the grid and plate blocking condensers. The author would like to have these conclusions verified experimentally before being too sure of their importance or otherwise. The experience of VK3SG (April Amateur Radio) seems to confirm them, however.

## (7) Effective Power of Carrier.

At 100 per cent. modulation depth, one third of the total power is concentrated in the sidebands. In plate modulation this extra power is

# HAMS!!

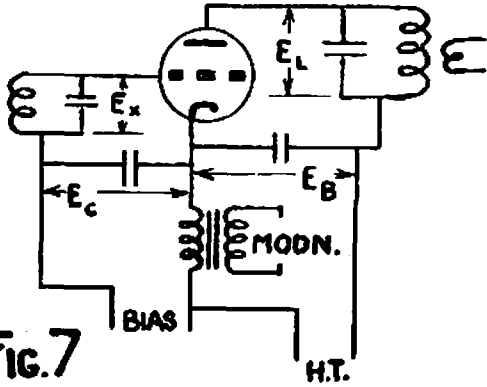
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supplied from the audio tubes. In grid and cathode modulation it is not. Hence we may tabulate as below for a final amplifier drawing 70.n.A.



at 500 volts, and operated under about the best conditions attainable for efficiency consistent with reasonable distortion.

**(8) Summary.**

In every way plate modulation is

(in VK3SG's transmitter 80v. grid leak bias against 50v. from the bias pack) probably helps to make adjustment less critical. His practical experience points to over-excitation as being the worst possible fault which can occur, and one which can be very easily encountered.

The correct excitation for CW operation under efficient conditions is definitely overexcitation for phone operation. Another tendency about which the author is suspicious is the use of power transformers for coupling modulation into the final amplifier. The audio characteristics of most power transformers must be just "lousy" (particularly at the higher frequencies).

In conclusion the author hopes that this article may be of assistance to those in their endeavour to get a decent phone on the air. In view of

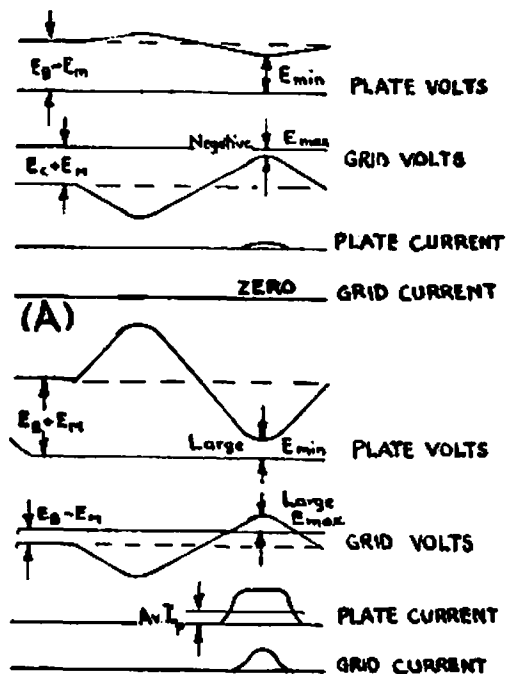
	CW	Plate Modn.	Grid Modn.	Cathode Modn.
Input from B Supply . . . . .	35	35	35	35 watts
Tube Efficiency . . . . .	90	80	60	70 %
Tank Efficiency . . . . .	85	85	85	85 %
Carrier Power (unmod.) . . . . .	26.7	23.8	17.7	20.8 watts
Carrier Power (100% mod.) . . . . .	—	23.8	11.8	15.2 watts
Total Power . . . . .	—	11.9	5.9	7.6 watts
Sideband Power . . . . .	—	35.7	17.7	22.8 watts
Reqd. from Modr. . . . .	—	11.9†	0†	2† losses
<b>POWER EFFECTIVENESS.</b>	—	100 %	49 %	64 %

The above figures speak for themselves.

superior to grid or cathode, except in the question of initial cost. If it is financially possible, it is desirable to install plate modulated phone. The trend of American usage is more and more towards plate modulation wholly and solely, together with some form of over-modulation indicator.

Where finance does not permit the use of plate modulation it is wise to pay a good deal of attention to design and operation if either grid, cathode or suppressor grid modulation is employed. Unfortunately, if finance is a major consideration the stations most likely to turn out poor phone (i.e., those not plate modulated) will not have much or any equipment for checking correct operation.

As regards the choice between cathode and grid modulation, cathode should win hands down, although it can suffer even more from maladjustment than can grid modulation. The use of more grid leak to some of the budding phone operators is a bias voltage than bias pack voltage



**FIG. 8**

the more serious attitude taken recently by the R.I.'s towards bad phone, it will be necessary for amateur phone to watch its step.

# For QSL Cards

see

# Back Cover

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## Contest Notes

---

(R. E. Jones, VK3RJ, Federal Contest Manager.)

### VK-ZL Contest Results

The contest manager, Mr. Ryan, has pointed out that the list of disqualified stations was omitted from last month's issue. At his request they are published below.

1938 VK-ZL DX Contest:—Senior disqualifications: VK2TF, VK5ML, VK7AB, VK2JX, VK3MK, VK2AFJ, VK3Q, VK3VQ, ZL1LC, ZL1LM, ZL2VM, ZL1GX. Junior disqualifications: VK2ADE, VK2HF, VK2DG, ZL1MR, ZL2QA.

### VK 160 MX CONTEST, 1939.

This contest inaugurated in 1938, met with such great success that it is proposed to hold a further contest in 1939. The contest will take place on Saturday, 2nd September, 1939, commencing at 1200 GMT and continuing until 2200 GMT. Rules are as follow:—

1. The contest is open to all licensed amateurs, but only members of the W.I.A. or N.Z.A.R.T. are eligible for awards.

2. The test is of a contact nature, and with each contact a six letter cypher must be exchanged before a point is scored.

3. The cypher to be exchanged will consist of six letters, the first three being chosen by the entrant to be used as his identifying letters throughout the contest and the remaining three are to be the first three letters of the last station contacted. The initial cypher will consist of three letters of the originating station, followed by AAA, for example, XYZAAA.

4. Stations with which an entrant can work are those beyond a radius of 200 miles, but within Australia, New Zealand and New Guinea.

5. Each station can be contacted once only during the contest.

6. Districts are as follow:—VK2, 3, 4, 5, 6, 7, 8, and 9, ZL1, 2, 3, 4.

7. All transmissions to be in accordance with the Radio Regulations.

8. Scoring.—One point will be scored for each 200 miles covered in the contact.

9. The total number of points so obtained will be multiplied by the number of districts worked.

10. All logs must reach the contest manager, W.I.A., Box 2611W, Melbourne, by 14th October, 1939. The logs must contain:—(a) Time; (b) call sign of station contacted; (c) cypher sent and received; (d) contact points claimed, number of districts worked and total score.

11. Certificates will be awarded to the leading station in each district, and a special certificate will be awarded to the outright winner.

---

### Federal and Victorian QSL Bureau

---

(R. E. Jones, VK3RJ, QSL Manager)

A list of cards on hand for VK3 stations will be published in these notes in the July issue.

W9VKF, L. Morrow, of Minneapolis, Minn., U.S.A., writing VK9RM, says, "This is the first time in my life I have ever heard a VK9 and it was my luck to have our QSO ruined by one of those doubly-damned electric razors. When the user stopped the contraption you had gone." The price of progress, especially to morning DX merchants.

Claimants for Century DX Club awards should carefully check their entries with the official list of countries as the entry is gone through with a fine tooth comb and doubtful countries unceremoniously rejected.

It is good policy to throw in an extra couple of countries for good measure, just in case.

The QRA of TF3F is required by this bureau, also any record of any-one receiving a QSL from J8CD.

Melbourne was honoured during late April by a visit from Arthur, VK4AW, and Bill, VK4RY.

During the absence of Buck, VK7JB, in Sydney, Joy, VK7YL, is conducting the VK7 QSL Bureau.

Another old timer to stage a comeback is Oscar Alder, VK4JB. Had a QSO recently with him, exactly ten years after our first contact. Oscar's original hand drawn QSL card is one of my prized possessions.

Two Czech hams, Arnost Ansherlik, OK1FZ, 26 years old, and OK2OR, Egon Hein, 24 years of age, are keenly desirous of migrating to Australia. Both are "harmless politically" and are advanced technicians. Arnost is an electrical engineer specialising in HF work and the construction of commercial broadcast transmitters, whilst Egon, besides being a third year medical student, is an expert in the manufacture and sale of liqueurs and spirituous

drinks. Both speak and write English well, besides having a good knowledge of the French Czech, German and Slovakian languages. Any-one who can help these chaps realise their ambition please communicate with this bureau.

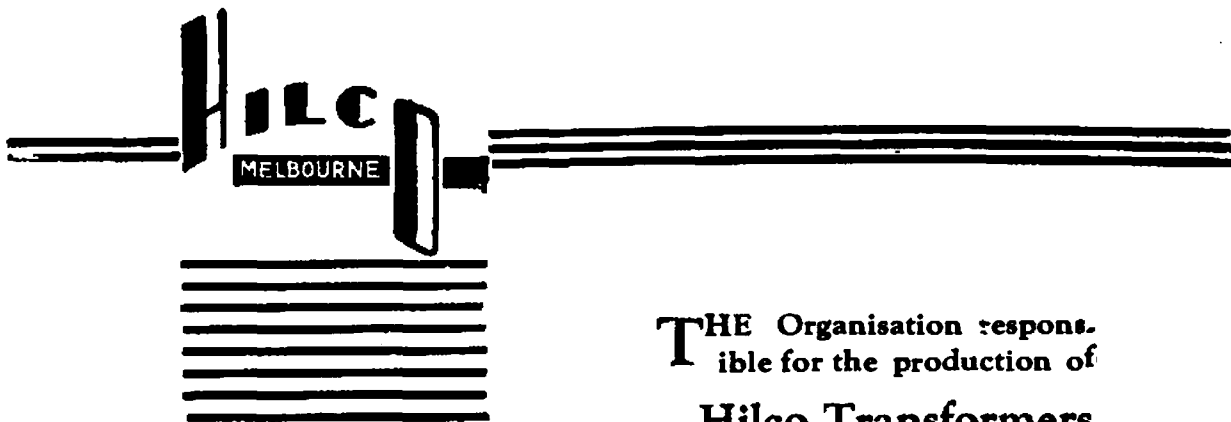
### Victorian Country Convention

The Eastern Zone Convention to be held on June 10-11 at Sale promises to be the best yet.

It will be the King's Birthday week-end, and should be a good opportunity for a good holiday.

Besides visiting 3TR and 3GI, there will be an opportunity to visit the Government oil bores, sugar beet factory and other places of interest.

An interesting agenda for discussion is also being arranged. Bring your YL or XYL and make a holiday trip to Sale for the Convention.



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## 56 MC in VK6

**SUCCESSFUL FIELD TEST.**  
(By VK6WZ.)

You couldn't call it a "field day" because it spread over more than forty-eight hours; you couldn't call it a contest because it was non-competitive; you couldn't call it a portable test because most of them took their a.c. powered crystal controlled gear along and set it up in the guests houses, private homes and so on. But—you're entitled to call it a success! And a triumph for united and unselfish co-operation.

For a long, long time the Dx record on 56 mc in VK6 stood at about 5 miles. That distance was set up shortly after the first five metre work began years ago. It was only recently that new blood plus old-timers plus crystal-control plus efficient receivers plus enthusiasm rocketed that record up to eighteen, nineteen, twenty and more miles. These increases in span took place during the April 2 field day. What was to be done? Leave it at that or work harder? They worked. 6LW filled his car with five metre gear and batteries and made mobile tests in the Darling Ranges with 6BB, 6BW, and 6SA. They felt confident that the newly established 20 miles or so record would be short-lived. And so the idea of the long week-end test was born.

### The "Field Test."

On Saturday, 29th April, cars and vans of all shapes and models made their way to selected spots around the metropolitan-suburban and near-country districts about Perth. 6BB and party went to Scarborough on the coast, north of Perth. 6BW made for Kalamunda where a commanding site had been chosen overlooking the coastal plain. 6GB set off in a car—originally planning stops along the road to Northam, but making last minute changes in plans. 6GM chose Safety Bay, another seaside resort, but this time south (considerably so) of Perth and 6LW erected a sta-

tion on the Toodyay road at Red Hill. The idea was to have all stations operating by 6 p.m. on the Saturday and keep going for forty-eight hours with relays of operators and each station taking a specified ten-minute listening period in each hour.

Between six and seven all stations got on the air and for a while spasmodic QSO-ing went on without adherence to the schedule but to allow a check to be made on gear and get it in working order. One of the first contacts was that between 6BB and 6ZX who had been working feverishly on gear to take part. He told 6BB that he was at home but hoped to go out the next day with r.c. super and stabilised transmitter. As Saturday night wore on stations settled down to regular calling and listening periods. Up to this time nothing had been heard of 6GM. Were they on? Nobody knew.

Meanwhile 6GB's party ("mobile" unit of the scheme) had decided against Northam and set up at Bindoon. Here calling and listening skeds were kept, but absolutely nothing was heard. During the early morning watches faint carriers with no discernible modulation were heard, but that was all. Next morning, one of the operators in the party (6FR) went in one of the cars to test, taking a transceiver and travelling about 12 miles. Results were poor. At 11 a.m. on Sunday the party decided to quit Bindoon and made for Bullsbrook, the location of the R.A.A.F. Pearce field. There from 3 p.m. onwards, QSO's began which were to play a big part in the success of the test.

### The First Night.

At the other stations the schedule was observed in various ways. 6BW with his 47 watts input to an 809 alternately played recordings, called

and listened all through the night with negative results. 6BB heard him and called several times, but was unrewarded. At 2 a.m. 6BB and 6WZ decided that little could be done by waiting up all night and so the station closed down. 6LW, a fixed station using more or less portable gear and depending upon portable power, had trouble with low battery voltage and the genemotor, but when possible calling and listening skeds were kept. A dipole and two  $\frac{1}{2}$  waves in phase made up the antenna gear, but the dipole gave the results.

Still no word from 6GM when Sunday dawned. As QSO's were made operators asked each other about the Safety Bay station. It hadn't been heard. Perhaps they'd had trouble and been unable to start.

Just as surmise was at its height 6GM himself and one of his operators (6MW) arrived on the scene at 6BB. They'd been on all night, except for a period when a transformer blew up, but had heard nothing. Thinking their sigs were being heard and answered and that perhaps their receiver was at fault the decision was made to visit 6BB and find out. They were told the story and departed, picking up some timber on the return journey, finally arriving back with the determination to raise the dipole a few feet, only to be told that in their absence the first contact had been made—6GM-6LW, a distance of about 38 miles and a new record.

### The Record.

With the 6GM antenna raised to about 35 feet, QSO's began in earnest and soon a new record, THE record, was set up when 6GM contacted 6GB. The two most isolated stations had worked! Distance, about fifty miles. Power, at 6GB 16 watts, at 6GM 15. Two new records in one week-end. When it was all over and the results known the unanimous opinion was that it was well worth while. Those who took part were:— At 6BB: 6BB, 6EI, 6KW, 6RU and 6WZ; at 6BW: 6BW, 6KS and friends; at 6GB: 6DF, 6FR, 6GA, 6GB, and 6MY; at 6GM: 6GM, 6IG, 6JG and 6MW; at 6LW: 6AF, 6LW and 6RB (6ZX operated alone for part of the week-end and home stations 6CP and 6SA were active part of the time).

At a special meeting of five-metre experimenters held shortly afterwards the decision was reached to make further efforts to extend DX on five. To this end a tentative scheme is in skeleton form for August when stations, instead of being formed roughly in a circle, will be set up (if possible, power supplies permitting) in a line 150 miles long.

If modern gear and enthusiastic co-operation can do anything, look out for more records! 56 mc is going places!

## Victorian Northern Zone Convention (By VK3MR.)

This zone held its second convention at Bendigo during the last week-end in April, the first being held at Ballarat last year. All voted it to be the biggest and brightest of country conventions, and was attended by some forty-three hams from all parts of the State as well as many visitors from the city, which included Mr. Gronow (3WG), our president, and who is also the Federal President. and other members from the Council.

Proceedings commenced at 6.30 p.m., Saturday, with an excellent dinner at the Family Hotel, after which we all adjourned to the commercial room, where the meeting was held. Mr. P. Dunne, representing Mr. Martin, from the Wireless Branch of the P.M.G.'s Department spoke at some length on the regulations in existence, and was able to clear up many points which were not fully understood. It was very gratifying to see that the department was in sympathy with us, and a friendly relationship existed.

Mr. Plowman, father of 3QC, gave a very interesting talk on Central Australia, and interwound the past and present methods of communications with his story, which dated back to 1912.. He was very proud to know that a ham, Mr. Alf Traeger VK5AX, was responsible for the introduction of the pedal stations in operation. 3WG, who is on the technical staff of the Inland Mission continued the story, which was of great interest.

(Continued on page 15.)

## 28 and 56 M.C. Notes

(A. Pritchard, VK3CP.)

We have had a month of interest this time and ten has kept us really busy. There is quite a lot of activity in the States VK2, 3 and 5. Monday, 8th May, gave us a thrill for short-skip work and Reg of 3XP deserves the credit for the evening. Around 7 p.m. 3XP heard many VK2's with exceptional strength on 20 mx, so on calling VK2ADT suggested trying 10 mx, with a fair contact on changing down. Before the evening was out, i.e., 11.30 p.m., 3XP had 3CP, 2ADT, 2UC, 2AIL, and 2ADU all in a six way round table contact and did we enjoy it! All signals were between r7-9 on peaks with patches of high speed-fading. This Lismore gang certainly make a good short-skip distance from VK3 (being 500 miles north of Sydney) and incidentally this should be an ideal distance for 5 meter dx work. We all remarked how important it was for more chaps to get on 10 during the evenings and keep a look out. Apart from the wonderful signal strength each end, it would relieve the hopeless mess on 20 meters. Also some of those signals signals that seem to be all 2nd harmonic which unfortunately for us land in the low freq. end of the band.

VK2ADT uses an 801 in the final with a vee beam having two full waves at 20 mx. 2UC also has an 801, 2AIL a doubler 809. 2ADU had the most outstanding signal here and was the same as a local. Frank has quite a nice line up, being a 6L6 co, 2-6L6 doublers, T20 final. The modulator has a GT3 xtal mike into a 6C6, 76, 42's PP into 809's Class B. The rx has 11 tubes plus a pre-selector also, not forgetting an Rmeter. The 20 mx antenna has two  $\frac{1}{2}$  waves in phase with two more as directors, which makes it hard to account for the remarkable sigs. as we are back on.

During the same evening PK1VM qso VK5IT was r7; VK5ZU was also heard, together with XZ2JB, the latter being r8 here. Low power will

do quite well and the following chaps are using between 12 and 20 watts for their portable rigs:— K6NEB is using a 6V6 co, T21 final, 12w, 6L6 mod. and a long wire antenna gives good sigs. W3ICR's portable in the car has 20w input and gave r7 sigs at midday here on Sunday, 20th May, his rig has 6J5G 10 mx xtal, 807 pa modulated by 6N7 connected in parallel and 6N7 running Class B, all powered from a Vib. supply and 6 volts. The antenna is a  $\frac{1}{2}$  wave rod on the back of the car; the rx has an 1851, 6J8G convertor in front of the car radio. K6RFU has 15 w from a 6F8 co, HY60pa, xtal switched to either 10 or 75 mx, the mod. 6F7, 6L6, 136ft. flat top antenna. W6DJZ also has a neat car outfit 6C5 40X (sure-fire circuit) 6L6 doub. 10 mx, 807 pa, 6N6G mod. A convertor having 6J8G and 6K7 is used ahead of the car set. W5FSU using a pair of 6L6's final and 210's class B, 35 watts input, had r8 sigs. at 8.30 a.m., Sunday, 30th April, from a 3 element close spaced beam.

3YP is in full swing again and the first six contacts were all over r9 on R meter readings from the States. VK3BQ and 3YP have been improving their receivers, with the addition of R meters in the 2nd det cathode circuit. Max has a 0-1 ma, R meter really giving results with a type 77, special anode bend rect. tube. The circuit constants are 100,000 ohms plate load and 10,000 ohms de-coupler; 100,000-50,000 ohms divided combination for the screen, 240 volts on the former, latter to earth; 15,000 ohms cathode bias res., giving a standing current of point 27 of a mill. By using this plate load, each 100th of a mill plate current rise on sigs, gives 1 volt across the grid. of the following audio valve, raising the needle to point 4 gives good speaker strength (13 volts being developed without account for losses), yet sigs from W6POZ and W6PMB put the needle hard over.



## DX Notes

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by VK3MR

It has been an ambition of mine to handle a rotating beam that I could squirt in any direction and melt the grid in the RF tube of the fortunate (?) ham who happens to tune to 14,300 kc. My hopes were realised early in May, when I spent holiday with 3BM—even to the RF tube! There I saw Vee Beams de luxe, Vee beams on all continents, the European one having 1 half waves per leg on 14 mc. Bruce has a rotating switch to select any ant. for his receiver, as well as the transmitter, and it is amazing to hear how the signals rise in strength as the correct aerial is used, and the unwanted signals disappear. It's great to have an aerial on which you can't hear North America and only Europeans and S. Americans can be heard and worked. I forgot to mention that the RF tube was in 3BM's receiver!

Conditions on 20 are not the best by any means, although a few good 'uns are to be worked. 7 mc shows signs of coming to life in the early morning for Europe, but the QRM there seems terrible, and reliable contacts are rare. VK2AHM is another ham who lives 100 miles from the nearest town, and can also improve the skyline with Vee beams. Jeff, with his 5 watts added another 5 countries to his list by working GW, CM, KB6, SP and UP5PZ. KD6QSX requires 5 cents for a QSL card! 2AHM knocks off 20 LU's in a quarter of an hour! I can offer a good suggestion to you city shaps who want to use a VEE beam—just shift your QRA—simple isn't it? VK3HG is still keeping his end up in this DX racket. Reports working TF3F, 14,400 kc., 4 p.m., making him 96 countries now. Neil considers CE and HC as "just contacts"—what a man! A new one popped up during the afternoon on 20 — TA1AA. Chirpy D.C. wandering around near the LF side of fone band—he worked 3BM. By the way, 3BM has a key in the shack after all!

Also his B.F.O. works, and very well, too! Those looking for Russian contacts can look for a solid T9 sigs. on about 14,400 kc. during the afternoons from 2 p.m.; that is, Russia in Europe, and coming the long way round. SP, OZ and G's are plentiful during any afternoon on 20 CN1AF is now EK1AF, which is the new prefix and is now recognised. 3MK. 2ALU is reported to have worked 750 Yanks in recent test, using a Vee of fencing wire as used by 2AHM.

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(Continued from page 13.)

Bruce Mann gave some very interesting dope on Vee Beams, which excited all DX men there. He gave some sound practical information, borne out in actual practice.

Mr. Trebilcock (3TL), the president during last year, retired, and Mr. E. Perkin was elected in his place, and Mr. Mann (BM) was elected secretary in place of 3HX. Both these retiring officers were thanked for their good work in the past.

Mr. Gronow spoke on Institute matters, and the meeting closed at midnight, although it is understood that 3 a.m. was the average retiring time! On Sunday visits were made to the local ham shacks, 3BO and 3CV B Class stations and the gold mines. Both the present and past presidents were invited to speak over the air from 3CV. This was readily accepted. It was late in the afternoon before the gang finally broke up to go home. The president of the zone wishes to thank all those who helped to make the convention such a wonderful success, and we are looking forward to yet another one next year.

## Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 15th of the month preceding publication.

### N.S.W. Division

#### GENERAL MEETING.

At the general meeting held on 20th April, the Senior Radio Inspector (W. T. S. Crawford, Esq.) presented the trophy which bears his name to the best amateur telegraphist in N.S.W. The winner of this year's contest was VK2ZK.

In making the presentation to Mr. Henry, Mr. Crawford referred to the high standard of operating of many of the entrants and made "honourable mention" of the two runners-up. At the same time Mr. Crawford stressed the importance of being a good telegraphist, and of the consequent extra enjoyment to be had from operating one's amateur station, because good telegraphy would lead to snappier and more frequent QSO's. Mr. Crawford went on to say that he often spent quite a lot of time listening in on short waves and enjoyed copying good Morse.

In his closing remarks Mr. Crawford spoke of the good feeling which exists between his department and the Institute. He also expressed the opinion that the Vigilance Committee was doing a good job, and helping to make the bands better for everyone.

The chairman, VK2HP, thanked Mr. Crawford for coming along to present the trophy to Mr. Henry. Mr. Peterson assured Mr. Crawford of always being very welcome at any of the meetings. A hearty vote of thanks was carried with acclamation. Mr. Henry now becomes the outright winner of the trophy, having won it this year for the second time in succession.

The trophies for the 1938 VK-ZL Contest were on view at the meeting. Complete results for that contest appeared in "Amateur Radio" for May. Mr. Crawford said that the

trophies reminded him of a N.R.A. prize meeting at Liverpool, and complimented the Institute on providing such a fine array of prizes.

Mr. J. B. Corbin presented the report of the delegate to the 1939 Convention held in Melbourne in April. The presentation of the report occupied the business for the rest of the evening. At the conclusion of the meeting Mr. Corbin, VK2YC, was elected Federal councillor for the ensuing year, 1939-40.

#### U.H.F. SECTION.

This section is being reorganised in view of the large amount of activity on this band these days.

Some body is necessary to co-ordinate the work of these experimenters. Meetings will be held on the first Thursday of each month at the Y.M.C.A. Buildings, Pitt street, at 8 p.m., and all interested are invited to attend. A recent fine performance on this band was that of 2VU at Singleton who logged 2LZ at Wentworth Falls, a distance of .00 miles.

2BN says he will be getting going again soon now that he has settled down to married life.

How's that car 2AHG? Why not sell it and try Ham radio again for a change?

2RA.—QRL with military and the flu last time I saw him. Saw his W.A.S. Certificate and went home with new ideas on how to get "WAS."

2VN worked FA3QV on 7 mc a few mornings ago at 0710 East.

2VA also finds 7 mc good in the early mornings.

2NO and 2MQ very keen about 5 metres. Big things will be done by these two men shortly.

2AIK gets out on 7 mc very well, in between typing with one finger and giving the kids "paddy whack." The school holidays are on now.

What a break for his pupils, and for Cec. too?

2TI and 2AFJ and a couple of others worked W6QQL Nevada, to help their W.A.S. Certificates materialise. 2TI 46 States now.

2KZ hopes to get on the air again soon, in between trips to the country. Why not put a portable in one of those railway trucks Arthur?

2EO.—Guess your in F.C.T. now Dave. How would you like to put that transmitter in the ham bands?

2HF is learning to fly, the idea being to save about four hours a day in travelling to work from Manly to Parramatta, and thus have a bit of time left for ham radio, so we understand, anyway.

"Thus news is made."

## COALFIELDS NOTES.

(VK2KZ.)

VK2YO.—Busy at present building the 2JU super, also 80 metre rig, using phone on 20 metres; also has designs on two half waves in phase, would like a call from anyone using 807 as buffer as 807 at YO is not so hot.

VK2XQ.—Now fairly active on 20 metres around 14370 kc, has a nice new rig with 801 in P.P., sure puts out a fine signal, also building an 80 metre job, as the boys here are going to get together this winter.

VK2XT.—Still inactive, due to not being able to find a suitable abode as yet, but threatens to build himself a shack and pay no rent.

VK2DG.—Using phone now on 20 metres, just received his DX Century Ciu Certificate, number 112, good going OM, doing a good deal service work, etc., using yet the good old zeppelin antenna.

VK2YL.—Has entirely rebuilt his rig and now looks swell and gets out nice too, heard regularly on midday schedules using phone on 20 metres; has four different types of antennas.

VK2PZ.—Also fairly active on 20 metres using phone. When are you going 10 metres Chris.

VK2MK.—A new amateur to this area who is operator on 2CK local commercial station; not active as 2YL has his rig.

VK2CX.—Very active on 20 metres, just left 40, and getting a fair deal of DX.

VK2ACG.—Also on 40 metres and a clobber of 2CX, doing plenty of

work on 7 mc, but also coming to 20 metres.

VK2KZ.—Regular attender on 14 mc, has designs on the 2JU modulator, also going to 80 metres for winter; several of this zone will be on 80 metres cw and phone, commencing the first Sunday night in June, from 8 to 10 p.m., and every Sunday night thereafter till winter ends, so anyone interested, please look for this zone.

The whole zone going to Newcastle on 21st May to visit the whole of Newcastle gang, and through the kindness of 2AES and 2BZ of Newcastle arrangements are finalised, and as a dozen hams going along with XYL and YL's included, we pray for a nice sunny day.

## ZONE 5 NOTES.

(VK2IG.)

Conditions here are very much the same as last month, contacts being easy on all bands but not so much real DX about, though we have landed an odd one or two which we will comment on in the DX section.

The hams in this zone are relaxing and having a well earned rest after having done nothing for the past few months, so that news of them is of a rather restricted nature.

VK2OJ is still sighing for a rotating beam, but he put up his 70 foot stick when there were no neighbours, now there are houses all around and he doesn't know how to get it down. (Tech. note—Release guy wires.)

VK2QD has finished something before the enthusiasm ran out. Has completed a nifty split stator condenser. He might someday even complete his xmitter at this rate. Congrats Hilton om., it's a nice job.

VK2AID doing nice work with grid mod. fone. Visited Albury recently and had a busy afternoon. Also had a demo how to work DX, hi! hi!

VK2AEO is on night shift and chases the DX at all hours, but N.S.G. The YF chases Pol and catches him O.K. though. Notwithstanding the rolling pin Pol manages plenty of DX at ordinary times.

VK2EU has his amplifier working FB, but appears to be waiting on the rx to fix its self. Wishes VK would come home so that he could borrow his rx.

## Amateur Radio

VK2AP has a listen at times, but can't find time to put up the rig yet, but hopes to be active again soon.

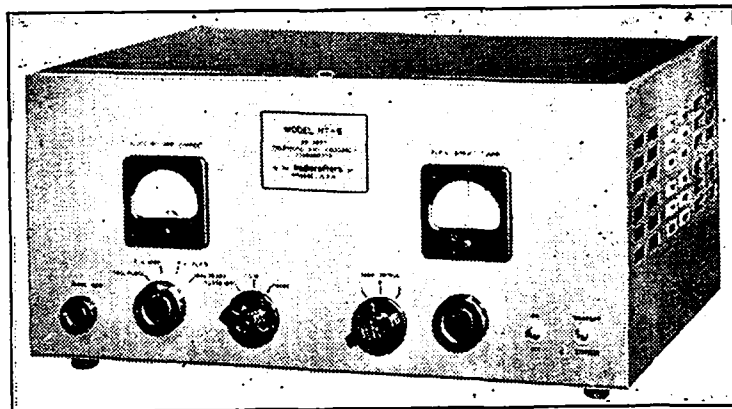
VK2IG working the W's with a beam over the South Pole or is it a beam! Anyhow it gets there when other VK's don't and gets tired when the VK qrm starts in W land so that suits us fine.

### BORDER DX NOTES. (VK2IG.)

QSO's at odd times seem to be the order of the day here still. Although it is becoming commonplace to work the U's at lunch time. We also worked W3FRY at around 1 p.m. at R6 both ends and he also remarked on the unusual time. It seems that W and Europe can be worked at any time of the day now but the field of the antenna has to be pointed in peculiar directions and not according to the book.

Pride of place goes to TF3F QSO's at about 4.30 p.m. on 14425. Among the U's are U2NE, 14405. U5YH in Crimea from 14410 to

14395. U3CU and U3CY on 14395. In South America we have PY2CD and PY1AH on 14345 with PY1AL around 14385. HC1HM on 14400. CP1XA on 14410. HI6Q, 14410. HJ5AR and VP6YV around the other end of the band on fone heard, but not worked. Others are CM2BZ on 14415 and CM6DV on 14420. XZ2AB on 14360. HR2ON, 14395. ZC6RL on 14360. IIR is also on 14400. CN8AY, 14400. VO3X, 14385. GACD T-nought around 14370. YV1AD on 14365. CT1IT, 14370. HB9L on 14365. All these are among the more common ones. VQ3TOM is on again as is MX3A. LU3HK on 14360. In the U.S.A. Island Groups are several stations who are not using the new prefixes. K6ILT and K6PMP appear to be on Guam. KC6BVL on Wake Is. is on 14365 and said he was having his first VK contact from there. Times of these are not given as they come in at all odd times, but if any one wants this information I will be glad to supply it.



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**THE SKYRIDER 5-10**, 8 tubes, built-in speaker, RK1851 stage of pre-selection, covers 27 MC to 68 MC in two bands.

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**SKYRIDER DIVERSITY**, 25 tubes, covers from 62 mc to 545 kc.

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## Victorian Division

### KEY SECTION NOTES.

After browsing through the efforts of other columnists, your correspondent feels himself at a distinct disadvantage in the compilation of this monthly screed. In the first place he is not in receipt of a fat weekly stipend, which in itself is a wonderful incentive (Ed. please note), and, secondly, he has not been in receipt of even one letter, abusive or otherwise, during the whole period of office. Compare this with the lot of the commercial scribe, who, when stuck for an idea has only to open up a few letters from the morning mail, and is sure to find something from "Fair Play," of Upper Oshkosh, with enough material to fill a couple of fair-sized log books, and to keep the wolf from the door for another week or two. The best that has happened to your correspondent is a secondhand report that some nitwit from the country had read these notes, and was of the opinion that your correspondent was a bull-dust artist of the first water. Now, I ask you, is that constructive?

The Convention held at Bendigo recently was a great success, and saw a big rally of country boys. Only a few of the city hams were able to get along, but the ones who did were rewarded by a very enjoyable week-end. Among the country boys present was XU, who also attended the Key Section Meeting on May 2nd, driving 75 miles for the purpose. Nice work! He is doing a little on 7, 14 and 28 mc., but is not particularly active at present. And, talking of bands, RJ wants to know why they stretch on Sundays. They may stretch a little, but your correspondent is of the opinion that they are not nearly as elastic as they used to be especially among the Europeans during a DASD Test.

UQ reports himself as "T5 and hums." Suggest that he gets in touch with W6MUM, from whom CZ received a very snappy card containing one only female, undraped, and obviously extolling the virtues of the product, the name of which coincides with his call.

Satisfied that he conforms to the definition, AH is building a Poor

Man's Rotary Beam. RX, having cornered the market in spotted bamboo, is also in the throes of erecting a non Aryan array. DP's super-gainer is still working, and bringing in a little DX on 14 mc., while QS, having built a similar receiver, is now looking for the gain. Often very elusive, that "gain" in super-gainers.

IW is threatening to hibernate for the winter, owing to the poor conditions on 14 mc., and RN, who finished his new rig on that band, has abandoned it in favour of 7 mc. EB has apparently given up motor boats for the present, and has rebuilt his rig, 6A6, 6L6, 809, and is now laying in wait for any unwary DX that may poke its head out of the jungle of QRM on 14 mc. JI is in the same box, and FR is rebuilding his receiver. SG is thinking of a new rig, but at the thinking stage only, while UM is still working on his new band switch exciter. ZH is not as active as formerly, reports having a new hobby, but whether beer or women, we know not. PJ is also inactive, but the cause this time is more definite—distant sounds of wedding bells. Which reminds your correspondent that he has just reached the third anniversary of his own nuptials. Feels more like thirty!

After a couple of years' absence, WB is on again with 30 watts on an 807 final on 14 mc. OU has spent some time on a 913 oscillograph, and operation of doubler and modulator stages is now as rigidly controlled as the importation of Asiatics into Australia. QW has at last cleared the bugs out of his super, and is now 7 mc. The fact of the bugs having taken residence in the BCL set instead is of little moment. SQ is looking for a good receiver to wipe out local QRM, and so joins the great majority, who, like the poor, are always with us. NI has gone to VK6, while ZU is fairly active on 14 mc phone. IK is rebuilding for rack panel operation, so has his hands full.

YK is again on 3.5 mc., using a half wave Zepp, and with 4 watts input receives consistent R8 reports from ZL. MR has left the big city for a few weeks' holiday with Bruce Mann, of Quambatook. Probably

will not be such a holiday for Bruce!

Your correspondent has to report his amplifier as still working well, and showing up the terrible quality of 99.9 per cent. of ham phone stations on 7 and 14 mcs. Supplies of brickbats are hopelessly inadequate to fill the demand that exists, to say nothing of the physical efforts which your correspondent would have to make in order to ensure them reaching their marks. The problem of dealing with the situation remains at present unsolved, but inasmuch as the pen is mightier than the brickbat, the great thought for the month is herewith presented:—How to win friends and influence people: Keep off phone on 14 and 7 mcs.

I thank you!

## U.H.F. SECTION NOTES.

(By 3JO.)

Section meets third Tuesday each month at the W.I.A. Rooms at 8 p.m.

A welcome visitor to Melbourne during the month was Gil Miles, 7KQ, who did so much about three years ago to put 56 mc on the map in VK3. A special meeting was hurriedly arranged for 8th May, and in spite of the short notice, was well attended and acclaimed a success by all.

Gil told us many things, of which the most outstanding are:—The lack of 56 mc activity in VK7, the blizzardly weather that has been with them on their various field days on Mt. Wellington, the improbability of consistent 56 mc DX due to its dependence upon refraction in the upper atmosphere, the impossibility of accurately forecasting just when and where these conditions will exist,

the necessity for continuous transmission and a chain of observing stations as a means of elucidating the mystery (?) of 56 mc, how the alteration of a few feet in the position of the antenna may have a large effect in bringing up the signal strengths, and how attention to detail in the construction of 56 mc gear is necessary for best results. Gil also expressed disgust at the continued use of super regen. receivers and praised the resistance coupled I.F. super het. These sentiments are well known to all who were on 56 mc about three years ago, but were new to the majority of those at the meeting.

It was determined as an outcome of this meeting to push ahead as soon as possible with the 3WI 56 mc transmitter and to keep in touch with Gil on 7 mc as much as possible. 3PS intimated that he would secure information on the "universe thermal activity" of the atmosphere in the vicinity of Melbourne and would make this known on 56 mc transmissions.

The statement by Gil that 56 mc working beyond the visual range would never be consistent owing to its being at the mercy of the elements, whose vagaries cannot at present be accurately foretold, may possibly dampen the ardour of some of the DX chasers. Let us here point out that chasing that elusive 56 mc DX is only one of the reasons for the continued requests for more widespread use of these frequencies. Amongst other reasons are the great amount of observation work still required to ascertain the extent to which atmospheric variations affect the various paths traversed by the

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signals, the development of the gear used to a higher degree of efficiency and the more extensive use of these frequencies for local contacts. In these days of crowded DX bands and restricted use of phone, this latter reason cannot be too highly stressed. For the ham who is weary of these restrictions and is fond of lengthy discussions on radio matters with his friend in the nearby suburb, this band offers a haven of refuge.

## WESTERN ZONE. (VK3HG.)

3SC.—Heard on 7 mc phone with nice signal. Glad to hear a station from Camperdown active.

3TW.—Fractured his last crystal and now experimenting with E.C.O., but with varying results.

3TN.—On 7 mc now and then.

3DD.—A regular on 14 mc phone, but heard lately on 7 mc with terrific signal.

3BU.—Schedules 3WT daily on 7 mc and very active on 56 mc.

3VN.—Co-operating with the above stations on 56 mc.

3BW.—Another who is active on 56 mc.

3II.—Turned up on 3.5 mc and expects to have the AC on soon with a 6,000 volt transformer right in the back yard.

3SZ.—Installed a dynamic mike, but having trouble with RF feedback.

3OW.—Active occasionally on 14 mc phone. Has new receiver perking. More interested in obtaining flying licence at present.

3HG.—Blew tubes in receiver. Has 116 foot stick on order and hopes to get it a vertical position soon with three V beams strung therefrom.

## NORTHERN ZONE NOTES. (By 3BM.)

At the very successful Northern Zone Convention, reported in another column, Mr. R. Trebilcock (VK3TL) retired from the office of president, and Mr. E. Perkin (VK3EP) was elected. The correspondent, Mr. T. Hogan (VK3HX) retired, and B. Mann (VK3BM) now takes up the pen.

3OR.—With genemotor repaired and a E408N replacing the ancient 10, Murray's 80 and 40 phone and CW are back to their former excellent condition.

3TL.—Resigned Zone presidency after a very successful year's work, but Treb remains as key station on Sunday a.m. hook-ups.

3EC.—Has the 20 mx rig going O.K. and is working DX phone.

3ZK.—Jim has been rebuilding the rig throughout. Quality never varies.

3HX.—Tom is very busy. Floods almost invaded his shack.

3TT.—Bill is heard on 80 mx phone at excellent strength and quality on only 1½ watts!

3QZ.—Graham Colley in an enthusiastic newcomer in Quambatook, using 6L6G, 807 combination with 230 D.C. on plates. By the way, Graham is the power station engineer, and has erected a pair of beautiful 76 feet sticks.

3EP.—Congrats. on Northern Zone presidency. Ted has changed his QRA in Bendigo, but has not re-erected his sticks yet. His good work was partly responsible for the success of our convention.

3WN.—Jack is very busy, but is occasionally in the Sunday hook-ups.

3NN.—Congrats. on the birth of a son and heir, Herb. That new vibrator power supply is working O.K.

3QC.—Bruce assisted greatly towards the convention's success.

3IV.—Has left Birchip and is now Stawell's only ham.

3CH.—Alf is threatening to rebuild and stage a comeback, but at present the 2nd op., Clyde, is doing most of operating there.

3BG.—Roth is complaining about the poor condx on 20 mx.

3CD.—Was at the convention, but never heard on the air.

3IH.—Fenton is in the city now.

3JG.—Johnny works DX on a large European V beam when he feels the urge.

3DU.—Doug has a portable rig which puts out a fair sig. on 80 and 40 from Clydesdale.

3EF.—Working 40 and 20 DX on the key! But Bert is seldom missing on 40 mx phone.

3CE.—Roy has some new batteries, and is on the job again. Is revamping the RX, and contemplating V beams. Is awaiting the advent of A.C. to Belliwillock..

3LL.—Ken is busy at the University.

3VP.—Chas. has a beautiful rig remotely controlled from the lounge fireside.

3BM.—Has 3MR with him at present. "Snow" was surprised to find both a key and a BFO!

### EASTERN ZONE NOTES.

The Eastern Zone Convention will be definitely held at Sale on June 10th and 11th. A most interesting programme has been arranged, and a cordial invitation is extended to all, and quite a number of members from other zones have signified their intention to be present. Places of interest will be visited on the Sunday, including stations 3TR and 3GI. As the date fixed is the King's Birthday week-end, it should offer the advantage of a long week-end holiday for those who care to stay, as there is plenty of places to interest in the district. Those intending to make the trip are asked to notify VK3XH of their intention immediately so that arrangements for accommodation can be made.

Now for some of the members' doings:—

3DI.—Jim QRL with service work and YL.

3EA.—Where are you, Evan?  
3GO.—Reported to be making a come-back.

3LY.—Ron has gone and got married. Might have more time for radio now!

3NO.—George still QRL at 3TR.  
3SS.—Keith on 80 occasionally. Quality not too good, O.M.

3VG.—Howard has at last got going on 80 mx, fb, O.M.

3XH.—Stan on occasionally. Just shifted QRA.

3QB.—Jack still working on 40 mx. When are you coming on fone, O.M?

3DG.—Dick back on 80 mx after working on 20 mx for months.

3XZ-3HZ.—Where have you two B.C. engineers got to?

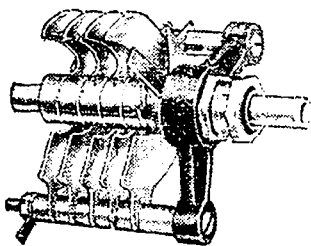
3PR.—Trying out Cathode bias modulation.

## Queensland Division

(By 4ZU.)

4FL.—Off the air for a few weeks, rumoured rebuilding using 6P6, 807, 809.

## EDDYSTONE RECEIVER COMPONENTS

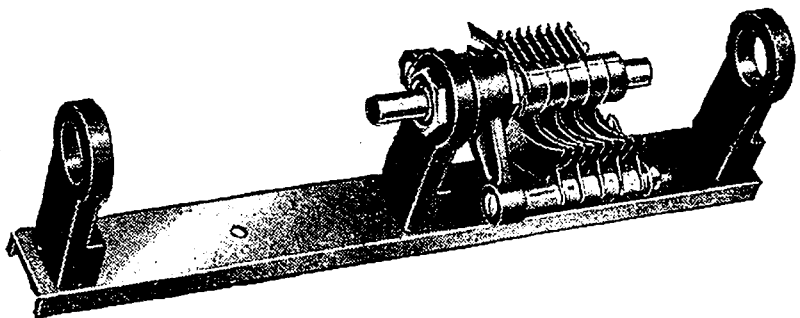


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4DK of Winton in QSO with 4FJ says its very cold out there but condx good.

4WB staged a comeback with 6V6, 6P6, 45, and is using good old series modulation. Ask 4FJ.

4EL mopping up Europeans on series modulated phone, input 15 watts. Eric has 112 countries now. Nice work om.

4JJ.—Jim very inactive of late, reckons he is going to give the rig to the baby to play with.

VK4HP just built a super and got pair of 6V6G's in final working to satisfaction.

VK4OJ.—Very active on 40 mx and is contemplating a super prior to going down to 20.

4FJ expecting super from overseas. Needs it badly owing to local qrm.

4GS.—Knocking off sundry W's on 14 mc phone.

4LK of Cloncurry down on visit to VIB with YF. Kept skeds with Brother Roy 4DK from 4EN.

4WJ staged a comeback. Just some more qrm for 4ZU.

4PX spends spare time chewing rag with 4GC—or is it 4GC?

4HU.—George's QTH is now miles. Hope to hear you on the air soon om.

4XR.—Waiting on junk from the south to get 50 watts going. Ask him who Dot is.

4XO.—QRL, but spends spare time riding 4XR's motor bike around.

4KK.—Keith of Milmerran was up in Bundaberg recently and was entertained by 4XO and 4XR.

2AGN has shifted QTH from Murwillumbah to Bundaberg, but does not seem in a hurry to get on. What's wrong om?

4JF, EL, FJ, ZU and UU all installing key click filters. What's come over the boys?

4AP heard testing on 14 mc fone.

4ZU trying out merits of vertical antennas.

4WT.—Bill seems to be extinct lately. We would like to see your cheery face up at the W.I.A. general meetings om. Wot sa?

## South Australian Division

(By 5PN.)

The chief event of recent weeks was the emergency organisation try-out on 7th May. The emergency men were called on 80 mx at 1.15 p.m. and were assigned various locations by the control officer, VK5JT. They were to proceed to those locations as quickly as possible and get on the air. They did so in remarkably good time and although the try-out was not 100 per cent. perfect it was entirely successful in that it showed up the little weaknesses in organisation and indicated the lines to follow in order to arrive at the goal towards which the emergency section has set its face, i.e., prompt and efficient establishment of an emergency communication network in any part of the State.

Those who took part in the try-out included VK5LC at Gladstone, 5KJ at Yudnapinna, 5JT at Burnside, 5FM at Mt. Lofty summit, 5LX aboard M.Y. "Pioneer" at Outer Harbour, 5DW assisted by 5RW, 5XA and Cec. Bareby at Blackwood, 5LD assisted by 5RK at Lobethal, 5RI operated by Dick Batye and Jack Scriven at Smithfield, 5KL assisted by 5BC and 5GB at Northfield, 5BF assisted by 5BG at Monarto South, and 5RN at Mt. Lofty.

### GREY ZONE.

(By 5LC.)

Paid a visit to 5RJ and 5HR and had a great time. Darce has a fine rig and now has a key in after about ten years of phone, hi! Bill has a very neat station, although the after effects of the fire can be seen.

5KJ still on but plant batteries went flat and had to come on with 2 watts on 80 mx with the QRR test Sunday p.m.

5GU.—Met Bob at Kadina and he is making a very fine job of his new rig.

5LC.—Was on 80 mx during QRR test on Sunday and worked 5JT, 5KJ, 5BF and 5RN, but at 1 p.m. it was like listening on the 5 mx band hi! heard 5LX.

Two country members in the city at time of writing are 5RE and Ron Green, both from Renmark. Hobby has gone all hot on home recording, so if you hear yourself on the air

at Renmark some day whilst you are snug at home don't be fooled into believing that it is a proof of reflection of radio waves from the utmost limits of space—about ten light years distance away—it is only the Old Man of the Murray up to his tricks.

## Western Australian Division (By VK6WZ.)

Division meets at 8 p.m. on second Tuesday in the month at Headquarters, corner Hay and Milligan streets, Perth.

Principal item of interest this month is the five metre field test run off during the long week-end (29th April-1st May inclusive) when a new distance record was created for the band. Further details elsewhere.

At the May meeting a good deal of business was transacted and the meeting was a long one. Discussion was long and varied and covered such subjects as the possibility of opening a "fighting fund" (see 5FM's letter to "QST"), five metre work, the extension of the Division's library, the inauguration of a campaign to liven up Institute activity and strengthen membership and last, but by no means least heated, a discussion on "A.R." It seems that old misunderstandings are still allowed to influence the actions and opinions of some of our members and that all appeals to support the Institute's organ and give it a chance to flourish as it deserves fall on hostile ears. 6WZ pointed out that it should be to the shame of V6 members that while the circulation in this part of the Commonwealth is very low, one Perth radio firm can at least support the mag. to the extent of advertising in it.

Still further discussion raged around the point of increasing the annual sub. from 10/6 to £1/1/- for full members to bring the Division into line with others and to relieve a rather strained financial position. It would appear that it's a case of "pay a guinea or move to cheaper premises." Notice of motion given by 6CC on this point for the annual general meeting for June and a suggestion received from 6YB (but recently returned from the East) that if that increase be made, "A.R." be included. Hope dawns! But me-

thinks June will see a stormy meeting.

Undamped waves:—

Feverish activity on part of all VK6's capable of making any sort of noise at all on 7 mc. Reason? That 809 donated by 6BB for the 14th.

6JC attended the May meeting which fell within school holidays. Just before leaving Chas. crik had some trouble with rig and had to miss all skeds; hopes be back on return.

6KS debating relative merits of banking and talkie projection as life pursuit. (Say, who wants to take home bits of film, anyway?)

6CX deputised for 6MW at May meeting and assured all questioners that he'd be on for the 14th.

6AF rebuilding.

6ZX determined to have more of this thing called five metres.

6FL finds life compounded of service work, flu, cricket, tennis and ham radio. Thinking of putting converter ahead of his super and listening on five.

6BB preparing (in conjunction with 6WZ) thesis on behaviour of cats mc. radiations! Black ones, especially.

6YL heard on 7 mc now and then. Rumours of a modulator being built.

## Tasmanian Division

(By 7YL.)

As the hon. secretary was in Melbourne attending the Convention, the meeting which was to have taken place during his absence was postponed until his return a week later. The results of the Convention were then made known and presented in a clear concise manner by Mr. Moorehouse.

The annual meeting and dinner are drawing near. At present it has not been decided where it is to be held. It is hoped that not just a few hams of both North and South will come, but amateurs and enthusiasts from every part of the Island. We know in some cases it is most difficult to obtain means of transport, and that often the bank roll (or should I say lack of bank roll?) hinders our progress, but as the annual dinner and meeting occurs only once a year, perhaps a little extra effort will do the trick, for, after all, who can keep a good ham down?

There is a huge stack of Qsl cards at the Qsl Bureau for non-members. Some are from quite f.b. dx stations. Unfortunately the stack is growing, so that it will soon be necessary to either extend the premises of the Qsl Bureau or to add the rubbish cart's load. Owing to financial reasons, the latter course will have to be adopted. After all, hams who are not member of the Institute have only to send along their addresses and a stamp to obtain the cards. This surely is not a very difficult task. Would anyone knowing the present address of Roy Jonasson, ex-7NG, please let the Qsl Manager have it, as his forwarding address has been mislaid, and there are about fifty cards here for him.

Condx. in Hobart are very patchy on 40 mx, but are definitely improving on 20 mx. The cw dx lately has been quite respectable, OA's, CE's and CX's coming through at R5.

VK2ADI, who is among the officers journeying to England to bring back the new Australian cruiser, "Perth," was in Hobart for a day or so this month. He visited one or two hams, but had very little time unfortunately. Will be returning via America, and intends to visit as many W's as possible.

## "Doings."

7CM.—Chases dx at early hours of the morning. Total of countries worked is now well past the fifty mark.

7AL.—Tom has evidently been making a noise in W, judging by the inward Qsl's. Spent a few days in Camp lately, we believe.

7CT.—Is very qrl again. Better not skip parades now you are a military man, Terry.

7JB.—Hopes to be transferred to VIH soon. Having been unavoidably inactive for 5 months, thinks he has probably forgotten how his rig works. I know an excellent instructor, Buck, hi!

7YL.—Has added an rf stage to receiver, which brings almost inaudible signals up to the R7 mark.

## NORTHERN ZONE.

(By VK7LZ.)

This Zone hopes to have an exhibit in the Electrical and Radio Exhibition to be held in the Albert Hall, Launceston, and which will be in

full swing by the time these notes are published.

The Department has been approached, and we have every hope of having a transmitter on the air from the Exhibition to give the general public an idea of our activities.

If everything is realised to our satisfaction, we will give full details of the exhibit in next month's notes.

As this month is the last in our financial year, our secretary has asked me to remind our readers not to forget their outstanding accounts, and to remember that they will be bigger still next month if not attended to in the meantime.

I am quite satisfied now that wonders will never cease—I can at last give you some of the doings of our members of the Nor-West Coast per favour of VK7RY. Keep up the good work, Ted!

VK7RY.—Off the air at present owing to the fact that he is at present stationed at Devonport.

VK7XR.—Now on 20 metres and working plenty of Yanks and a bit of good DX. Getting your outgoing cards O.K., Johnny.

VK7CK.—Am led to believe the long delayed power has arrived, Poley. A bit of rebuilding, what?

VK7KR.—Rebuilt his transmitter with great success on all bands.

VK7AB.—Working Yanks on 10 metre phone in fine style.

VK7RK.—Rebuilding his receiver and now going in for a super.

VK7CJ.—Busy swotting for an exam, and building big key-lick filters.

VK7CL.—On holidays at present, and on the air once again.

VK7GJ.—Getting ready for phone operation now his probationary period is over.

VK7LG.—Rebuilding transmitter on commercial lines.

VK7DS.—Having trouble getting his transmitter to perk on 20.

VK7LZ and VK7XL.—Not been heard on the air yet to my knowledge.

VK7HY.—Talking motor boats.

The next meeting of the zone will be held at the Launceston Y.M.C.A. on the 29th June.

## New Guinea Division

(By 9VG.)

Condx this last month have been patchy, with only W's and one or two Sth. Americans putting in any signals at all. Due to a hefty pwr leak your humble was off the air for about ten days, but did not miss much by all accounts. The VK's cannot be wrkd from hr now with any consistency, and even when we do get hooked up the reports are not very good. 9WL had a sked with a VK7 and to his surprise it came off. Talking of VK7, reminds me that I once wrkd one and the only one in two years on the air hr and the qsl is still coming! I hate to bring up the old topic again, but 9RM was up to see me to-day es he tells me in the last two months he has sent down to VK over 80 crds es so far has only received three in return. He is flat out to make a nice showing of crds on the wall of the shack. His own card took many hrs of patient work to make up, and a very expensive one at that, so what about it, chaps. At least try and keep your promise to qsl.

Now for some of the doings of the VK9 qrm gang.

9XX.—On the air again at last, and vy fb too Basil oc. Hrd frm one of the local SWL chaps you were on, Basil. Could not believe it till I hrd the stir among the W's to-night. Fb. oc and vy psed to hr you are ok again now, and all good dx be yours. Looking forward to hearing you on 40 om as we need a station over your way on 40 badly. Ur letter arrived ok, tnx a lot. New antennas seem to be the main these, with the "Poor Man's Rotary" a hot favorite.

9DK.—Ernie tells me the way dx is now it is hardly worth while going on. In a recent 7 mc qso Ernie told me he could not get above 23 countries. Well, when you think that this was all done with 6 volt batteries and genemotors I reckon it a vy creditable effort. Every other W I wrk now passes on his 73 to 9DK.

9WL.—Still having trouble with convertor now and again but still keeps on the air. Laurie missed a nice bit of dx when CO7 called him when he had gone off the air. Never mind oc he will come again sometime. Laurie had a bit of bad luck

a few days ago in charging one of his power producers backwards for ten hrs, but now has a larger one in place of it, so why worry?

9BW.—Bill is either rebuilding or deciding to put up an antenna or go South. He now has 50 countries all but one, and some vy fb ones at that, but the way the other lads up hr are talking of beam ants, etc., it won't be long before someone takes the lead.

9GW.—Last month we rushed in to print with news of the fine new shack, but as far as is known the rig is still unpacked. I guess I'll have to drop you a line oc es see what is doing.

9MC.—Last hrd of Bill he was shifting and had found a good posy with some nice handy t rees and hopes to do well there. Not only with dx though and we all wish you luck! oc.

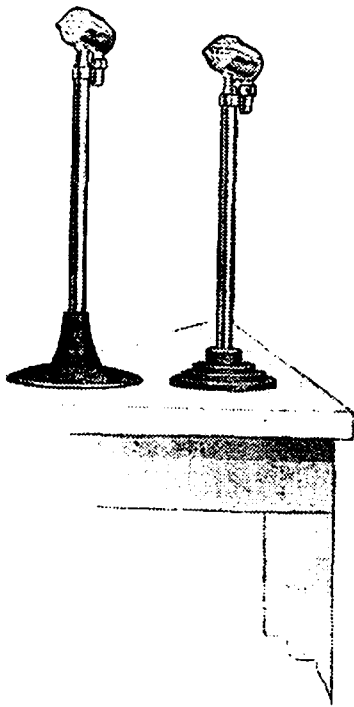
9RC.—Pops up on 40 for a rag-chew now and then. Also reports wrking K6 on 40 metre cw which same is fb. Let's hope it keeps up, Ron, and more pwr to your batteries.

9RM.—It took quite a while to get Peter off the qsl argument, but on a promise to give it mention in the notes this time we got down to dx at last. It seems that he is out to low the record for the most W's wrkd in a month, as he is going strong at about fifteen a night, getting in a few VE and K6 chaps for a chance. Rose at 6 a.m. one morning and pulled in ON4AU and next night an SM7 fell into the clutches.

9NB.—Starting from the ground up, as he is building his ant tower first, and it is going to be a three section rotary with steering wheels points of the compass n' all. Also decided (or rather went haywire) and sent for an RME70 all in a few minutes. More later about this as construction progresses.

9HB.—Apart from sending for a Howard rx, Harley has not made a decision as to the rig he is going to cuase all the dx chaps to sit up and take notice, so we will have to try again next month.

9DM.—Nearly forgot you, Dudley, this time, but what is doing down your way? The last time hrd you were on 40, but had gone before I got to you.



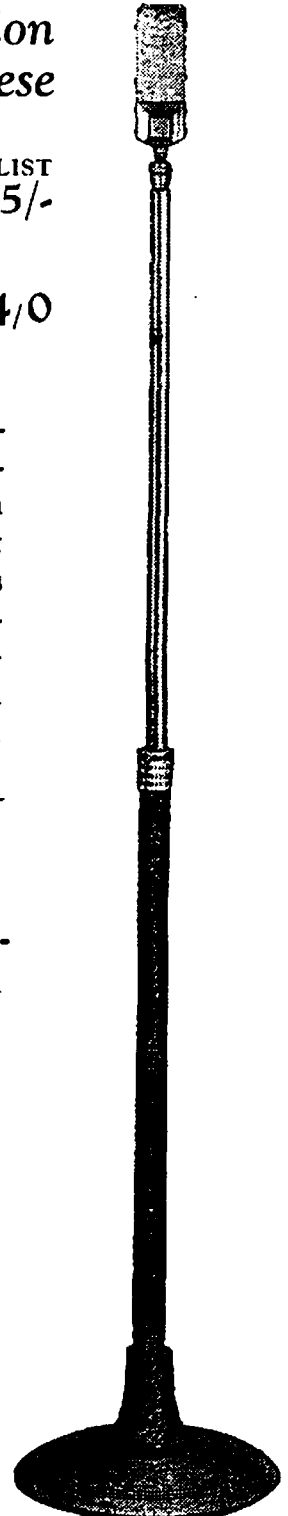
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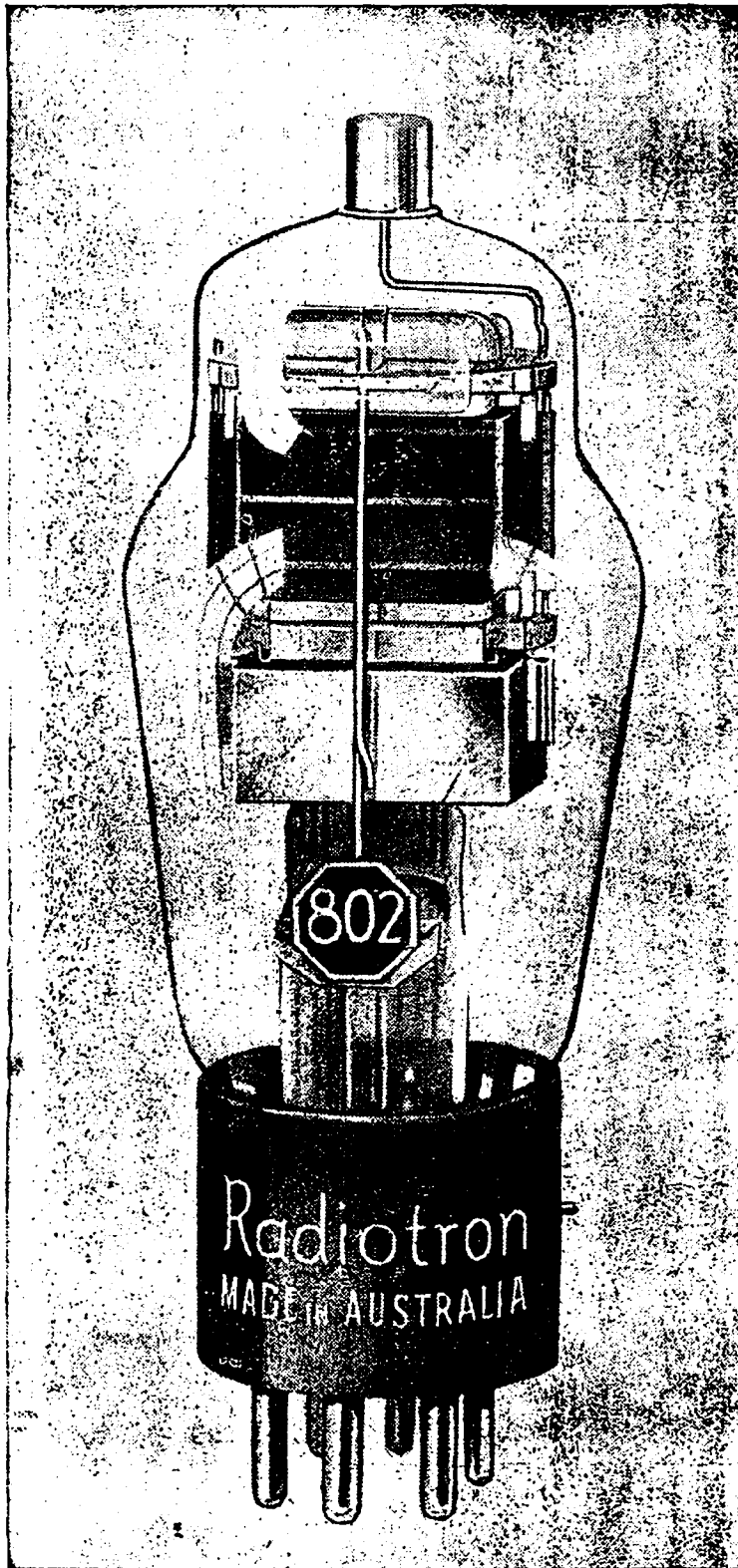


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Vol. 7 No. 7

1st JULY. 1939.

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Technical Editor—R. H. CUNNINGHAM (VK8ML); Notes—C. SERLE (VK8RX);  
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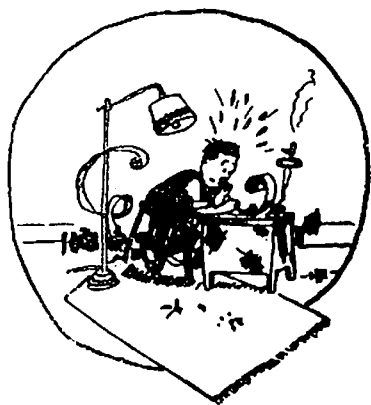
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## EDITORIAL

The Australian amateur experimenter has a great deal to be thankful for to those officers of the Postmaster-General's Department who are responsible for the interpretation and administration of the Wireless Telegraphy Regulations. The Wireless Institute of Australia can truthfully say that we as a body have received from the Chief Inspector, Mr. J. Malone, and his associates every encouragement and consideration in matters relating to amateur radio in Australia. Every experimental licensee, whether a member of the W.I.A. or not will be pleased to hear that Mr. J. Malone, has accepted a transfer to the Queensland Postal Services where he will occupy the position of Deputy Director of Posts and Telegraphs. An advancement of this type generally means a considerable increase in responsibility and we do not hesitate to say that the State of Queensland could not have selected a better administrator anywhere.

Mr. Malone has served with the Postal Department for approximately forty years and has been for nineteen years in charge of the Wireless Branch. During this time the branch has developed under his guidance until its activities which in that time have multiplied a hundredfold has developed on very sound lines, due to his organising ability. It would only be truthful to say that our pleasure at his advancement is tinged with regret at the loss in an administrative capacity to the amateur fraternity of a very real friend.

Many and varied stories might be told of the clemency extended to amateur experimenters by Mr. Malone and we sincerely hope that his successor will continue on similar lines in the future.

We wish him every success in his new sphere of activities and take pleasure in thanking him publicly extended on countless occasions.

—The Editorial Committee.

## Adding an "R" Meter to a Super

(By VK3WU)

A generally admired feature of some of the modern communication receivers is the "R" meter. Many Amateurs think highly of this attachment little realizing that an ordinary milliammeter can, in almost every case, be connected into almost any super het providing that the receiver includes an A.V.C. system. Whether it is known as a "Signal Strength Meter," "Tuning Meter" or an "R Meter," such a device is an extremely useful one to have, not only to hams, but to S.W.L.'s and DXers.

As an "R" Meter it permits giving "R" reports on received stations on a much more definite basis than in the case where such reports are dependent on the receiver alone—a fact well enough recognised to render further comment unnecessary. Some of the other advantages which are less widely recognised are perhaps even more important.

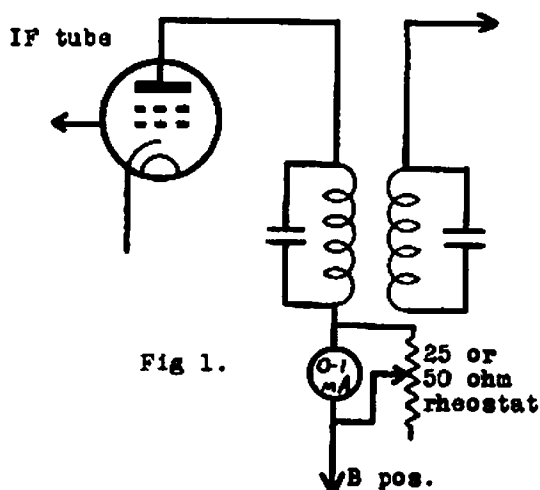
It likewise constitutes a check on the proper operation of a receiver.

The meter may be connected in one or more of the IF stages which are controlled by the A.V.C. system. The simplest is to connect it in only one IF stage and a meter with a range of 0.1 Ma. is employed with a shunt rheostat directly across the meter as shown in Diagram 1. The meter used need not have such a low range, but in any event the range should be less than the current of the tube circuit in which it is connected.

The rheostat has the effect of reducing the meter sensitivity and is adjusted until the meter shows full scale of deflection with no signal tuned in. It is desirable that the whole scale of the meter be used because the signals readings will be larger than would be the case if only part scale deflection was obtained with no signal tuned in.

Figure 1 shows also method of connecting the meter and its shunt in the plate supply lead of 1 or more IF stages. It is also possible

to connect such a meter in the cathode circuit instead of the plate circuit, but this has the disadvantage that both screen and plate current will flow through the meter. On the other hand it has the advantage that one side of the meter will be at ground potential. Which of these two methods of connection to use can be determined by individual instance by experiment.



A meter with a scale marked off in 50 divisions and equipped with a knife edged pointer is an excellent one for the job as extremely accurate readings can be obtained.

The value of the shunt rheostat depends upon the sensitivity of the meter used and also on the internal resistance, and a 25 or 50 ohm rheostat will be found satisfactory in most cases.

In addition to giving "R" reports, there are other ways in which the "R" meter serves to make better reports possible. For instance, it gives a definite check on the modulation of received signals. If a signal is modulated 100 per cent. or less, there will be no fluctuation of the needle after the signal is tuned in, whereas modulation over 100 per cent. will result in "wobulation" of the meter. The meter will show the carrier level of any signals and will

rise and fall as the signal fades in and out, but will not be affected by modulation unless over-modulation is taking place. The only exception is when the meter is incorporated in a receiver which, due to overloading or poor design, detector action takes place in the amplifier stages.

The "R" meter is a perfect indicator when making adjustments to the receiver or aligning the RF or IF stages. In effect, it indicates the level of the signal at the input to the second detector and, therefore, will show immediately any change which results in greater amplification. It will likewise provide a continuous check on all stages ahead of the 2nd detector. Another useful application is when testing the effectiveness of different receiving antennas. When depending on the receiver alone a 25 or 30 per cent. improvement in the antenna would often times not even be noticeable, whereas even slight improvements are noticeable on a meter.

Figure 2 shows meter and shunt rheostat in plate circuit of final IF stage. Points 2 to 7 show other positions where it may also be connected providing all IF tubes are subject to A.V.C. Points 7 and 8 are positions for a meter of 10 Ma.; in all other places a small range meter should be used because the range must be less than the current drawn by the tube. Positions 4, 5, 6 the meter is at ground potential, but in all other positions is it at High DC potential and the leads should, therefore, be well insulated to prevent accidental contact.

-----  
**NOTICE.**

**Class Manager and Instructors,  
Victorian Division.**

Applications addressed to the secretary before 10th July, Box 2611W, G.P.O., for the positions of class manager, morse instructor and theory instructor will receive the attention of council at the earliest possible moment. These positions carry suitable honorariums. Apply promptly.

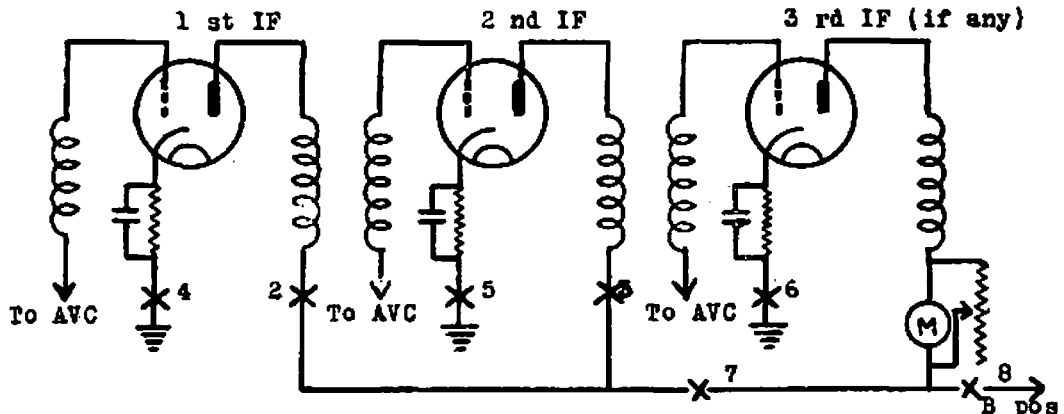


Fig 2.

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# The Countryman's Transmitter

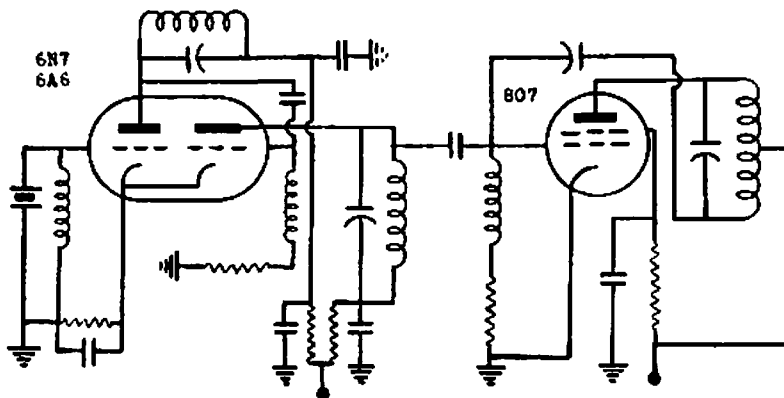
(By N. M. Templeton, VK3HG.)

As the title implies, the transmitter to be described is most suitable for the ham located in the country where the AC mains are not available, and he is forced to use genemotor or vibrator power supply. This circuit has superceded the 6L6-807 rig here at 3HG, and has proved itself to work equally well on all bnds from 80 to 10 with one crystal. The crystal current is less than half that of the 6L6 circuit, and the total plate current of both sections of the 6N7 is less than that of the plate and screen of the 6L6.

The first section of the 6N7 is used as a straight crystal oscillator, while the second half is either a

as a straight amplifier without the aid of a buffer stage. A 6L6G could be substituted where the plate voltage does not exceed 400. The 807 here is neutralised, but a shield between input and output circuits would be just as effective. The neutralising condenser must be exceedingly small, otherwise neutralisation cannot be obtained. A three plate midget with both fixed plates removed is used here, one support for the fixed plates being solely used as the fixed plate. Even then the condenser is wide open.

In order to keep the plate current in the final as low as possible, attention must be paid to details such



buffer, doubler or quadrupler. The output when quadrupling is sufficient to drive the 807 fully, and by again doubling in the 807, with reduced input, quite good output is obtained on ten metres, although the efficiency is not so good as on the lower frequencies. The circuit is straight forward and simple, and no snags need be expected, providing care is taken in construction. The glass type of tube is supposed to give better results than the metal 6N7, but the latter is the only type tried here as yet.

The 807 is probably the best tube for the final, as it is so easily excited. It can be operated on three bands

as short grid leads, adequate insulation in tank circuits, and low C in the final tuning condenser. With plate voltages of 250 and 550, the total current drain is 130 mills. Thus it will be seen that this tube combination is very light on current and suited to the genemotor or vibrator power supply. The heater consumption is only 1.7 amps from a six volt accumulator. Modulation is obtained here with a single 6L6G, single choke Heising, modulating both the screen and plate of the 807 and both depth and quality are quite good, with an input to the 807 of 50 watts.



## Federal and Victorian QSL Bureau

R. E. Jones, VK3RJ, Qsl. Manager.



Edgar Sebire, winner of the listening sections of many recent VK DX contests, has just acquired a valuable impetus to small hour listening. Congratulations, OM, and we trust her yells do not drown the R3 DX.

From all the responses to last month's note, it appears that J8CD does QSL. VK3CX was the enquirer.

Pleased to note Herman Asmus, VK7ET, ex-VK3ET, doing the Block in Melbourne recently. Herman, who is on holiday, looked brand new.

VK3NI, recently returned from a trip to VK6, is enthusiastic over that State, and the fine treatment accorded him there.

3NO, located in Wangaratta, advises that stations in Albury, Shepparton, Benalla and Wangaratta will be on 56 mc. and keen to contact all comers.

QRA and any dope on LZ1AK would be appreciated by this Bureau.

Another who enjoyed his recent visit to Melbourne and Geelong is

Dick Giddings, VK3DG, of Stratford. Dick rushed home in time for the Eastern Zone Convention.

Appropos the Eastern Zone Convention, many of the gang journeyed on to Omeo, and ornamented Bill, 3WE's shack. Heard them all at his mike (except mike shy 3PG). What created the bad surging, Bill?

The QRA of the new QSL Manager for W9 is—W9DMA, 238 East Main street, Caledonia, Minn., U.S.A.

Cards for the undermentioned VK3 stations are on hand.—AP, AT, BD, BF, BG, BK, BN, CA, CO, CQ, DI, DU, EI, EF, EL, EW, FT, FU, FW, FY, FZ, GD, GN, GP, GX, HE, HI, HP, HV, IA, IB, ID, IF, IN, IP, IR, IT, IV, IY, JD, JE, JH, JP, JM, JZ, KK, KI, KO, KP, KT, KY, LI, LL, LP, MJ, NB, NF, NG, NT, NX, OI, OP, OU, PF, PH, PJ, PL, PV, QR, QT, RD, RL, RF, RV, SB, SC, SO, ST, TA, TC, TF, TP, TY, TZ, UQ, UX, VA, VB, VC, VD, VY, VZ, WB, WH, WC, XC, XG, XL, XU, XV, YG, YH, YS, ZB, ZD, ZS.

Cards for the following have "but little time to stay":—3BL, FS, GE, GJ, GU, HB, JL, JN, JS, KL, KM, LD, LM, LX, NF, PN, QA, QO, RA, TU, UF, VN, XE, YM, YZ, YF, ZF.

On the staff of the Monterey, visiting Melbourne in June was W6LJC, A. Wilson, of Oakland, Calif.

VK7LZ reports: "I see the Federal QSL Bureau wants to know of any amateur receiving a QSL from J8CD. Well, quite a few of use have QSO'd him here, and received cards, together with photos. His address is: Dr. Ryoza Nagataki, 2 Yamato-machi, Pyengyang, Korea."

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# Contest Notes

(R. E. Jones, VK3RJ, Contest Manager.)

## VK-ZL 160 METRE C.W. CONTEST

Attention is directed to the rules and conditions of this contest, which will be held on September 2, 1939. See "Amateur Radio," June issue.

## VK ALL-BAND C.W. CONTEST.

Rules and conditions governing this contest will appear in the August issue. The contest will be held during the end of September.

## VK-ZL 80 MX PHONE CONTEST, 1939.

The following are the rules:—

1. All entrants to win prizes must be financial members of the W.I.A. if residing in Australia and of the N.Z.A.R.T. if residing in New Zealand. Any station operated by non-members may enter the contest, but will not be eligible for awards or prizes.

2. The contest shall be by means of amateur radio telephony transmissions on the 80 metre band only.

3. There shall be three sections of the contest, namely:—(1) Transmitting, unlimited hours. (2) Transmitting, limited hours. (3) Receiving.

4. The contest will commence at midnight Saturday, 15th July (New Zealand Standard Time), and finish at midnight Sunday, 30th July, 1939 (New Zealand Standard Time).

5. Seven days' operation only will be allowed, the days of operation not necessarily to be on consecutive days. To come on the air calling for the contest or to send a letter combination as provided in Rule 6 is sufficient in either case to establish for that day.

### Transmitting Section, Unlimited Hours.

6. During the course of each two way contact, each station will exchange QSA, R, reports and exchange a six letter combination. Every log submitted shall contain the following details concerning each QSO:—(a) Time and date; (b) correct call sign

of station worked; (c) QSA, R, reports given and received; (d) six letter combination given and received; (e) points claimed; (f) at end of log total points claimed. The six letter combination shall be arrived at as follows:—

Every station shall select three letters of the alphabet whose combination shall not be in alphabetical order or form a three letter work such as YOU, CAT, etc., and these three letters will form the latter half of every combination sent out by the station. The first three letters will be taken from the last three letters of the immediately preceding QSO.

Example: At the beginning of the contest ZL1ZZ selects the letters AZK and VK3AA the letters QMI. They contact, both for their first contact; ZL1ZZ sends his three letters only, not having worked a station before, and VK3AA does the same. On ZL1ZZ's second QSO his letters will become QMIAZK, and VK3AA's will be AZKQMI.

7. No time limit to be imposed on any QSO.

8. No schedules permitted.

9. No station to be worked more than once.

10. Only one operator permitted per station.

11. All transmissions to be in accordance with the Radio Regulations.

12. Points for each QSO will be claimed as detailed in the following table, which is based on the Great Circle distances to the nearest 500 miles:—

15	35	20	15	15	15	5	ZL 1 and 2.
15	35	20	15	15	15		ZL 3 and 4.
5	20	5	5	5			VK2.
5	15	5	5				VK3.
10	20	10					VK4.
5	15						VK5.
20							VK6.
							VK7.

## Limited Hours.

13. Competitors desiring to enter for this section will be governed by all the preceding rules, but must not commence operations in the contest before 11.15 p.m. (New Zealand Standard Time) if residing in New Zealand, and if residing in Australia, before 11.15 p.m. local standard time of the State in which the competitor is located, on any date. Operation is to cease at 7.15 a.m. on the following morning, 7.15 a.m. being N.Z. or local standard time as the case may be. Stations contacted need not necessarily be in the limited section of the contest. For the purpose of this section only a day's operation as specified in Rule 5 will be computed as being between the hours limiting operation.

14. In submitting their entries for this section in accordance with the detail required in Rule 6, entrants shall state on the top of the log sheets the section entered for.

## Receiving Section.

15. Rules 1 to 12 inclusive of the preceding rules shall apply to the receiving section substitution as applicable "listening" and "heard" for the words "calling," "worked" and "contacting."

16. A log submitted for this section shall be in the same form as required by Rule 6 with the addition of details as to what licensing district the entrant is residing in. Points shall be claimed as set out in Rule 12.

## Awards.

17. A trophy will be awarded to the winner of each section (ZL and VK combined). In addition prizes will be awarded to the winning two stations in New Zealand by the N.Z.A.R.T. and the W.I.A. will award two prizes in Australia.

18. Logs from Australian entrants shall be forwarded to the W.I.A., Box 2611W, Melbourne, and must reach there not later than 26th August, 1939. Logs from New Zealand entrants shall be forwarded to the N.Z.A.R.T., Box 489, Wellington, N.Z., and reach there not later than 31st August, 1939.

19. To each log shall be attached a declaration that the entrant is a financial member of his national society (if such is the case) that he is the only one to operate the station, that he only operated his station for seven days for the purpose of the test.

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## 28 and 56 M.C. Notes

---

(By A. Pritchard, VK3CP.)

Conditions have now settled down, and excellent sigs. from our old friends in the States are being received. The South Africans, ZE1JR, ZS5T, ZS5DD have also shown up between 5 and 7 p.m. on Sundays. The K6 stations have a very active gang, and make excellent round table qso's, with as many as half a dozen a time. The following are the fellows usually contacted: K6QJE, K6PTW, NPO, PIT, PCF, MVV, OQM, PLZ, NKF, QXU, DV and K6MVX, whose half wave ant for tx is in his second story room. K6PUL portable KF on Baker Island is using 8 watts to his final 210 driven by a 6A6, 6L6 modulator and 130ft. of steel guy wire for the antenna. This outfit gives us R7 signals. The usual 2 p.m. fade-out for the States has now increased to 5 p.m., and easy contacts are made up till 4 p.m. 3XP qso'd W5FUS at 4 p.m., and W7ACD was contacted here at 3CP and also at 3BQ at 5 p.m., 7th June. With 7ACD's sig. from his Vee beam, having 6 waves on each leg, the signal was hitting R9 on peaks, although the three sigs. had quite terrific high speed fading, making the R meters appear to have the jitters! These R meters are fascinating to watch on powerful qso signals. VK3DG, of Stratford, paid us a visit a few weeks back; his 20 mx Vee beam has 364ft. 10 $\frac{1}{2}$ in. in each leg, yes, to the half inch, hi! So we can look forward to Dick's arrival on 10. VK3DA, of Elwood, has his rig on 10 and 5, and has R8 sigs. here on either band. Geoff has a 35T running in the final and mod. by Class B, 809's, 10 tube super with 1500 kc. IF's. I received a letter from 3YT. (Many thanks, Allan.) The rig on 56096 kc. has a 6L6G co, 6L6, 6L6, 807 with 50 watts to the final on cw. Transmissions commence at 10 a.m. each Sunday morning with test calls. A super is under construction so the 5 metre gang should turn their beams on Ballarat for a good chance of contact. 3BW,

who is often heard being called. 3XP qso'd W3GQL, who had 6 watts of Portarlington, tells me he is getting plenty of output on 5 metres, too, and a converter using 1851 and 6K8G for both 10 and 5 metres has improved the receiver position. The greatest interest so far with a new development is still centreing around the now famous close spaced beam, 3 elements or more. Burn, of VK3IW, is going to build one at last, too. 3CZ has built a nice looking 4 el. array, and BQ-CP all helped to tune it up with the aid of Max's 115 mill. 100 div. thermo-galvanometer in the centre of a temporary  $\frac{1}{2}$  wave wire 30ft. from the antenna properly. The readings were 4 div. with the ant. alone, 12 div. with the addition of the refl., 24 div. with the 1st dir. added, 50 div. with the 2nd dir. in place, showing the tremendous gain obtained. With the beam left in place on a 4ft. step ladder, and pointed on the States (through rotary clothes lines, trees and tennis court wires) R9 plus was received from W4FLS. The beam is now in place on its 35ft. pole. 3BQ has also added another director on his beam, and so far shows a front reading of 80 div. to 2 div. off the back. 3YP lost his H type beam (it fell down when being excited after a year's rest, hi!) and he is now building a 4 element job with steel conduit, which will be rotated from inside the room. VK5FM has his beam on top of the chimney with the rotating mechanism down same (a hit tough on frosty nights!)

7D is building a trellis mast, also a close spaced beam. W2FU puts over good signals from a 5 el. beam, i.e., vert. J fixed on the pole with a ref. and 3 dir. rotating around it, no feeder troubles with that job! W6NKF has the most powerful phone at present, and uses an H type beam with reflectors, 8  $\frac{1}{2}$  waves in all and motor rotated. VK7 has an active 10 mx ham in VK7BQ, input to a UHX10 portable—4  $\frac{1}{2}$

## Amateur Radio

waves, H type beam ant. On May 6th at 1 a.m. VK3YH, using a 45 doubler final, contacted VE4ARA on cw, det. 1 audio for the rx and 40 mx Zepp ant., showing those old fluke conditions once more. No contacts with other VK States have been made—dueto skip, so please post the dope along, chaps.

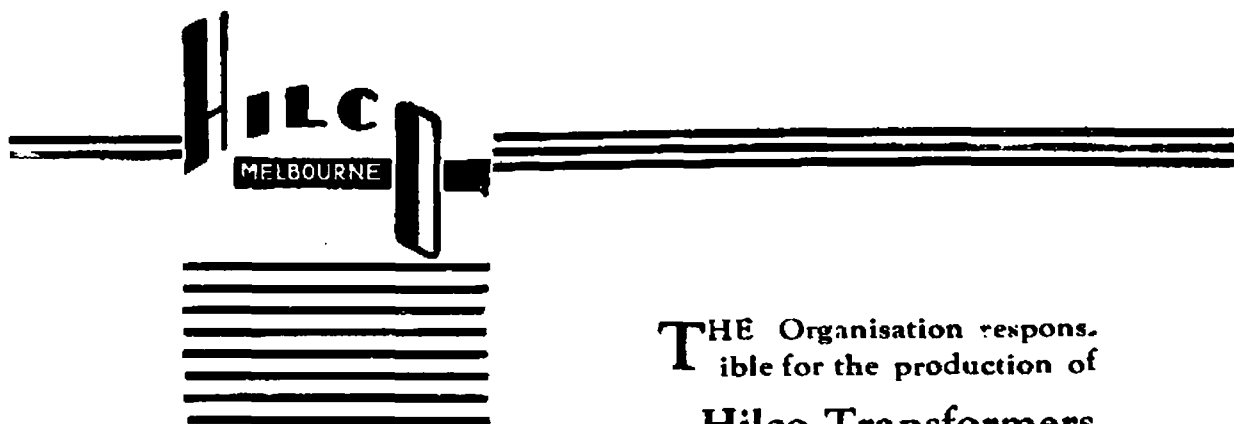
### DX Notes

(By VK3MR)

Conditions are keeping true to form again this winter, making the working of DX a hardship, and all the gang can be heard firing up their rigs on 80 in readiness for a good local ragchew as well as for the forthcoming all band contest. The falling off in conditions is reflected in the few reports received this month, both from fone and cw men, although the Europeans can be worked reasonably well from 3 p.m. to 6 p.m. most days. Despite the terrible qrm on the other side of the world, we still seem to have good contacts. A very unique contact was

effected between VK3BM and G6IA, who is the only ham on the Isle of Man, and it is the first fone contact with VK and the second contact since 1923. The first contact was on cw about 1923. He will be on every morning at 0630 BST on fone and cw, using 14085 kc., and is very anxious to contact Australian and New Zealand hams. This counts as a new country, so is worth sitting on. Those looking for a K7 contact are advised to look carefully through the fone band, as there are several helping to swell the qrm in that region. K7HGM is out for DX, his freq. about 14170 kc. K7ALC also operates at the low end. VK3BM has now increased his list of countries to 67, all on fone except 5. Bruce has increased the efficiency of his feeders, and is getting the benefit. He will be a little quieter now, as he has burnt out his alternator. We notice that old VK2XU is now signing G2OY. VK3QZ is about to make a hole in the bands overseas, using an 807 feeding into a full 7 mc. zepp, which is 75ft. high both

(Continued on page 27.)



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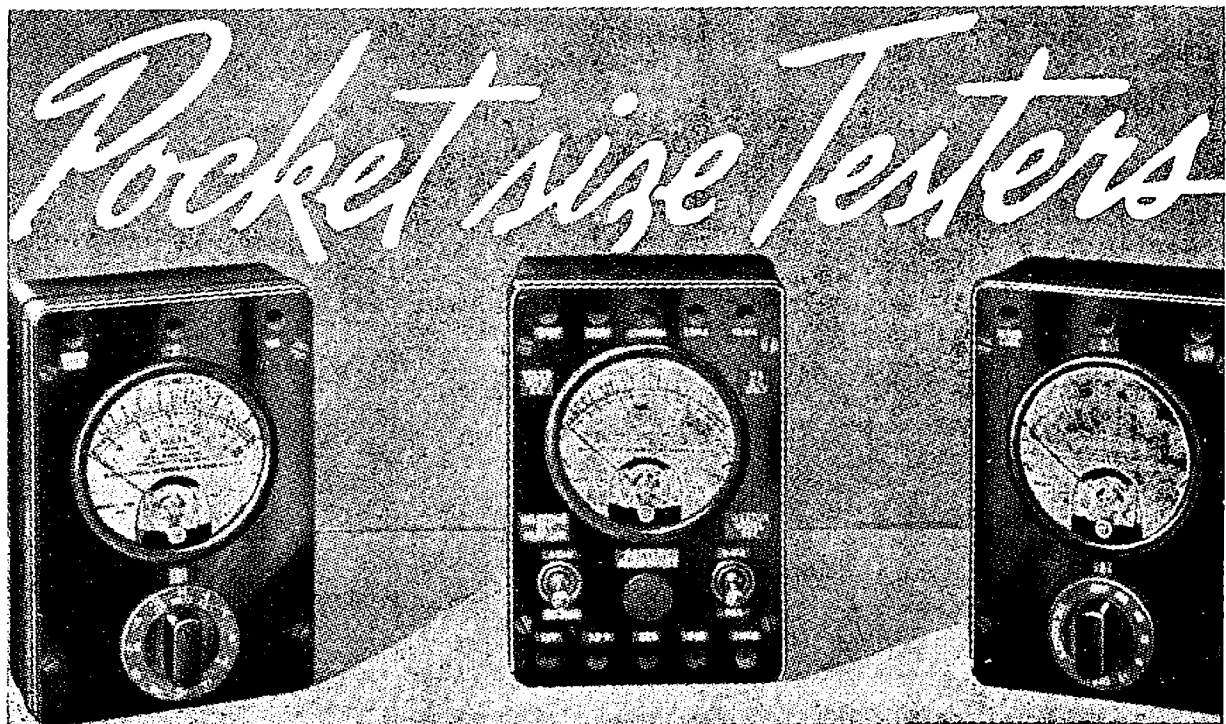
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## Break-In

(By G. Glover, VK3AG.)

Every ham interested in fone BK operation has found that, unless special antenna networks are used, it is necessary to completely separate receiver and transmitter.

To the ham who has facilities and patience to erect both rigs together, we "Dips Our Lid." To the less fortunate this article is dedicated.

Figure 1 depicts system using two B.P. 0/3000 relays, and a third wire or earth return control circuit. The relays, battery and control switches are arranged in the middle of the audio circuit by using line transformers with equally divided windings.

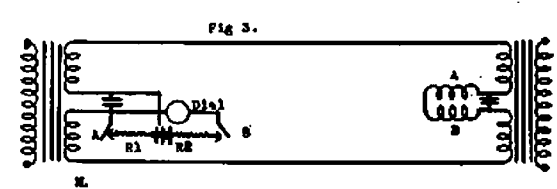
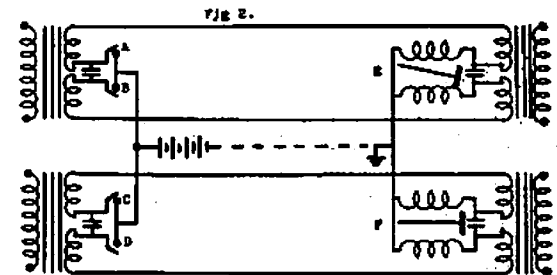
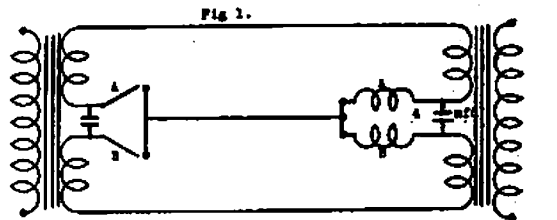
Figure 2 depicts a five wire (or four wire and earth return) super-control circuit. Two audio channels are provided in this case. One for input to modulator and the other for output of modulation over over-modulation indicator.

The actual physical circuit is self-explanatory; however, in this case Type 99 twin winding relays are so arranged that Button A leaves Relay E in position to apply filament current, Button B reversing relay to cut off current. Buttons C and D perform similar functions for plate voltage via relay F. The most important difference between this system and the former is the fact that D.C. only flows while buttons are pressed, thus where interlocked pilot lamps may be used to indicate condition in former circuit, duplicate relays at operating position would be necessary to operate pilot lamps in latter system.

Naturally the former system may be used in conjunction with two audio circuits, and thus provide four control circuits; however, in order to neutralize excitation effect of D.C., both relays on circuit must be excited when circuit is in operation.

Figure 3 will interest the more ambitious ham. It is a circuit devised by the writer to operate over P.M.G. lines between B.C. station and studio of 3YB.

Rotary steppers and relays in conjunction with Dialing system provides an endless number of control circuits. This circuit differs from both the earlier circuits, in that it employs polarized relays (long pole 2,000 ohm) and does not require a third wire or earth return. The



arrangement of the entire circuit is worthy of special note. The two polarized relays are connected in series for a specific purpose. If connected in parallel the back E.M.F. of one relay operates the others, but when in series acts as a quench.

The resistors R1 and R2, each of 1000 ohms are connected in battery circuit to guard against short circuits or to limit current in the event of both circuits being operated simultaneously—under these conditions cancellation of voltage would result in non-operation of either relay.

Dial contacts are normally closed, hence Button B is placed in series with dial to cut-off current when not required.

It serves a dual purpose, that of mitigating against the operation of unit by unauthorized persons being

really its most important function. Although the average person derives pleasure from spinning dial, the idea of pressing a button at the same time does not necessarily occur to them.

Button A operates required relays or circuits after preselection by dialling circuit, and where operation is required to stay put until cancelled, Type 99 relays are employed. A 45 volt light duty "B" battery centre-tapped is ideal for this purpose, and as the current is less than five milliamperes, clicks registered in audio circuit are not detrimental if audio circuit is fed at high level.

In the case for which circuit was devised audio circuit is merely supervisory. The programme channel being entirely free of control elements, apart from programme switching actuated by supervisory circuit. An automatic homing device restores the rotary steppers to normal when required.

There is no limit to the number of functions which a properly designed remote control system may be called upon to perform.

Any of the systems outlined can be adapted to the requirements of the individual case, and may be woven together according to the number of control functions required.

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## Remote Control

(By D. Randall Ayre, VK3KP.)

Readers who happen to live in the city will no doubt have noticed the arrival of the Philco "Mystery Set." Perhaps some of you have visited the dealers handling this clever device, and seen for yourselves the somewhat strange phenomenon of a radio receiver controlled from a distance by a dial on a small box. The chief element of strangeness is, of course, the fact that there is no metallic connection between the control box and the master set. In short, the receiver is remotely controlled by radio.

The control box consists of a low-power transmitter operating in the

range 350 to 400 kc. The transmitter is battery powered and radiates by means of a frame aerial built into the box. Suitable provision for the reception and utilisation of the control signals is made in the main receiver, and altogether, the arrangement is one of the most novel and successful seen here for some time.

However, the incidence of this receiver gives rise to one or two rather disturbing possibilities.

These sets are manufactured in America, and are undoubtedly very fine pieces of design and craftsmanship. Hence, it follows that the control transmitters are very likely carefully arranged to eliminate any interference which might occur in the immediate vicinity of the installation. In addition, the frequency channel used by them is not likely to cause much trouble to anyone.

It is logical to suppose that Australian manufacturers will in due course commence the production of similar devices, since there is no earthly reason why, if the imported article is to be allowed, local firms should not have a share in the pie. Then will follow, more or less inevitably, a position which I venture to suggest may easily become chaotic unless rigidly controlled by somebody. So long as the making and servicing of remote controls of this type is confined to reputable manufacturers all will be well. But ill-equipped factories supplying the cut price trade will soon trail after the more responsible firms. As usual, their products will have most of the refinements sacrificed to cost, and it is all too likely that their control transmitters will be of poor design.

It is easy to see the dangers of this state of affairs, but the trouble in that direction would probably be confined to occasional cases of interference.

The worst possibility lies in the fact that home constructors may by some mischance be legitimately entitled to build these control devices. It is quite certain that, if they do start making them, it will not be long before strange and annoy-

(Continued on cover 3.)



## Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceding publication.

### N.S.W. Division

Magazine Editor, J. H. Fraser,  
VK2AFJ.

#### MAY GENERAL MEETING.

At the general meeting held on Thursday, 18th May, Mr. D. B. Knock (VK2NO) was the speaker, and the title of his lecture was "Present Day Applications of U.H.F. Apparatus." Mr. F. Carruthers was in the chair.

Besides being the business of the general meeting, the lecture was also meant to serve as an introduction to the reorganising of the U.H.F. Section of the N.S.W. Division, and to stimulate interest in those portions of our bands. The lecture was illustrated by photographs, which were passed round to those present. Also on view were quite a few pieces of H.F. gear, including a very fine superhet for 5 and 10 metre coverage.

The meeting was well attended and Mr. J. Moyle entered into the discussion at the close and confirmed some statements made by Mr. Knock, as well as adding a few remarks, mainly about television penodes, which proved very interesting.

VK2TR moved a vote of thanks to the lecturer, and expressed the opinion that the U.H.F. Section should have a flying start. The motion was carried with acclamation and the meeting closed at 10.30 p.m.

#### JUNE GENERAL MEETING.

The June general meeting was held on Thursday, 15th, at the

Y.M.C.A., Pitt street. Dr. R. Healey, D.Sc., F.Inst.P., director of Technical Research at the A.W. Valve Co. Ltd., was the lecturer. His subject was "The Ionosphere and its Relation to Radio Frequency Transmission." Owing to the illness of our chairman and president, Mr. H. Peterson, a vice-president, Mr. F. Carruthers, was in the chair.

In terms that all present could understand, Dr. Healey discussed the whys and wherefores of the Ionosphere. Some of the U.H.F. boys seemed a bit disappointed after the meeting because the probability of DX on these bands was stated to be very remote, at least at the moment, according to present day observations.

The lecturer spoke about the effects that sunspot cycles may have and do have on the propagation of radio waves, especially the short waves between 10 and 100 metres. It would appear that the best period for ten metres has passed for a time and that 20 metres is also on the wane, but that 40 metres may have some interesting possibilities in a year or so.

During the discussion, Messrs. Cooper, Corbin, Knock, W. Moore, Moyle, Lusby and Fraser spoke. Messrs. Lusby and Fraser moved a vote of thanks to Dr. Healey, which was carried very heartily by all those present. In replying, Dr. Healey stressed the importance of keeping records of all work done in the U.H.F. sphere, as well as noting all general weather data, because one never knew lest there may be some connection between the prevailing weather conditions and the best times for U.H.F. transmission. He suggested some form of quarterly bulletin or report on work done and

information gathered. The meeting closed at 10.15 p.m.

## ULTRA HIGH FREQUENCY SECTION. INAUGURAL MEETING.

First meeting of the newly formed U.H.F. Section of W.I.A., N.S.W. Division, was held at the Y.M.C.A., Pitt street, Sydney, on the evening of 1st June, 1939. At a recent council meeting of the Division, Mr. Don B. Knock, VK2NO, was asked to accept the presidency of the proposed U.H.F. section, and the chair was taken by him on this evening. Secretary C. Horne, VK2AIK, was assisted by W. McGowan, VK2MQ, who had been appointed to the assistant secretaryship of the section. Attendance numbered twenty-two, including licensed experimenters and listeners, comprising the following: W. M. Moore, VK2HZ, M. Meyers, VK2VN, M. Lusby, VK2WN, F. Caruthers, VK2PF, N. Gough, VK2NG, H. Ackling, VK2PX, R. Treharne, VK2IQ, R. Flood, VK2BN, J. Davey, VK2YE, J. Fraser, VK2AFJ, E. Dickson, VK2AFM, A. Joscelyne, VK2AJO, S. Weston, VK2AJH. From Taree, N.S.W., came Messrs. B. Eagling, VK2AEY, E. Fallowfield, VK2AKI, and P. Potts. Sydney U.H.F. listeners were Messrs. R. Rutherford and C. Bambury. Others present were K. Woodhouse, F. Burke (Waverley Radio Club) and C. Wilson. The president opened the proceedings with appropriate remarks on the value and future status of ultra-high-frequency experiments along modern lines, with regard particularly to the 56 M.C. band. With the object of ensuring that Sydney area should have available consistent transmissions from a number of stations, volunteers were called for the commencement of a station roster to provide the definite presence nightly of at least one station on the air. Stations scheduled for duty for the following month are as follow:—

Mondays: VK2HZ, 56,000 k.c., C.W. only, from 8 to 9 p.m. Tuesdays: VK2VN, 56,080 k.c., C.W. only, from 8 to 9 p.m. Wednesdays, VK2NO, 56,040 k.c., 30 minutes phone and 30 minutes C.W., 8 to 9 p.m. Thursdays: VK2AJH, 58,320 k.c., phone and C.W., 8 to 9 p.m.

Fridays: VK2MQ, 56,240 k.c., C.W. only, 8 to 9 p.m. Saturdays: VK2IQ, 56,190 k.c., phone and C.W., 8 to 9 p.m. Sunday nights: Open for general contacts and discussions.

In the daytime on Saturdays and Sundays transmission will be on the air from several stations mainly between the hours of noon and 1 p.m. for the benefit of distant stations and overseas, for the reason that experience shows that conditions for possible long distance communication are most likely to be favourable around this period. An important benefit to the U.H.F. section is the presentation by Mr. Rutherford of an epidiascope for the projection of illustrations, diagrams, etc., to enhance lectures. Mr. Rutherford was appointed U.H.F. listener representative for the section. Vice-presidents appointed by nomination are Messrs. W. M. Morre, VK2HZ, and R. Treharne, VK2IQ. It was decided that meeting nights will be the first Thursday in each month. A technical committee was appointed, consisting of Messrs. Lusby, VK2WN, R. Treharne, VK2IQ, with the president as ex-officio member. Matters discussed during the evening were:—

That all stations after completing a telephony contact with other stations should sign off with the station call sign on C.W. This is considered essential as a possible means of identification at distant positions. Where identification may be rendered difficult on speech for various reasons, a C.W. carrier can often be heard at a low signal level, and if keyed would be readily identified. The need for comprehensive lectures was stressed and it is anticipated that no difficulty will be encountered in this respect, both in the securing of visiting lecturers of technical standing, and from the ranks of members. A chain of relay stations is one of the objectives of the section. This will provide more interest for outlying country 56 M.C. experimenters and will lay the foundations of what may eventually be a valuable and more or less secret channel of communication should the need arise. Activities will include mobile, portable, and field day tests. Aircraft co-operation was offered by Mr. P. Potts, of Taree, whose flying activities are done in the Newcastle,

# Amateur Radio

N.S.W., district. One important matter for future consideration is the possibility of a special marine test, involving the co-operation of VK and ZL experimenters provided that arrangements can be made to erect on board a trans-Tasman vessel 56 M.C. equipment with bi-directional radiating system. Such a test would be of great interest to Australian and New Zealand experimenters and world wide amateur radio circles in general.

Many active experimenters expressed their regret at not being able to attend this inaugural meeting, these including J. Cowan, VK2ZC, E. Treharne, VK2AFQ, A. Sutton, VK2EM, N. MacNaughton, VK2ZH, R. Hart, VK2HO, C. Bischoff, VK2LZ, and W. Peell, VK2WJ.

## THE R.A.A.F. RESERVE W/T SECTION.

The R.A.A.F. Reserve W/T Section has received the attention of a large number of members of this Division in both the city and country and although training has not yet commenced in earnest considerable preliminary work has been done and everyone interested seems to be endeavouring to brush up their operating ability. It is anticipated that everything will be in full swing within the next few weeks and all Reserve members are assured of some particularly interesting and absorbing work.

Flashes:—

2WK.—Sorry to hear that you have been sick padre. All the boys hope that you will soon be better again and able to get along to the meetings.

2HP.—Our president has also been ill, but is well on the way to recovery, and should be "R max" again soon. Believe you have gone away for a month's holiday, Harold? Half your luck—I mean the holiday and not being ill!

2AG.—The pirate using 2AG's call sign had better quit. Harold will be on the air before this is in print. The pirate can collect a few dozen cards from Harold, or perhaps they belong to three letter calls and the

guys left the last letter off. Perhaps there has not been a pirate at all, Harold!

2NG has good quality fone on 20. Do you still have that early morning surf, Neil?

2AKI made a flying trip to Sydney for the U.H.F. Section's inaugural meeting.

2AEY also came to Sydney for the same reason and brought with him the flying member of the trio, Peter Potts. Best of luck with your ticket Peter. These three boys came from Taree.

Ex-2TJ is now at Groote Eylandt Aeradio Station. How is DX Roger? Do you make another country for the DX Century Club? Let the boys know your new call sign Roger.

"Thus news i made."

## STATION REPORT.

(2VU Singleton, Geoff. Partridge.)

Five metre xmitter, 6F6 7mc xtal osc., 6L6 quadrupler to 28mc, 807 doubling to 56 mc. Exact frequency 56080 k.c., power 45-50 watts, antenna 2 section vertical "W8JK" with zepp feeders. It is fifty feet high and rotatable through 360 degrees. Receiver is a "VK2NO" converter and an eight tube communications. Transmission times on 56 mc., Tues., Thurs., Sat., Sun., 1915 to 1930, Sun., 100 to 1015 and 1315 to 1330. Transmitting and receiving 1900 to 2030 Sat. and Sun. Receiving 1900 to 1915 Tues., Sat., Sun. Transmissions on slow C.W. and fone occasionally on Sunday night. Is on 7 mc on Sundays and will make skeds with the boys there for 56 mc.

## KEEP THESE DATES FREE.

20th July, General Meeting.

3rd August, U.H.F. Meeting.

17th August, General Meeting.  
Time, 8 p.m.; Place, Y.M.C.A., Pitt street.

## COALFIELDS NOTES.

(By 2KZ.)

The boys from this area had a pleasant day at Newcastle during their trip around the Amateur

shacks in that area, the weather was perfect and everyone enjoyed themselves. The first port of call was at 2BZ. Dave has a nice set up in the rig and using a half wave radiator with a director, the antenna can be reversed in direction by pulling a cord attached to it. Next we came to 2YS—KB to most of us. At Allan's place you see the last word in modern radio, with rotary beam, a R.M.E. 69 rx and a 100T Eimac tube in the final. Will be active very soon now. Off again to Gordon's (2CI), where a good old ham shack is to be found, a half wave antenna, and a nice rack and panel rig in grey steel which looks swell. Is on the air quite regularly and is keen on using a .303 at times. The boys had dinner at the Majestic. After the lions had eaten they moved on to 2UF's shack. Frank loves 10 metre work and has ten countries to his credit using 808 final and reversible antenna. He is a good old sport at any time. Crossing the Stockton ferry we landed at Wal's (2AJF), who has a rotary beam and 6L6 final with 30 watts. Has worked sixty-eight countries in one year, but has a wonderful location with sea at the front door and the river at the back. Good job you don't sleep walk Wal. (How s Nevada Wal?—Ed.)

Leaving Stockton we arrived at 2ZC's shack to find 2HZ and 2VN with Jim. In the shack one saw real ham gear from A to Z. A very interested party listened to Jim explain his gear. Jim cut a record using the boys' remarks for its subject. When you work 2ZC ask him to play it to you; about twenty hams are recorded on that disc. Jim is using 800's in P.P. and an "W8JK" antenna.

Dragging the boys on their way we visited Don (2AES) where tea was served in good old style and thoroughly enjoyed. His rig uses a T20 final and an eight tube super, and plenty of elbow room in the shack. The last stop was at 2AFA's place. Harry has a 809 in the final of his rig, a fine super too. After a chin wag we started for home.

In conclusion we wish to thank 2BZ and 2AES for their fine co-operation in making the trip possible, and we hope you Newcastle boys will visit us before winter ends.

We will give you as good a time as you gave us, and to those who supplied cars for our trip we say we appreciated your kindness and thank you.

## BORDER ZONE NOTES. (VK2IG.)

Activity in this section is still at a rather low ebb and conditions are not helping this either.

VK2AEO has now been transferred to Sydney so we hope to be hearing his sigs from there.

VK2AID was in Albury for the car races on King's Birthday and we learn that he is about the only one in Wagga doing much, but reckon his shack a bit cold these nights.

VK2AP still threatening to get going again, but pretty busy on service work.

VK2OJ getting ready to build a lattice for his beam. Gets out nicely to Europe with the present arrang.

VK2EU is rattling the speakers with his new phone rig and pounds in in VK3 we are told.

VK2QD busy building things, but not on the air.

VK2IG been to VIM and met the boys down there at the institute and beat them to a meter in an auction. DX is a bit skinny at present.

## BORDER DX NOTES.

As we have already remarked, DX is not the best at the present, though on 40 there are a few countries coming through, but we have heard no strange ones there.

On 20 an interesting one is P4CC, who is on the S.S. Arendskerck, a Dutch ship running between Holland and Buenos Aires. Was off the Cape Verde Is. when contacted here. Uses the ship's antenna on 14390, is t9 and r8.

MX3C on 14360 is on irregularly around 1100GMT. with a t9 sig. and the QRA is the same as MX2B. FA is well represented in FA3RY, 14385, FA3WW and FA3NY around 14350 during the early afternoon. YV has also been very active with YV5SB and YV5AE on 14410 and VY1AD on 14350 also in the afternoons. HK5EK and HK5BX were heard only, the former being about 14435. A new VP is VP5SB, but not heard much, and old friend VP1JR

is on a lot on 14400 with VP1DM about 14380. PY1DS and PY1AG straggle through at odd times in the evenings. Among the Europeans few rare ones are heard and only HA3Q on 14420 is mentioned. A contest is now on in CT giving you a chance to contact them. The usual CT chaps in CT1JU, CT1ZZ, CT1IT and CT1PC on the H.F. end of 20. U stations still heard and worked early in the day. It appears that for a lot of VK stations CM and XE are real DX yet, and these can be contacted at about 5 p.m. on 20 and around 9 p.m. on 40. There is CM1AF, 14365; CM6DV t6 on 14360, and CM2SW on 14375; XE1CM there also. LY1BX on 14360; VQ3HHP and VQ2AD around the end of the band with CT1IO. WAZ aspirants have a show now as the VE chaps are coming through and Zone 2 is represented by two VE's and a VO, though they haven't been worked here yet. VK2EU reports having worked MX3H and MX4J on 40 metres, together with numerous W's and an odd K7.

## Victorian Division

### NOTICE.

All members of the Victorian Division are asked to keep the evening of 25th July clear. The annual meeting of the division will be held on the night at 8 p.m. in the rooms at 191 Queen street. All members are asked to attend.

### KEY SECTION NOTES. (By 3OC.)

That faith in human nature, and belief in the honour and integrity of his fellow men, which was hitherto part and parcel of your correspondent's outlook on life, has been rudely shattered. In other words he has been practically knocked down and robbed. It all began as a result of the remarks in last month's notes touching on the lack of remuneration forthcoming from the Magazine Committee in exchange for the compilation of this monthly screed. Some days after publication your correspondent was approached by the Editor himself, wearing a friendly

smile (which has since been recognised in its true light—a cunning leer) with the information that as it would appear that the entire success of "Amateur Radio" was dependent on the efforts of your humble scribe, it had been decided to let him in on the ground floor so to speak, and that he was on half the profits of the magazine for the past financial year. Your correspondent expressed his thanks in his usual courtly fashion, feeling that genius had at last been rewarded, and hurrying away went as far as to pay one or two of his more pressing creditors a few shillings on account. Imagine his horror and amazement on discovering that the magazine had actually shown a loss over the period mentioned, and instead of a share in the profits, your correspondent was actually in the red, and in order to square the account it will be necessary to produce at least seven more monthly epistles. Nothing so depressing has happened since your correspondent put 1250 volts on the filament of an Eimac 50T.

However, life is like that, and we newspaper men fight on, as you should know if you attend your local talkie theatre regularly. Although whether the gangsters they bring to book are in the same class as the abovementioned shyster is a moot point.

Hearty thanks are extended this month to WU, whose grid modulation is back in the junk box. SG and UM are still working on exciter units, the former a three stage job with band switching, which will be the forerunner to a general rebuilding programme. UM is also in the throes of a rotary beam, as is YP, who promises it will be a real 28 mc beam. BQ alleges that he has a real 4 element 28 mc rotary beam, while ML says that he will probably build a better one still—imported. Seems to be some competitive spirit about this beam business, must build a far superior one myself and go on fone!

IW has hypnotised the local BCL's into believing that the fone QRM was caused by enemy spies reporting to their respective countries the number of telegraph posts in his street, the task being made easier by the fact that original complaints were to the effect that the speech

was in a foreign language. Result is that IW's key now reposes under the table with the rest of the junk. IG is another of the rotary beam brigade, and has a 14 mc three element beam on a ninety foot mast. Let's hope it works as well as it looks. In this welter of set-ups for a trapeze act it is refreshing to note that KR for one has gone back to fundamentals again, and is using a clothes line as an aerial on 14 mc.

UV has finished his new transmitter and is on the way with a receiver, as is IK, whose 5 metre rig is working, but minus receiver. XJ is not so active these days, wedding bells being so imminent that by the time the printer has finished with this it will be all over. Disappointed with conditions on 7 mc, RN is rebuilding 5 metre rig and hopes to be on very soon. QV is puzzled as to why an aerial six feet short, and with odd length feeders which radiate, still manages to get out. The great thing is not to worry about things like that—only worry if they don't get out.

UC is rebuilding, and hopes fone soon. Your correspondent hopes not. ZU has just completed his hundredth QSO with QK, while XZ, between pounding brass at VJR is working some choice DX. QS reports the works down, and DP has been drowning worms as a change from fishing for the elusive DX. Don't know the story behind the rumour that UH has abandoned crystal grinding in favour of the car towing business, but there it is. Finally R.J. still thirsting for knowledge, wants to know if there are any CW men on 28 mc!

On looking back your correspondent is of the opinion that perhaps he has been a bit hard on the fone men from time to time in these notes. They have borne up bravely, and perhaps the fact that your correspondent has not been on for so long that he has forgotten what little he knew of the code, and if he ever stages a comeback it will of necessity have to be on fone, may influence his decision not to slate the fone men in the future—much!

## U.H.F. SECTION.

(By 3JO)

Section meets third Tuesday each month at the W.I.A. Rooms.

## Further Schedules.

This month we are able to record some further skeds by the Melbourne stations:—VK3RI, mod. osc., 59 mc, Monday evenings 2000 to 2200, recorded programme interrupted every half hour to listen for calls. VK3YL, c.c. 56.0024 mc., Wednesday evenings from 2000 onwards to be spent listening and calling if not working other stations.

## Activity.

During the past month or so we have noticed increased activity on the band and seldom a night passes without someone being heard. 3VL, 3IP, 3IN, 3IK, 3RZ, 3ZD and 3LX are all newcomers and 3NB and 3LG have shown increased activity. 3NB is still the same fine c.c. station, but in a new location, and 3ZD is using his 10 mx final stage as a doubler for 56 mc work, the others using mod. osc. types of rigs, but all are expecting to change to c.c. in the near future. 3DA has altered his rig

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to a three stage job with a 10 mx xtal and 35T final, the result being R9 signals in most places. He is also using a converter in front of his s.w. receiver and reports difficulty in copying the mod. osc. rigs owing to frequency modulation. 3ZD also uses a converter. These converters seem to be the answer to the 56 mc receiver problem, but it will be necessary to stabilise our transmitters before they can become really effective.

### Competition.

VK3KP has generously donated a tube of a type suited to ham work as a prize for a competition to be held shortly. As details of this are not yet completed we cannot publish them fully at present, but one of the requirements of the competition will be to originate a message of at least fifteen words stating a good reason why 56 mc should be more popular. As there must be a different reason for each contact, intending competitors should polish up their thinking apparatus in addition to their rigs.

### EASTERN ZONE NOTES. (3DG-3VG.)

The Eastern Zone Convention which was held in Sale on 10th and 11th June proved a real success and everybody present had a most enjoyable time. It was rather disappointing that members of the executive and more of the city boys were unable to be represented as they missed a swell time. Too much cannot be said for the organising at the Sale end, which was in the capable hands of Stan Johnson, 3XH, who carried things out to the slightest detail. After a prodigious dinner the annual meeting of the zone took place and then an excellent agenda paper was thoroughly debated upon and discussions took the meeting to zero hour. 3WE Bill Williams was again elected to the office of president, and no better secretary could be found than 3PR Ron Jardine, who carried out his duties most satisfactorily during the year. The zone notes and publicity were entrusted to 3DG and 3VG. On the Sunday morning the gang paid a visit to 3TR "B" Class and the Maffra Beet Sugar Factory, not forgetting 3SS, and then made the return trip to Sale via Stratford, calling at 3DG's en route. After lunch the balance of the boys who did not have to leave for home early,

paid a visit to 3GI Gippsland Regional and we hear they had a very interesting time.

Doings of the Gang:—

3DG.—Had modulator burst into flames at conclusion of last zone hook-up!

3DI.—Jim active when not qrl yl on 40 mx.

3EA.—Evan, we want you in the zone hook up ob so come forth and present yourself at the time and date mentioned under.

3GO.—Graham still building, what a house or a super rig, let's hear of it soon old fellow.

3HK, 3HT, 3PG, 3IG.—Took such a liking to the old man of mountains that they followed him back to his hamlet and enjoyed the real 3WE hospitality as extended when temp. is around the 40 degrees mark. Hear they should have made the trip in summer months when it tastes even better.

3HZ, 3XZ.—Only know they are alive by sounds from 3UL. What are you doing, chaps.

3IC.—Ken, we welcome you to the fold, has only received call and had to be told that limit of power was only 50 watts.

3PR.—Ron with 3HG Neil of Western Zone fame had the job of conveying 3WE safely home in the blue streak and can she streak. Ask 3IG, who was following.

3VG.—Howard decided to show 3WQ and 3JX Stratford by night and after touring for an hour and a half to cover five miles from Maffra, strangely enough found themselves back in Sale. It must have been real good stuff at the dinner the night before to hold good that long.

3SS.—Perhaps Keith can account for the actions of 3VG, WQ, JX seeing they were last seen and heard of from 3SS.

3NO, 3LY.—Will both still be busy accounting for things at "B" Class since a recent visit by a certain lot of fellows.

3IL.—Bob we are all looking out for you ob, so please break the silence.

3JZ.—Another of those silent workers—we want you in our hook-ups, so what say.

3QB.—Sorry to hear Jack you were unable to come up to Sale on 10th.

3IO.—Although now in VIM makes back to Stratford every chance he gets so that speaks a lot for Eastern Zone.

3XH.—Stan a busy man, but with convention over might be able to spend more time on the air. Has a swell antenna up now at new qra so yf can have clothes line to herself now. Anyway it worked Stan.

3WE.—Bill busy taking stock of what the gang left after recent visit. 3HG, 3PR wanted to see snow and after the way they proved themselves as alpine men, Bill is looking for something better than 5,000 feet on empty stomachs to let them loose at.

Zone members please note that on and after Thursday, 6th July, the Eastern Zone weekly hookup will be held every Thursday night at 8 p.m. All active stations are requested to come on and swell the present numbers.

## NORTHERN ZONE NOTES. (VK3BM.)

3YK and 3KR have recently visited the zone, and 3MR is still with us. The wet weather has restricted "Snow's" activities fortu-

nately, as 3ZK, 3JG and 3OR have not been heard since he called on them.

3HX.—Still gets out on 80 mx, but Tom is busy with various public duties, and this damp weather doesn't agree with him.

3ZK.—Is off the air while he builds an fb band-switching super. Jim recovered his 801 from Snow's pocket!

3EC.—Works Yanks on 20 phone o.k., but has muc trouble from harmonics of 3SH alongside.

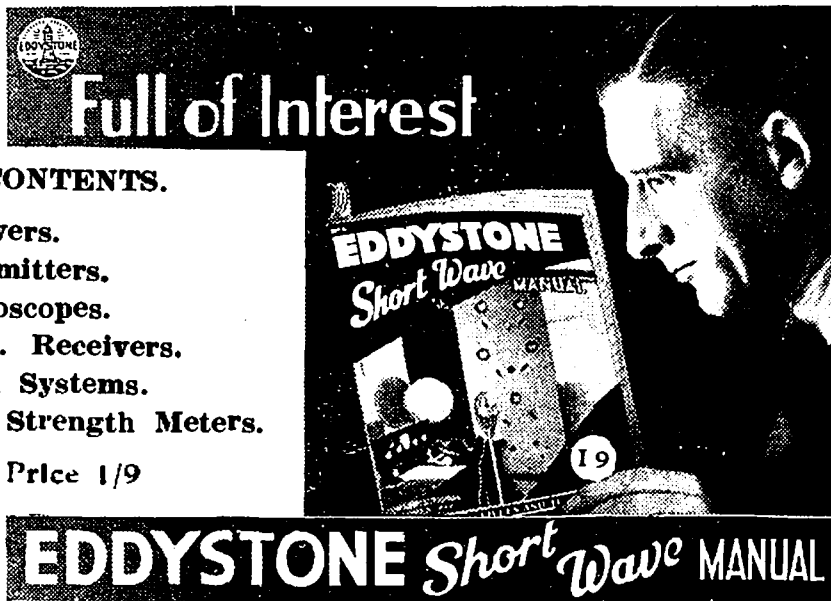
3QZ.—Proved himself a he-man when he climbed 3BM's 121 footer, putting up steps as he went! Graham has built a motor-generator to boost the D.C. mains voltage, and now has 40 watts input. Worked his first Yank on 40 recently.

3TL.—Treb. has an elusive bug in his Rx.

3OR.—Is discussing 20 mx beams. The junior op. is becoming interested in the mike.

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3JG.—Johnny is busy packing a good crop of citrus. Why not join in the Sunday a.m. hookups, om?

3EP.—Is not on the air from his new QTH yet, but has taken up xtal grinding again.

3DU.—Doug. is willing to cooperate in 5mx tests from Mt. Tar-rangower.

3CE.—Roy has rebuilt the modulator with good results, and is now contemplating a new super-het.

3WN.—Greatly improved his phone by using a 2A3 as modulator, but finds that it is hard on the "A" battery.

3FF.—Jock is interested in V beams. With all that space, why not, om?

3KY.—Puts out the maximum of signal with the minimum of rig. May be changing his QTH soon.

3EF.—Has invaded the 80 mx band. Tough on the local BCL's.

3BM.—Busy clearing out the wreckage, but to give Snow his dues, the sigs do get out better on 20 since he altered the feeders. Twelve new countries to prove it. Many antenna experiments under way here.

The Northern Zone has a phone hook up on 80 mx every Sunday at 9.30 a.m., 3TL on 3509 k.c. being key station. All members are invited to join in.

## WESTERN ZONE. (VK3HG.)

3DA.—New ham in Hamilton and very keen. On staff of local "B" Class station.

3SZ.—Quite active on 7 mc and pleased with results of new dynamic mike. Gets on 3.5 mc for weekly hookup.

3FA.—Not heard very much, but believe he visits Hamilton for certain reasons.

3XG.—Hopes to be on 3.5 mc for weekly sked soon.

3WT.—Still keeping Geelong on the map.

31I.—On 3.5 and 7 mc as usual and after seeing the V beams at 3HG is thinking of something in the same line.

3OW.—Has the super going quite well and is on occasionally when not flying.

3TW.—Active on CW!

3CK.—Heard on both 3.5 and 7 mc when time permits.

3HG.—Attended Eastern Zone convention and afterwards visited

north eastern stations in company with 3PR.

## Queensland Division

(By 4ZU.)

The June meeting was fairly well attended, a couple of old faces being noticed, namely 4AP and 4WT. Mr. M. Gabriel delivered a very interesting lecture on "The Electron Theory," which was well received by most of those present, although a couple of hams wilted under the strain. A visit to the "Courier Mail" and its associate broadcasting station is contemplated for the latter part of this month.

On Sunday, 16th June, a Direction Finding Field Day was held by the Queensland Division. About two dozen hams took part and a good time was had by all present. Some of those participating were VK4's AW, WL, UR, UU, JP, AP, CX, PX, RY, JB, RT, JF, FJ, ES, ZU, RC, GU and others. The day proved highly successful as far as results went, all parties succeeding in tracking down the hidden station at Everton Park, Enoggra, which was operated by 4RY and 4JB.

4VJ.—Heard working a few Yanks, etc. How's the rotary going, Vince?

4PX.—Arthur tells me he is tiring of fone, so it looks as if the good old key will be pounded again shortly.

4GU.—Inactive, but has a QRP rig just in case the bug bites.

4FJ.—Picking up stray Europeans on 20 mx. Save a few for me please Roy.

4HR.—Our 5 mx champion not heard very much lately. What's going on Tibby?

4JF.—Finds it easy to work Europeans, but the Yanks are more elusive.

4RT.—Busy with work, etc., but the grass will stop growing a little soon John.

4JB.—Has staged a comeback. How about some of you other old timers following Oscar's example?

4OK.—Working DX consistently with about 4 watts. Nice work!

4AW.—Arthur lying low, but just waiting for those contests to come round.

4CW from Warwick heard on again.

4RG also on 40 mx chewing the rag with the boys.

4CN, the man from Cribb Island, heard on quite a bit. Here's a new country for you Century Club hounds. Give Jim a call.

4JP.—George has promised to donate a tube to the ham dragging in the most new members. Nice work om.

## BUNDABERG ZONE.

4JJ.—Jim very QRL servicing sets and no time to get the 43's heated up.

4OJ.—Verdi has a new super and it is fb indeed. Brings in all stations on the air and a few which shouldn't be on the air.

4HP.—"Herbie High Power" still doing a hit on 40 mx and helping 4JJ get the bugs out of B.C. sets.

4XR.—Eric is going to chop 4XO's antenna down because of what he put in May issue of A.R. Oh Yeah! 4XR has a great antenna; was meant to be full wave on 20 mx but when he reached 50 odd feet he couldn't find any more pieces of wire to join on. Reckons the clothes line will suffer for the extra feet.

4XO wants to swap anyone a 30 valve for a bucket of AC current. Is fed up with DC—any offers? Just got QSL from Russia and 4XR heard him whoopee at the other end of the town.

Say, all you country men! 4FJ, our zone manager, is trying to hear from some of you, so don't be backward in giving Roy a call—it's up to you!

## South Australian Division

(VK5JT.)

Well chaps, until the council appoints an assistant secretary to handle publicity matters, yours truly will endeavour to fill up the allotted space here.

In order to bring the S.A. Division of the W.I.A. into line with the other States it was decided to incorporate. A copy of our rules had to be lodged with the application, so it was a good opportunity to give them the "once over." This has now been done and copies will be issued to members in due course.

The new constitution provides for the following officers:—President, vice-president, secretary, assistant

secretary, treasurer, and membership organiser; these officers also act as the council.

The first general meeting under the new rules was held on 24th May, when there was a good attendance. The following officers for the ensuing year were elected:—President, J. Kilgariff, VK5JT; vice-president, H. N. Bowman, VK5FM; secretary, R. D. Elliott, VK5RD; treasurer, E. P. McGrath, VK5MO; membership organiser, J. McAllister.

Council meetings will be held on the first Wednesday and general meeting on the third Wednesday of each month. It is intended to make the general meetings more interesting for members by deleting all routine business matters, making lectures shorter, etc. Subs have been fixed at £1 for city and 10/6 for country members. This includes "Amateur Radio" free for the year.

Some of the country members were asking what we do with our cash. Well practically all of it goes for rent and Federal per capita payments. It is essential that members have a room for their headquarters, hence they must pay for the privilege. This applies equally to country as well as city members.

It must be stressed that at present the commercial interests are endeavouring to take more of our ham bands. The only way to resist them is by being organised. The radio authorities will take no notice of any protests from single hams, but they will take note of any organisation that puts in objections. Therefore, I urge upon all hams the necessity of joining the W.I.A. The more members, the more cash we have and the better we can fight, so send in your entrance form, fee and subs right away.

The P.M.G.'s Department has informed us that they are prepared to use hams and their stations in the event of a telegraph line breakdown. We are now organising an emergency network so country members willing to assist in emergencies send me full particulars of your gear. The most essential thing is to have an emergency power supply in case the mains fail. The next is to be able to send and receive messages quickly and accurately. The department has stated that all traffic handled must be in C.W. I am acting as emergency

control officer in the city at present and skeds for traffic handling practice are held at 10 a.m. Sundays. Write out a few messages, call me, and obtain the necessary practice. Use procedure as per A.R.R.L. Handbook.

## R.A.A.F. RESERVE WIRELESS SECTION.

The O/C informs me that the present hold-up is due to old members not returning their equipment to the Air Board. New gear will not be issued until this has been put in. A waiting list will be kept of hams wishing to join the Reserve, so send me your name and when a vacancy occurs you will be notified.

The following hams are active at present:—Fone: VK5DW, BF, BU, CR, DI, GF, GM, JU, LB, LC, PN, RE, GS, RK, TR, XA, RJ, LK, C.W.: VK5YL, AK, AF, FM, GK, HN, JT, KJ, KL, LD, LL, LP, LW, MK, ML, QM, RL, TL, TX, WK, ZU, RN, BL, JM, AJ, LT, ZZ, KM, BC, LD.

73, JOE.

## Western Australian Division

Meeting night: Second Tuesday in the month at 8 p.m. at headquarters.

As predicted by your humble servant, the annual general meeting held at the conclusion of the ordinary monthly meeting (13th June) proved long, argumentative and (in patches) heated.

The ordinary meeting lasted about routine business only brought to light two matters, 6NL's announcement that the 6WI modulator should be finished and in working order within a fortnight, and the report of the 40 metre Home QSO day, won by 6AF (35 points), with 6WZ (33) and 6KW (31) the runners-up. 6FL made highest country score with 27 contacts—very fine work.

At 8.2 p.m. the annual meeting was opened and the president (6MW) gave his address on the year's activities, stressing the improved position not only in W.I.A. affairs, but in amateur and experimental activity generally. The membership of the Division was at its strongest with a total of 200, of

which 70 were full members, the remainder enrolled as students. The activity on the bands was keener, students' progress was encouraging and the division's finances were in a better condition than at the last annual general meeting. 6MW then went on to mention the help he had received in his term of office from the various officers of the Division, with special reference to the hard work and enthusiasm of the secretary treasurer, 6KS.

There followed the financial report, balance sheet, auditor's report (including a reference to the high rental paid in proportion to the division's income), QSL officer's statement, and finally the report from the scrutineers on the council ballot. 1939-40 councillors are 6KS, 6CB, 6WH, 6GM, 6BB, 6LW, 6CX, 6MW, and 6BW. Students rep. on council, 6BB; C.M.I.C. officer, 6CC; QSL, 6CP; monthly letter, 6WH; technical director, 6GM; station manager, 6NL; traffic, 6AF; librarian, 6EI; auditors, 6IG and Mr. Nind; publicity, 6WZ.

After T.D.S. and Field Day committees had been elected 6FR formally moved that the subscription be increased to one guinea for full members (metropolitan) and 15/- (country) with 6CX as seconder. The discussion was loud, long, involved, often dry, sometimes misleading and at all times (to a few who made their feelings all too obvious) boring. When the vote was put the motion was defeated by 18 votes to 12. After some further questions and answers regarding traffic, a "missing" practice key and that long-promised a.c.-operated code oscillator, the meeting was declared closed at 10.55. Members departed amidst cries of "See you at the dinner!"

Undamped waves:—

6AF noted receiving many offers of escort home after receiving his 809 trophy!

6FL is very pleased with his new antenna. Also tickled with the 80 ohm feeder. Works all sorts of DX and is now active on 28 mc.

6MN heard on 7 mc and seen about the city with a toothless (but still cheery) grin. Spends spare time listening to technical lecturettes (per 7 mc fone) and is greatly perturbed about his buffer stage, hi!

# Amateur Radio

6MW still leading a busy life of business and radio.

6BW travelling for his firm. Say, Mick, about these commercial traveller yarns . . . ?

6LW sat for the broadcast ticket recently. Good luck Wally!

6CC unjustly accused in these notes last month of being mover of motion re sub. Apologies, Bob—and to Fred (6FR) the mover. Both heard on 7 mc fone at odd intervals.

6WS heard on 7 mc recently. Has presented a framed "composite" of his station to the Institute—very nice, too.

6BE gets on 7 mc C.W. now and then with fb sig and fist. His fellow conspirators, 6AJ and 6YB not heard these days. The former is busy with flying course; the latter—stout fella—has given me a regular order for "A.R."! Next, please.

6GA has solved the problem of good speech quality at low cost. Now uses dynamic speaker (permag. type) and single-button mike with blended outputs. No fooling, the idea really works! Cheaper than xtal mikes, too.

6CP once more our QSL man and that in itself is a guarantee. Should be busy now that he has added five mx to his worries. Clarrie is a specialist in radio-active wire netting and horizontally-polarised chickens, by the way!

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## Tasmanian Division

### NORTHERN ZONE.

(By VK7LZ.)

Owing to the fact that all the members of this zone were busy this month at the Launceston Radio and Electrical Exhibition, our activities were practically nil, and I therefore have nothing to write about. However, if the editors will grant us space, we hope to send in an account of our activities at the Exhibition, together with a photo of the stand; if possible by next month's issue.

A special meeting of this Zone was held in Launceston on 15th June to discuss the proposed amendments to the Constitution of the Tasmanian Division of the W.I.A., and after a lengthy discussion we decided on several amendments, which we hope will be of value both to this Zone and the Division in general.

All the stations which were off the air owing to having gear on display at the Exhibition are now getting back on the air again, so I hope to give you more news next month. However, conditions here are terrible at present, with next to nothing in the way of DX coming through, so if any mainland stations are after VK7's they will find us all on 40 metres of an evening, where 7GJ, 7KR, 7XL, 7LZ and 7DS may be heard most evenings, the first four mostly on phone.

VK7JB is now back in Tasmania this time here in the north, so we have another active amateur to add to the ranks. Before long we will give the mainlanders a run for their money in DX contests, etc., so look out, fellows. We'll be trying.

Well more news next month, and don't forget our meeting for July at the Y.M.C.A. on the last Thursday of the month at 8 p.m.

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(Continued from page 11.)

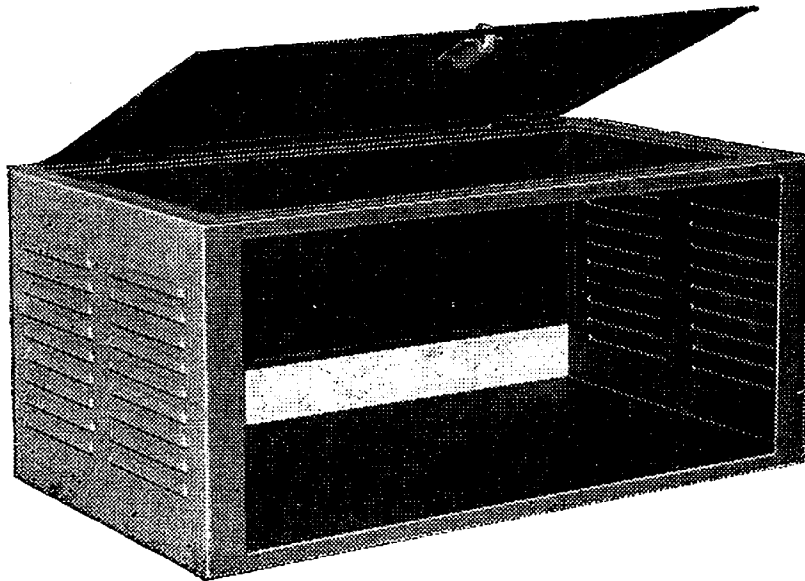
ends. George, VK4JP has now worked 32 zones, 80 countries on fone and 87 on fone and cw. His best this month is SV1CA on fone. The SV being on 14280 kc. He also reports PK6CI on cw. Let's have some more dope, gang. Happy hunting. 73. Snow.

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ing signals will be appearing all over the place.

It would be retrogressive and unwise even to suggest that these devices should be banned on this account. But it is essential that they be controlled, and controlled rigidly, otherwise every Tom, Dick and Harry who feels so disposed will be making transmitters at home, and we may even see some of the more enterprising of these gentlemen entering the piracy business.

Naturally, the possibility of occurrences such as those prophesied above has arisen in America; we find in a recent edition of QST that legislation has been introduced there prohibiting the use of these control devices for any form of communication. It is not stated, however, whether any provisions as to authorised frequencies were laid down, nor was the question of interference mentioned.

I therefore suggest that the following measures should be taken here to safeguard the interests both of the Amateurs and the public:—

(a) Restriction of the right to make and sell these devices to those who can show proof of their ability to do so properly..

(b) Restriction of the control transmitters to certain suitable frequency channels.

(c) Application to these units of regulations similar to those dealing with interference by Amateurs, i.e., that the owners of sets producing interference shall cause the interference to be removed from whatever service it happens to be affecting; failing that, that the use of the particular set causing the trouble shall be prohibited until such time as it shall cease to interfere.



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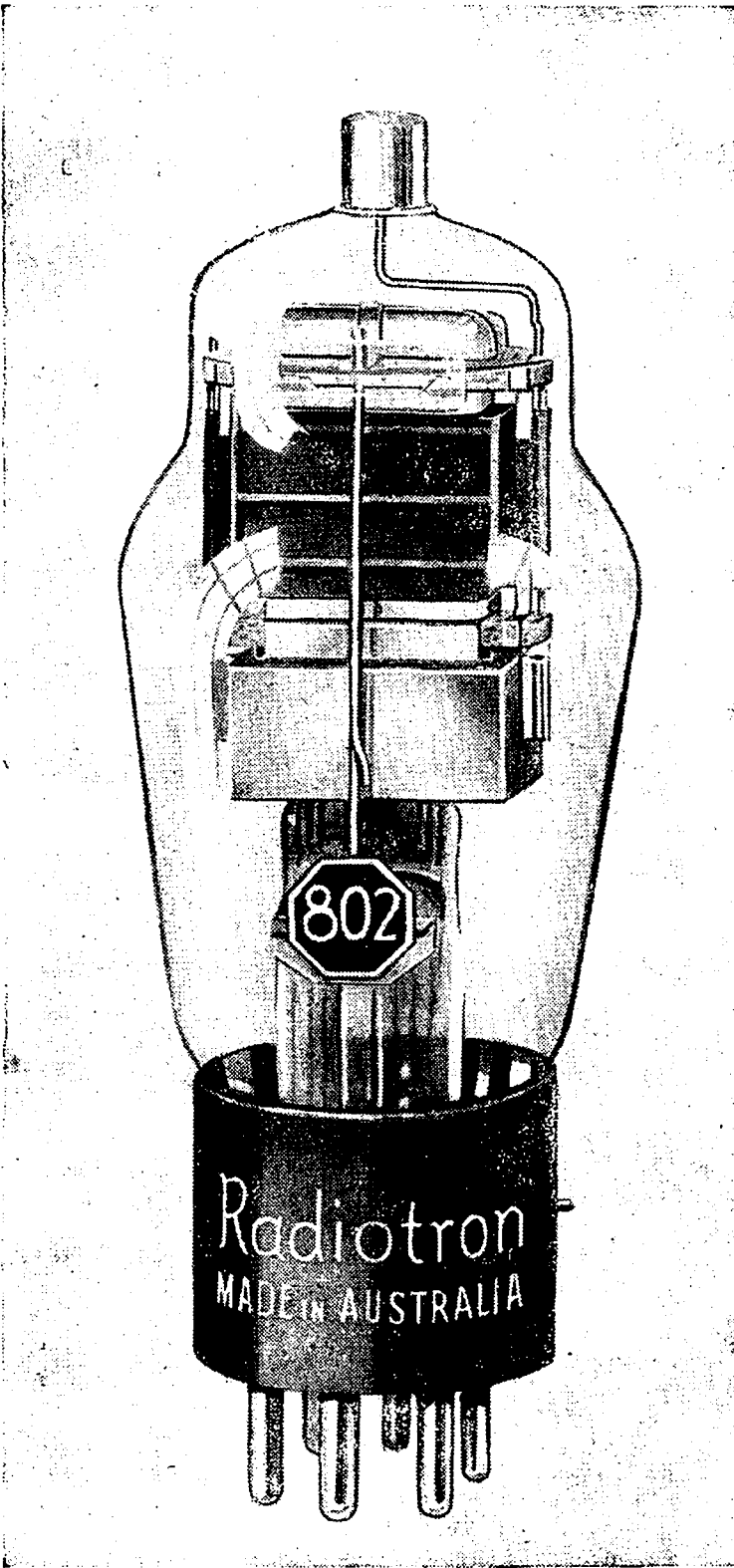


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W. R. GRONOW (VK3WG),  
Editor.

R. H. CUNNINGHAM (VK3ML)  
Technical Editor.

C. SERLE (VK3RX)  
Notes Editor.

V. E. MARSHALL (VK3UK)  
Compilation.

H. N. STEVENS (VK3JO)  
Distribution.

L. T. POWERS (VK3PS)  
Secretary.

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### *Accounts Department.*—

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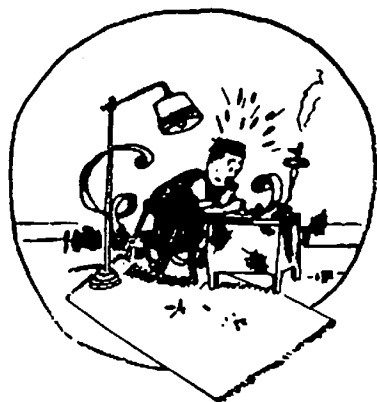
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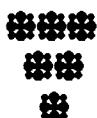
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## EDITORIAL



Let us have a round table talk about our Magazine. With this issue "Amateur Radio" ends its sixth year of publication, and with this issue it enters a new era of progress. For some time we, as a Magazine Committee, have realised that the publication was not improving and, as the old paradoxical adage says, "He who stands still, retreats." This issue shows you some evidence of what may be expected as a result of the Committee's new policy. A new style of printing and a new set-up will, we hope, make the Magazine more attractive and readable and at the same time more saleable to advertiser and reader alike. In addition, an alteration in advertising policy will give a service to the firms who make the Magazine commercially possible that we hope will be evident to you in increased advertising in the coming issues. Stating the position baldly, two new full pages of advertisements allows two new full pages of reading matter. But it is obvious to all that those new pages will not remain unless the advertisers see adequate return for their outlay. Therefore, it must be reiterated yet again, it is the bounden duty of every Ham to support wholeheartedly those firms who advertise in our pages.

Remember, too, that "Amateur Radio" is still an Amateur Magazine, run by Amateurs in their spare time, therefore, if the Committee increases the number of pages, you must help to fill them, as well as read them. The Northern Zone of Victoria has the right spirit for, as a start, a promise has been made of an article every month, and that spirit is further exemplified by this addenda to the first article, "You may condense it, rewrite it, cut out what you like, or even burn it!"

But what of the future? The Federal Executive meets on the same night as the Editorial Committee, thus Federal information will be published "straight from the horse's mouth" as it were. We could go on ad infinitum, but why spring all the surprises at once? Just one more, though, an increase in Magazine size to a larger page is contemplated, but not until next January issue, so that those of you who bind each volume, will not have two different sized Magazines to contend with in one year.

There is the Committee's side, now what do you think? As a regular reader of your own Magazine we ask two things of you—your co-operation and constructive criticism.

# The Perfect Half-wave Radiator

(Application of the coaxial type aerial for the higher frequencies).

By Don B. Knock (VK2NO) M.I.R.E. (Aust.)

President, U-H-F Section, N.S.W. Division W.I.A.

Aerial design, coupled with the trials and tribulations of feed-lines has been for half a lifetime of amateur radio, a source of suspicion and perplexity to the writer, as it has to countless other seekers of sky-ward seekers of R.F. efficiency. Through the years of DX, most of us have graduated from the Marconi against ground aerial system, through the Zepp, single-wire fed Hertz, Y matched impedance, twisted pair doublet, shorted stub arrays and the whole gamut of radiators in the search for the ideal, suited to one's particular location. When it comes to the DX bands of 7, 14, and 28 M.C. it can be said in most cases, that all of these systems can be made to perform well in a general sense, provided that the simple fundamental resonance at the desired frequency is carefully attended to. Because fairly good results can be obtained with aerial systems cut to Handbook chart lengths and slung almost anywhere above ground, one is apt to take things too much for granted, and to assume that things could not be much better. Results with aerials at the usual DX frequencies can lull one to a false sense of efficiency, for the reason that when signals peak between DX positions, something will be hearable and workable even with a "clothesline" aerial. DX is even worked on "cockie's wire fences," but only when "conditions" are just so. It is not until the serious experimenter delves for a few years into the why and wherefore of ultra-high-frequencies that he begins to realise just what is meant by aerial efficiency. His findings teach him much that enables similar application to lower frequency

work. Because of compact dimensions, aerials of 56 M.C. permit a great deal of interesting work with field meters and some encouraging and often disappointing results may be shown thereby. In the course of the past nine years, the aerials tested at VK2NO for 56 M.C. communication are legion and include plain radiators and high gain beams of all

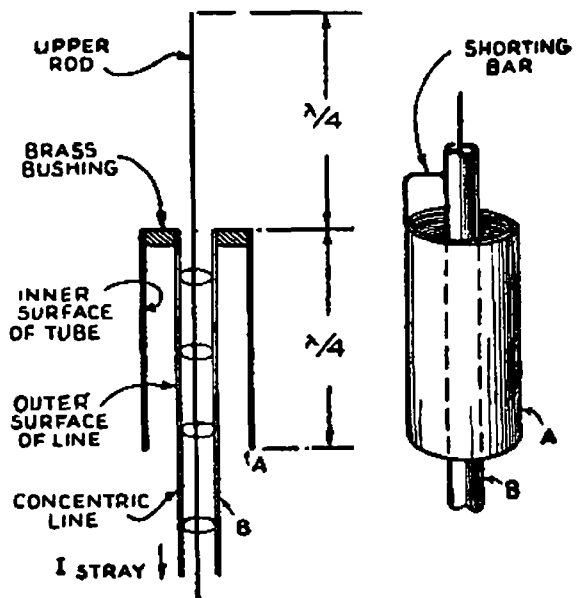


FIG. 1.

descriptions. In recent years had favoured either two-half waves in phase fed with matching stub and non-resonant spaced line, or Kraus's W8JK close-spaced two-section array. Both these give bi-directional coverage with a theoretically fair gain over a single half-wave radiator and consistently good results were obtained with such arrays. Nevertheless, there has always been the knowledge that despite all care, inevitable high loss has been present

in the feeder systems, especially where feeders must necessarily be lengthy. Some idea of the loss in the once popular E01 type cable at 56 M.C. can be obtained by quoting an experience with aerials at VK2EM, Killara, N.S.W. Here it is necessary to employ 80 feet of feeder to reach any array placed on a rotating arrangement above a tree. In order to resonate a shorted stub W8JK array, it was intended to excite this temporarily from a plain doublet placed adjacent. 80 feet of this twisted pair was connected to the doublet and stretched out from the shack. It was found that little or no R.F. could be found in the doublet from a three stage transmitter using PP 809's in the final with 50 watts input. The cable absorbed the lot. The load on the final remained the same with the doublet removed from the line, showing that the line was doing all the loading. Lengthy twisted pair was from that time ruled out for feeding 56 M.C. aerials. Fair results were obtained with a 600 ohm line using 14 B and S with 6 inch spacing, but standing waves could never be completely removed. The reason for this is that 6 inches spacing is quite an appreciable portion of a half-wave at 56 M.C.; a point not likely to be realised by many. The answer to all 56 M.C. aerials, and aerials for any of the higher frequencies, was solved when engineers of the W.E. Co., U.S.A., recently evolved a highly efficient form of coaxial aerial; simple in construction and undoubtedly the closest approach to the perfect half-wave radiator.

Following on the introduction by W.E., an article in "QST" dealt with this aerial in practical form and as Bassett concentric cable is now available in Australia (from VK 3ML) it was decided to make one up for 56 M.C. forthwith. This was done with very satisfactory performance, with the result that the W8JK vertical at VK2NO was immediately discarded. It was found that with the coaxial aerial 30 feet above ground, signal reports in all directions gave a very definite increase over the W8JK with its computed gain of 5 Db. In fact, W.E. claim a gain of 8Db over a "J" aerial for the coaxial in all directions. Having

reached this stage it was decided to back the coaxial with a half-wave reflector spaced a quarter-wave behind and controlled for 360 degree rotation from the shack. At Burwood, on the other side of Sydney, from VK2NO, VK2IQ made painstaking signal measurements on the signal, using a superhet receiver with calibrated S meter. The coaxial aerial plus reflector gives a gain of 40Db over receiver background there. In S strength the reading is R10 with aerial full "On" and the front to side-minima drops to R5. Figure 1 shows the electrical arrangement of the aerial, and be it understood that concentric cable feed is imperative. Bassett type

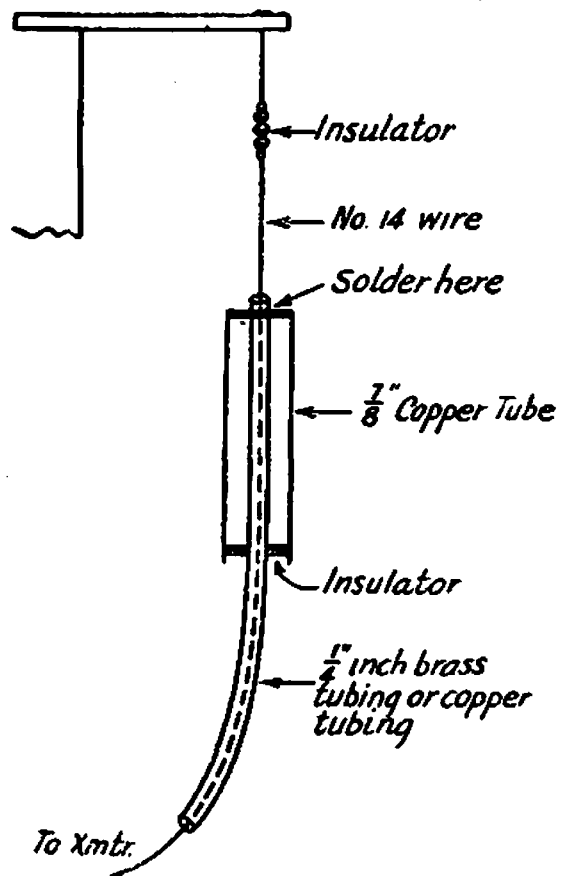
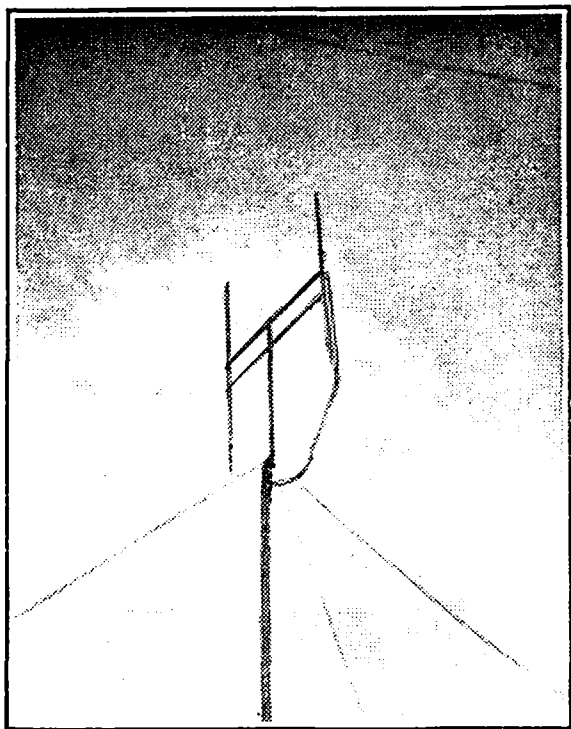


FIG. 2.

64/200 cable is used and the loss in 100 feet length is neither here nor there. A new circuit element is evident in the cross section of the aerial in Fig. 1. The enclosed sheath of the transmission line acts in conjunction with the inner surface of the larger surrounding tube to form a short-circuited quarter wave concentric line. Characteristics of this section of line cause an extremely

high impedance to be created across points A and B. This is equivalent by simple analogy to a High Q anti-resonant circuit which isolates the pole below point B from the aerial, and reduces stray pole current to a minimum. Thus the aerial can be erected on a metal pole without fear of loss. When this aerial is supplied with power, its centre is at minimum potential, the top at high potential, and the bottom of the tube at high potential. The presence of the High Q anti-resonance circuit allows this high potential to exist even in the immediate proximity of the transmission line!

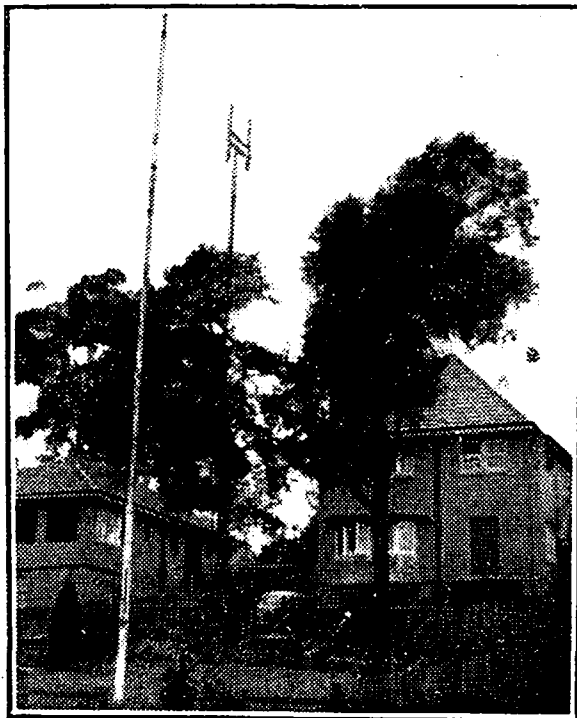


THE ARRAY AT VK2NO.

In other words "away with feed-line troubles" for that is just what it does. Fig. 2 shows the "QST" suggestion for construction, and as may be seen, it is simplicity itself. The top quarter-wave wire is the continuation of the inner conductor of the concentric feed line which passes up coaxially in the large metal tube forming the lower quarter-wave section of the aerial. In the writer's case, this is of seamless 22 gauge seven-eighths inch brass tube, and 4 feet long. At the top of this tube, where the inner conductor emerges, the outer conductor, which is the braid in the Bassett cable used, is connected to the seven-eighths brass

tube. This is done by making a brass disk to fit the top, with a quarter inch hole to pass the Bassett cable through. The braid is then soldered to the disk. At the bottom, is a disk of Bakelite to hold the cable centrally in the tube, but in the writer's construction, two more such disks are included at intervals inside the tube to ensure centralisation. That is all there is to the aerial and the easiest way to arrange it is by using a 9 feet length of 1 inch square timber with stand-offs. Strip metal clamps around the brass tube hold it securely to stand-offs.

A word about lengths for various frequencies. It is found that chart lengths for a half-wave aerial in free space are less than 5% for the frequencies stated with this aerial. Four feet each side puts the aerial resonant around 56,050 K.C. One way of getting dead tuning is to make the brass tube 3 feet 9 inches long and to make a sliding sleeve over the bottom end, which can be clamped in place when adjusted



VK2EM's ARRAY.

The top wire can be pruned in the usual manner, or if  $\frac{1}{4}$  inch copper tubing is used, that also can be made less than 4 feet long, and a sliding extension used. It was found that with an input of 150 watts to the crystal controlled TX at VK2NO on 56,074 K.C. that although an

R.F. meter in with the inner conductor of the Bassett cable showed  $1\frac{1}{2}$  amperes, it is impossible anywhere along the line to get an indication of R.F. in a tuned absorption meter using a 2 volt pea-lamp or sensitive neon tube. That means that the R.F. is going just where it is wanted. Fig. 3 shows the array in the sky at VK2NO, and Fig. 4 shows a similar array made by the writer for VK2EM. Although VK2EM is about 17 miles from VK2NO and well screened, his signal is so powerful that everything needs to be shut down on the 7 valve superhet. Same applies at the other end. VK2LZ 60 miles away in the mountains says that the signal from both stations simply folds up the tuning eye on his receiver and all Sydney and district 56 MC stations report amazing increases in signal strength. As may be seen, the systems are used vertically polarised, all N.S.W. stations us-

ing vertical in preference to horizontal systems. Other stations now under way with coaxials are VK2MQ and VK2VN. Apart from 56 MC it will be at once apparent that the idea can be applied with great advantage to 28 and 14 MC. A semi-vertical coaxial for the latter band will be in use at VK2NO in the near future. A word of warning. A half-wave reflector spaced a quarter-wave behind has little effect on the centre impedance of the aerial, but if the method is applied to close spaced arrays, then Bassett cable of lower impedances than 64 ohms must be used accordingly. The writer can say without fear of contradiction that no previous form of half-wave arrangement can compare with the coaxial. It is well worth the small time and trouble taken, and with the cable now available at very reasonable prices, expense is no real obstacle.

## Goniometer Rotation of Beams

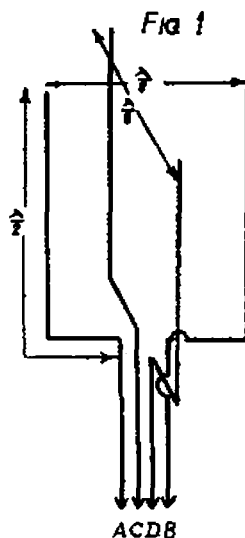
L. H. Vale, VK3WK, 2ACU.

Of recent years, the swing to beam antennas, both as a means of reducing interference in reception, and to increase the transmitted power in a given direction, has been most marked, especially on the higher frequency bands. Those experimenters who are able to erect stationary beams and use switches to change their direction of transmission and direction are indeed the most fortunate, but one has only to listen on the 14 mc. band to realise how many are not so fortunate and therefore use small antennas which can be mechanically rotated.

These rotatable beams are very effective, but have quite a few disadvantages. The tower must be very rigid and strong to take the weight of the bearings and other apparatus necessary for the rotation of the antenna, there must be some means of rotating the feeders to the antenna without detuning the aerial or altering the impedance of the feeders, and it generally takes quite

a while to rotate the antenna even a few degrees, especially if it is situated far from the operating position.

A system of electrical rotation, wherein the actual antenna is not rotated but rather the power supplied to the antenna, should offer quite a few advantages. A similar





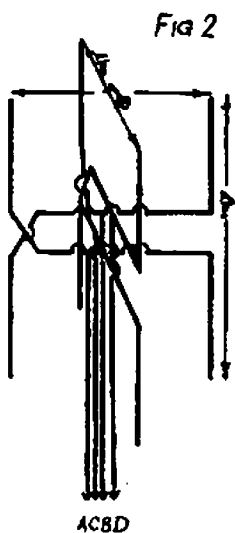
system is used for direction finding. Instead of using a rotatable loop aerial, two perpendicular loops are used and are connected by four equidistantly spaced feeders to two correspondingly vertical coils, in the centre of which is another coil which is mechanically rotatable through 180 degrees. These three coils form an apparatus which is known as a goniometer.

A scheme, which the writer has had in mind for some time, employs four vertical half wave elements with about eighth wave spacing—as shown in Fig. 1. The elements are correspondingly connected to four equidistantly spaced feeders which are taken to the shack. If it were desired to use the antenna on two frequency bands, the feeders could be taken from the centre of the

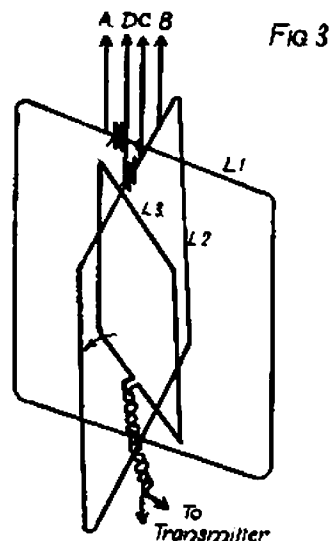
and would also have the advantage of being a two band antenna.

The four feeders are connected to the corresponding ends of the coils in the goniometer. In the goniometer constructed, here for 14 mc work four turns were used on the feeder coils, and the search coil was 2 turns and connected to a link in the plate coil of the transmitter. The coils were parallel tuned. A schematic diagram of the goniometer is shown in Fig. 3. Coils L1 and L2 are mounted perpendicularly to one another and the search coil, L3, is rotatable through 180 degrees so that it may be set parallel to L1 or L2 or at any intermediate point.

The explanation of the operation of the system is as follows:—In Fig. 4, the feeders are disregarded and the radiators are considered as being



radiators—as shown in Fig. 2. This would be a practical way of erecting a rotatable beam for the 7mc band,



connected directly to their corresponding coil on the goniometer. When the search coil is parallel to coil AC

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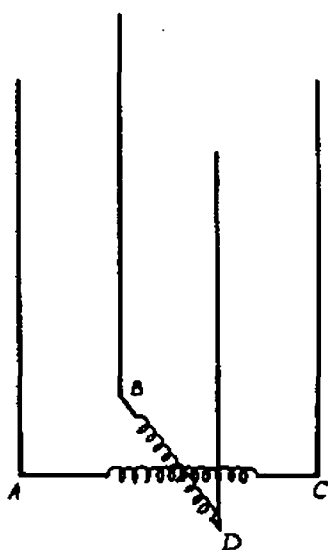
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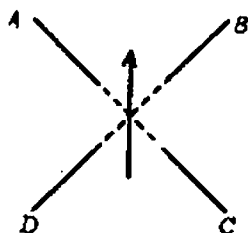
the elements A and C will act as a vertical W8JK beam, and radiate bidirectionally in the direction of a line passing through the elements A and C. Because in this position, the search coil is at right angles to coil BD and the feeders and radiators are equidistantly spaced from each other, radiators B and D will be inoperative, when the search coil is rotated 90 degrees so as to be parallel to coil BD, by the same reasoning the radiation direction is also rotated

FIG 4



90 degrees so as to be on a line passing through radiators B and D. If, however, the coil is only rotated 45 degrees to a position shown in Fig. 5a. The currents in radiators A and B will be in phase with each other, similarly D and C also, but A will be oppositely phased to D and B to C. The radiation, therefore, will be in a direction parallel to a line passing through B and C. It will be noticed that the direction of radiation corresponds exactly to the position of the search coil. If the coil is ro-

FIG 5a



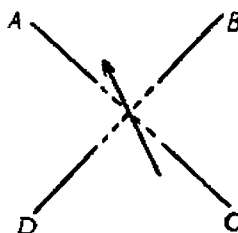
tated to the position shown in Fig. 5b so as to be nearer coil AC, radiators A and C will be more out of phase than B and D, and the radi-

ated energy will again be in its corresponding position in respect of the search coil. It will, therefore, hold that the radiation of the antenna, which is bidirectional, can be rotated to any direction by rotating a coil on the operating table.

If the antenna, shown in Fig. 2, is used, some means such as tapping the coils would have to be applied to the stationery coils on the goniometer to allow for band changing. The method of antenna tuning would, of course, depend upon the length of feeders.

In experiments made, it was found

Fig 5b



necessary to have variable coupling of the link in the transmitter coil.

Although the writer had constructed a beam, as shown in Fig. 1, and a goniometer, it was not possible to erect the antenna at the time, and so the system has not been given a practical try out. Although most of those who have been told of the idea were keen about it, the writer does not know of anyone who has tried it, and so would be very interested to hear of practical results.

**BIASED.**

By VK30C.

To begin with, perhaps a few words of explanation regarding this monthly feature would not be out of place. Both the Magazine Committee and the Council of the WIA refuse to be held responsible for any views expressed herein, and for my own part I would like to make it clear that any reference to persons living or dead, events real or imaginary, is purely co-incidental, and in any case, whatever it is—I deny it.

Having settled that, the idea is to tear things to pieces with an ardour worthy of a better cause. And what more appropriate start could be made than on "Amateur Radio" itself. Forgetting the unfortunate issue of October 1935, the magazine was first presented to an unsuspecting public in October, 1933, and by

process of effluxion of time and simple arithmetic is almost six years old. With the potential support here in Australia for a journal of this type, it should by now be a much better and more comprehensive publication than it is, more especially in view of the fact that overseas contemporaries with more restricted fields than we have, can do immeasurably better. You know the reason as well as I do. If you are a CW man, spend a fraction of the time you use producing those gorgeous key clicks and breathtaking yoops, in telling your fellow hams through the magazine, how you do it. They would like to know. If you happen to be a 'Phone man, use this medium to reassure your fellow men that the noises you produce are not caused by gargling close to the microphone with the gain full on. They won't believe you, but it would make interesting reading. If your tastes lean towards the erection of eighty feet masts supporting wierd and imposing arrays, write an article on how you single handed erected them, even if actually it

took ten men and the local fire brigade to avert catastrophe. In other words, do something to make "Amateur Radio" the magazine it should be.

I had the pleasure of seeing a copy of the last Examination Paper for the AOPC the other day, and judging from that fact that I could have managed about 60 marks myself, should think that 3RX will manage to push quite a decent percentage of his class through. The paper struck me as being a particularly good one, inasmuch as it covered practical ham problems and conditions. Congratulations to whoever set it.

There is a certain satisfaction in the "I told you so" attitude. The current issue of QST, in which particulars are given of a General Amateur Poll on the question of whether 7200—7300 kc should be opened to 'phone, brings to mind that a few months ago myself and a few others put up a scheme, which included 'phone restriction to this channel on 7mc. However, prophets are invariably without honour in their own countries.

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## 28—56 MC Notes

A. Pritchard, VK3CP

Ten metres has been rather erratic the last few weeks and the band went rather dead before last month's notes came out in print. Some days the W's came through from 7.30 a.m. with good strength, although around noon seems to be the sure time to get through at present. The VK's came up in strength due to this short skip, although VK6 was the only easy distance, and VK6MW had an outstanding signal during the late Sunday afternoons. The outfit has a 6A6 co-doub (6L6 doub. 5mx) 807 final at present—2 808's gave up the ghost and were used as the final. The modulator has a D104 xtal mike into 6J7, 6L7 automatic mod. control, 6J7, 45's PP, 809's Class B—coupled by a UTC, S21 universal Mod. transformer. A nice line up is complete with a National FBXA and pre-selector for receiving. Our old friend, Keith, of 3HK, is back on 10, and is in great demand with his 3 inch cathode ray tube, so there should not be any excuse for over mod. 3HK has been testing different automatic modulation control circuits and finds the set up given in June "Radio" (USA) very effective, and on an average it is possible to turn the gain up, as much again. The circuit given will take the States kilowatt jobs, so an '80 for the rectifier is OK as far as VK is concerned. Briefly the system consists of a voltage divider across the output of the Class B transformer and the  $\frac{1}{2}$  wave rect. valve across a portion of this resistance. The rectified bias voltage is fed through a resistive decoupling net work back to the 1st valve in the amplifier, the 6L7's injector grid. The system gives excellent results and doesn't cause noticeable distortion. VK4 has 3 active hams in 4HR, 4AP, and 4JP, the latter often being heard here with good strength. Feeders are coming into the light for improvement and the co-axial cable seems to be gaining favor. K6PLZ and K6OQM

both outstanding sigs, use this  $\frac{1}{4}$  wave matching system. The former has an outside tube  $1\frac{3}{8}$  inch diam. and inside tube  $\frac{1}{2}$  inch diam. and 85 per cent. of an electrical  $\frac{1}{4}$  wave long, i.e., 7 feet  $2\frac{3}{4}$  inches long for a freq. of 28650 KC. The latter uses an outside tube of  $9/32$  inch diam. and a No. 9 B & S copper wire, or No. 11 SWG and a  $\frac{1}{4}$  wave long. Two new signals on the band come from VP3CO and K5AT, and are often heard called. The Africans ZS5DD and ZS5AW are the only stations heard during the month. VK3HG, using 30 Watts to a 807 final, is doing very well on 10, although being approximately 180 miles from Melbourne, is in the skip for us. VK2 has active stations in 2ADT, 2QM, 2AFE, 2GU. South Australia has 5IT and 5GM. All VK's are requested to keep a look out for VK9VG in New Guinea, although no information is at hand regarding times, etc. 56MC is settling down to definite schedule time in VK2 and last month's AR gives all necessary information. With so many xtal controlled outfits on, it's a wonder interstate contacts have not been reported. In VK3, Dennis of 3KP, is giving a helping hand and the details of an interesting contest for 56MC should be in the mag. very shortly. Herb, of 3JO, contacted 3LT of Carrum and 3BH of Mornington, tone keyed sigs for each end. VK3ZD is xtal controlled on 5 and a long wire antenna is giving excellent results for general coverage. 3EH is also xtal on 5 and the outfit has 802, tritet co, 807, 807, 809 pa on 10 or doub 5 and 809 final; Ern is doing very well. 3KP brought back on HRO from the States and, as he had no suitable receiving antenna, an interesting comparison was obtained here at 3CP for both receivers. R meters compared very favorably. The HRO is certainly a beautiful job.

**FEDERAL AND VICTORIAN QSL BUREAU.**

R. E. Jones, VK3RJ, QSL Manager.

For a write-up in a large U.S.A. weekly, the Radio Editor, Owen P. Callin, Ohio State Journal, Columbus, Ohio, U.S.A., desires photos and station dope and descriptions from the following VK stations 2ABV, 2TO, 2NO, 2HP, 2ZC, 2BK, 2UC, 2ADT, 2CC, 2ADU, 3HG, 3BZ, 3EN, 3XJ, 3XP, 3XG, 3ZU, 4KS, 4HG, 4KH, 4JP, 4KO, 5CS, 5JS.

VK9WL, Boz 2, Salamaua, New Guinea, has been appointed QSL Manager for New Guinea.

Gil, of VK9VG, complains bitterly of the tactics of W stations with E.C.O., who tune their rigs to the station 9VG is working.. W's are keen to work VK9, but Gil likes a bit of variety in his DX. Such tactics show poor sportsmanship.

VK9VG is on 28 MC, but does not state his frequency. He states he has called plenty of VK's without result. He is visiting Australia next year and now possesses a new NC 101X with a DB20 pre-selector and

also a RME frequency expander. Desires reports on his 28 MC sigs.

VK3ZS, although licensed, has not yet been on the air. Someone, however, has kindly worked a few countries for him.

The newly formed Radio Club, Uruguayo, has for its office bearers, CX3AY, Presidente, CX3BM Secretario. Its official station is CX2BU, whilst its QSL Bureau is Box 37 Montevideo, Uruguay. Not having VK4JU here to translate for me, my knowledge of Spanish does not permit giving further details.

Snow, of VK3MR, acquired two doses of 'flu whilst holidaying with VK3BM, and came home to convalesce. Suburban farmers apparently soften by intimate contact with civilisation.

Mac, of 3XZ/3UL is busy saving up to erect a "Poor Man's" rotary. Has planted a few bamboo shoots to provide the necessary spreaders.

Jim Corbin, VK2YC, N.S.W. QSL Manager, has moved his QRA to:— 78 Maloney Street, Eastlakes, via Mascot, N.S.W.



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# Contest Notes

R. E. Jones, VK3RJ, Federal Contest Manager.

## VK-ZL 160 METRE C.W. CONTEST

Attention is directed to this contest, which will commence on September 2, 1939. See "Amateur Radio," June issue, for Rules.

### VK-ZL DX CONTEST.

The annual VK-ZL DX contest will take place during October next. The contest is under the control of the N.Z.A.R.T. this year and rules will appear in the September issue of "Amateur Radio."

### THE ALL BAND VK C.W. TROPHY

This contest will be an Interstate Test and not an individual one as previously held.

This Trophy will be competed for annually, and will be awarded to the State having the highest aggregate score of its first three competitors.

Rules are as follows:—

1.—The contest is open to all licensed amateurs, but only members of Wireless Institute are eligible for awards.

2.—The times of the contest are as follows:— From 1400 E.A.S.T. Saturday 16th September until 2359 E.A.S.T. Sunday 17th September 1939, and from 1400 E.A.S.T. Saturday September 23rd until 2359 E.A.S.T., Sunday 24th September, 1939.

3.—The test is of contact nature and with each contact a 10-letter cypher must be exchanged before a point is scored.

4.—Stations with which an entrant can work are stations in Australia and New Guinea, outside the competitor's own State.

5.—Any station can be contacted once on each band, each week-end.

6.—States are as follows:—VK2, VK3, VK4, VK5, VK6, VK7, VK8 and 9 combined.

7.—Licensed power must not be exceeded, and infringements of the Postmaster-General's regulations may mean disqualification.

8.—One point is scored for each cypher exchanged. Total points are

then multiplied by the number of States worked (as defined in Rule 6).

9.—Bonuses will be added to the score after multiplying (rule 8). The bonuses are as follows:—

Contacts on 160 MX — 60 points for each State worked.

Contacts on 80 MX.—20 points for each State worked.

Contacts on 40 MX.—20 points for each State worked.

Contacts on 20 MX.—30 points for each State worked.

Contacts on 10 MX.—60 points for each State worked.

Contacts on 5 MX. — 500 points for each State worked.

The sum of bonuses plus those points scored as in Rule 8 will constitute the grand total score.

10.—The cypher to be exchanged will consist of 10 letters and figures. The first five are to be chosen by the entrant, the remaining five being the first five of the last station contacted.

Example:—Station VK7LL works VK2OL for his first contact, and the cypher given by VK7LL would be XMPZ1AAAAA, and that given by VK2OL would be QCHV1AAAAA. The cypher given by VK7LL to the next station worked would then be XMPZ2QCHV1. The figure shown as the fifth in the cypher corresponds to the number of contacts had by the station, in the contest. When the number of contacts reaches double figures the fourth letter is dropped and a figure substituted, thus—XMP10. When the number of contacts reaches three figures a further letter is dropped and the figure substituted. Thus VK7LL would use for his 105th contact XM105 plus the first five of the last station worked.

11.—All logs must reach the Contest Manager, Box 2611W, Melbourne, by October 25th, 1939.

The logs must contain:—

(a) Time, date, band and call sign of station worked.

(b) Cypher sent and received at each contact.

(c) Points claimed, contact points and bonus points.

12.—The scores of the three leading competitors in each State will be totalled, and the State having the highest aggregate will be awarded the Trophy. Certificates will be awarded to the leading two stations in each State.

13.—The decision of the Federal Headquarters Executive of the W.I.A. will be final and binding in all matters.

14.—No contact on 56 MC to be between interstate stations situate less than 60 miles apart.

#### FOURTH ANNUAL GERMAN DX CONTEST RULES.

The DJDC 1939 is based upon radio contacts between European amateurs at one side and overseas amateurs on the other side as it did in 1938. The traffic again consists of two parts:

- (1) DX-QSO between Europe, German included, and overseas, with exchange of serial numbers.

There is a difference between DX-QSO

- (a) Overseas—Germany
- (b) Overseas — Non - German Europe

QTC Reports only can originate from DX-QSO as under (b)

- (2) QTC-QSO between Europe outside Germany or Overseas at one side and Germany at the other side.

Time: The four weekends of August, starting with the 5th. Each weekend from Saturday 1200 GMT to Sunday 2400 GMT.

Frequency bands: All amateur bands. There is a special band scoring that time. The German amateurs are unable to transmit on 56 mc, 3.6-4 mc and 1.75 mc bands. Off band working causes disqualification.

DX-QSO — Contacts between Europe, Germany included and Overseas. The idea of the DJDC is to get a maximum number of such contacts. Six-cipher serials are to be exchanged. The first three characters mean the RST (or RSN) with

# AEGIS

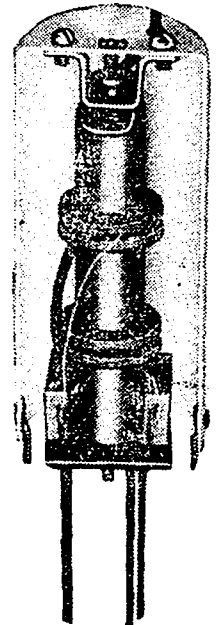
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which the other amateur has been received, the last three mean the number of the DX-QSO. The first DX-QSO has been number 001, then 002, etc.

The general call for the contest is CQ DJDC. Amateurs who don't wish to participate are requested not to answer CQ DJDC, to avoid wasting time of the participants.

Only one DX-QSO is possible between the same stations per weekend as per frequency band.

QTC-Traffic: Each DX-QSO between European stations outside of Germany and Overseas may be the origin of a QTC-Report for each of the two partners of the respective DX-QSO.

By QTC-QSO between Non-German and German stations such QTC-Reports may be sent to Germany (and Danzig). QTC-QSO may be arranged by foreigners with Germany as it is wanted. Each time as many QTC may be transmitted as there are. Overseas stations may also send QTC-Reports in connection with DX-QSO.

The QTC-Reports are to be transmitted in the following manner:

- (1) Call of the worked station.
- (2) Local time of the DX-QSO in four characters (0001-2400).
- (3) The received serial.

The German partner of the QTC-QSO only has to verify the correct reception of the reports, f.i. 5 QTC OK. Points may only be claimed after such acknowledgment. From the above you will see:

European amateurs can work with German QTC-QSO only. The QTC-Reports never can show D- or YM-calls. Example: ON4AU reports to D . . . W6CUH 0515/589012. This means ON4AU to have worked W6CUH at any day of the contest at 0515 his local time, where he received the serial number 589012. The serial means with its first three characters that W6CUH heard ON4AU rst 589, the latter three characters mean the 12th DX-QSO of W6CUH. At his side, W6CUH would be able to report this QSO in the following manner:

ON4AU 2115/579005, that means the QSO took place at 2115 W 6-local time. ON4AU heard W6CUH with rst 579, and it was the 5th DX-QSO of ON4AU.

Scoring: The scoring is by points. For each DX-QSO may be claimed:

4 points between Germany or Danzig and Overseas.

2 points each between Europe (except D, YM) and Overseas.

Each correctly acknowledged QTC Report counts two points.

The points of this scoring are summed up and, for European foreign amateurs multiplied with the number of the German districts worked on each frequency band. The German districts are indicated by the final letters of the call. There are 19 districts: final letters A, B, C, D, F, G, H, I, J, K, L, M, N, O, P, R, T, U, V. The 20th district is formed by YM4-Danzig. The different characters 3 or 4 are not regarded.

Hence it follows: A station outside Germany which did not work any German QSO is getting no points. European stations therefore are forced to send QTC to Germany for they can work QTC-QSO only with Germany.

In U.S.A., Canada and Australia (W, VE, VK) each district forms a country of its own. The same concerns G, Gl, GM, GW, etc.

Awards: There is no world-winner. The amateurs of each prefix zone are competing among themselves. The top-scorer of each country (district area) is awarded with a diploma. Two awards are given if there are five or more participants.

The amateur is the participant, not the station. If there is more than one operator each has to make a log of his own.

Log: There are no entrance formalities for the DJDC, just send the DASD your completed log. For the DX-QSO the log must show: Date, Time, Frequency Band, worked Station, serial number sent and received and the points claimed. For the QTC it is to show what German Stations received them and at what time the QTC-QSO started. The heading of the Log must show the name of the competitor, address, call and an abbreviated description of the station. At the end of the total score is to be calculated. Logs which reach the DASD after November 30th, 1939, can't be regarded. Each competitor is asked to send a log. If you do so you will get at least a nice verification card. Send all logs to:

Contest Manager DASD e.V. Berlin-Dahlem, Cecilienallee 4.

Pse mark stns outside the bands! Don't contact them!



# The Vee Beam Antenna

By B. R. Mann, VK3BM

Have you ever listened on 20 metres to a dying bard, when all but two or three outstanding DX signals fade out? Why do these favored few last maybe an hour longer than the rest? Were you able to contact them, you would find that it was neither high power nor good location that did the trick, but that each one was using an antenna of unusually low angle of radiation, probably a Vee or Rhombic. And to contact them you would need to use a vee or rhombic yourself! No other aerials, commonly used by hams, will produce such gain at such low angles of radiation.

**Which to Use.**—The vee is more suited to normal amateur work than the rhombic as it is easier to erect and adjust, and gives better coverage, its radiation pattern in the vertical plane being broader. The rhombic, when properly terminated and adjusted will give greater gain for point-to-point communications, but the design and adjustments are difficult, and when successful, permit only of communication over a limited area. A vee is better than an unterminated rhombic of comparable size.

**Dimensions.**—The vee must be long to be really worth while. Other more compact types of aerial can be constructed with performance as good as a vee of less than 4 wavelengths per leg, but a vee of 5 wavelengths or more will give outstanding performance. Eight waves long seems to be the optimum and is the size favoured commercially. Longer beams were found to be too directive, for instance a 10 wavelength beam tried here covered only half the U.S. A. with a good signal!

**Height and Tilt.**—The height is not critical, as with a rhombic. The support at the apex should be high enough to be well clear of all obstacles, and should be near the shack for efficient feed. Excellent results were obtained without masts as the open ends, just by pulling the wires tight and fastening

them with a length of rope to the fence! However some improvement was noted when the ends were raised to a half-wave high. There may even be improved gain as the ends are raised further, for two reasons:—

1. It is raised higher above objects in the field.
2. The angle of radiation is lowered by tilting and can quite easily be too low, thereby directing much of one's good R.F. into the ground!

For example consider a vee 8 waves long. The tables indicate that maximum power is radiated at a vertical angle of 14 degrees. If the wire is tilted 18 degrees, then the main lobe is projected into the earth at an angle of 4 degrees! To obtain maximum results therefore, the tilt should be adjusted so that the main lobe just clears the horizon.

If equal performance is desired from the front and back of the vee, the wires should be horizontal. There is a notable difference in the results from the front and back of a tilted beam.

**The enclosed angle.**—In the table you will see that the angle enclosed between the wires at the apex varies with the number of waves on the wires, therefore it should theoretically be different for each band. However, an antenna designed for 20 metres works very effectively on 10 and 40 metres and even exhibits considerable gain and directivity on 80 metres.

**Direction.**—The horizontal direction of the main lobes is along a line midway between the two legs. The directions of different capitals of the world are given in "Amateur Radio" for April, 1939, P.8.

**Cutting to Frequency.**—It is suggested that the antenna be designed for one's favourite frequency on the 20 metre band. It will be found to function on any frequency over a very wide range. The table gives the lengths at two frequencies in the 14 mc band. For further dope on the method of determining the

length, see the article by VK2GU in "Amateur Radio," August, 1937, pp 9-12.

**Feeding and Coupling.**—Tuned feeders are necessary if the antenna is to be used over a range of bands and frequencies. Anyone unused to long wire antenna will find the tuning strange as one tunes over the band. Feeders included, there may be 20 halfwaves on the wires. Tuning from the HF to the LF end of the 20 metre band would be equivalent to increasing the physical length of the system by over 17 feet! There may be some difficulty in achieving this by tuning, in which case small inductances or short lengths of feeder could be switched in, or a Collins coupler used.

The system can be made to draw well on any frequency in the most used ham bands, and will give excellent results throughout.

We cannot give much dope on antenna coupling in this article, but if your method complies with these requirements, it is efficient:—

- (a) Final draws normal plate current.
- (b) The tuning of final and feeders is sharp.
- (c) The coupling of the feeders to the final tank does not seriously react on the tuning of the latter.
- (d) The current is the same in each feeder.
- (e) The capacitances required for antenna system resonance are not abnormal.

**Constructional Dope.**—Number 14 guage hard drawn copper wire has been found O.K. for beams up to 700 feet long, but the usual tough glass insulators are **not** strong enough.

Half inch dia. woven cotton halyards were not strong enough, and were replaced by  $\frac{1}{4}$  inch flexible steel cables, without any losses being noted. Several V beams suspended from the same mast did not appear to effect each other's operation.

**Multi Way Vee Beam.**—Here is an idea that is being constructed for for trial at present. To get world coverage at great gain, why not place Vees radially right around a central mast? For instance, 10 wires each 558 ft. 6 ins. long, arranged around the mast like spokes of a wheel, with an angle of 36 degrees between each would surely be the ideal ham all-band, all-world antenna! The feeders could be arranged as a 10-wire cage, and adjacent wires would be used on 10, 20 and 40 metres, alternate wires on 80 metres, and diametrically opposite wires on 160 metres.

If radial wires of 6 or 5 wavelengths were used, respectively 9 or 8 wires would be needed, spaced 40 or 45 degrees apart.

**Receiving.**—If link coupling to tuner is used, and the link switched from transmitter to receiver, astounding gain is experienced. But more important is the directivity. Should you, for instance, decide to work Japan, at a suitable hour, you switch on the appropriate beam, and lo and behold, the band is full of J, KA, XU, PK, VK9, VK4, and possibly a couple of PY's, with all other sigs relegated to the distant background!

Perhaps it is unnecessary to add that this article is written mainly to interest those who, like the author, live in the open country, with limited power and almost unlimited space!

**VEE BEAM ANTENNA DESIGN TABLE.**

Number of Wavelengths per leg.	Included angle degrees.	Vertical Angel of Maximum Radiation	Length per leg at a frequency of	
			14050 KC ft.	14350 KC ft. in.
2	71	27	138 3	135 5
3	60	23	208 4	204 0
4	54	20	278 5	272 7
5	45	18	348 5	341 2
6	40	16	418 6	409 9
7	38	15	488 6	478 3
8	35	14	558 6	546 10

# Station Equipment

By VK5RE.

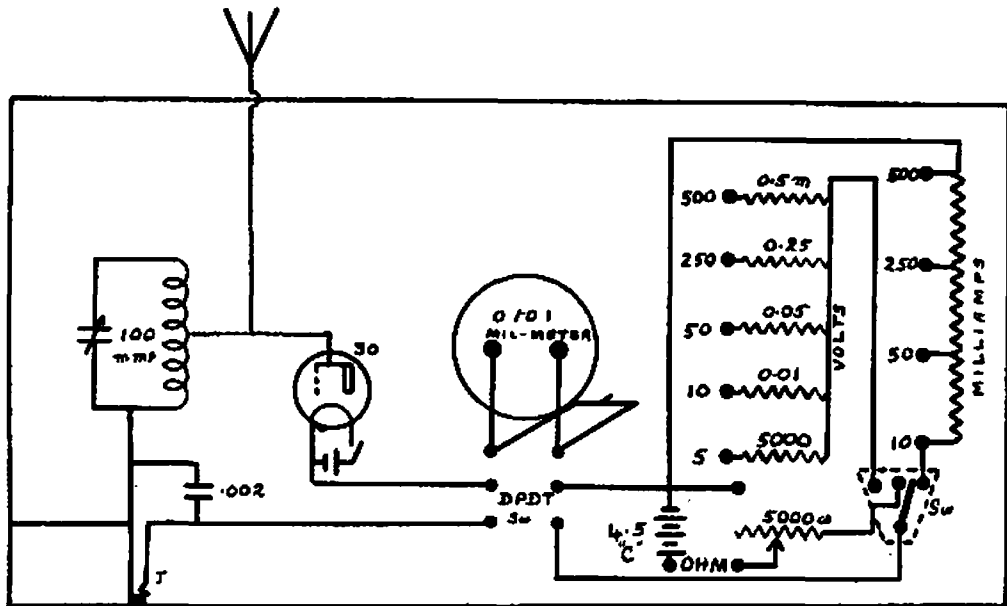
With Radio, as in every sphere of life, time, the irresistable, marches relentlessly ever onwards, and its many, many moons back to those days, when snarling arcs, and rotary gaps, belched their messages through space, to be deciphered by a finely adjusted cat whisker on a crystal!

Yet they are the stepping stones on which the march of progress placed her feet, stepping stones to the clean cut crystal signals of today — signals that cleave through

and a multi-Ohm-Volt-Mil-Meter.

After the income tax specialist had picked the bones white !! and after allocating (in a safe hide out) the beer money for the next twelve months, it was apparent that it was bordering on the edge of black magic, to think of even portion of the gear materializing.

However, inspiration came, and from that long distant valley in which the vast majority sleep — I could feel the swirl of the kilts, and



space, completely annihilating distances—

And as the march of progress has gone forward, in our transmitter design, so has our requirements for finer testing equipment advanced.

In the olden days, when the Arc gods ruled the ether, we were want to tune, and check, our transmitters, with a turn of fencing wire and a pea-lamp!

To-day, efficient stations demand efficient checking and testing gear.

Unfortunately, to-day—as in the past—instruments cost money, and equally unfortunately, the procuring of that self same money, is no less difficult to-day, than yesterday.

Here it was agreed that for 1939 operating, the following gear was an absolute necessity, i.e., A field strength meter, over modulator indicator, a check on the key clicks,

faintly hear the skirl of the bagpipes, as my ancestors played a fanfare to my idea that all those meters should be housed in the one container—using the one meter.

The mil-meter on the shelf here had the scale markings 0 to 1. However, a Sydney firm supplies a multi scale dial for three pence, so one was procured and fitted to the meter.

A shunt was wound for the 10, 50, 250, 500 mil readings, and the necessary resistors hunted out of the junk box for the various voltage readings.

Nothing original is claimed in the circuits used, they are definitely "a la Handbook", a type 30 tube does the trick in the field meter portion, and a double throw, double pole switch, of the Toggle variety, switches the meter in or out of the two circuits.

Continued on page 28

# Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceding publication.

## N.S.W. DIVISION

President: H. PETERSON, VK2HP.

Secretary: C. HORNE, VK2AIK.

Magazine Manager—J. H. FRASER, VK2AFJ.

You all will have noted that the magazine appears somewhat different this month. Yes, our Melbourne friends have re-organised the magazine, and here it is, but as Abraham Lincoln once said, "You ain't seen nothing yet. Amateur Radio is going to be improved and enlarged as time goes on.

However, the quickest way to improve the magazine is (1) to support the advertisers (2) send in technical articles for publication (this applies to you technical men in particular) and (3) to try and get new subscribers. If you know of any chap in your town who is interested in experimental radio, then get him to send in a sub for the magazine. It is only 6/- per annum post free. I will see to it that he gets the magazine promptly each month.

Now a few words about these notes. I have decided to publish notes from the Affiliated Clubs who sell "Amateur Radio" at their meetings. The space allotted will be strictly in proportion to the number of copies sold each month. You will see that notes from three clubs are included this month. Please let me have the notes by the 12th of the month.

About the country districts. The zones are being mapped out again and district registrars appointed. So far we have two men appointed, 2IG at Albury and 2KZ at Kurri Kurri. Notes will be published as soon as received from these district registrars, so if you live in their districts send on any information to them, otherwise send in a station report to me and I will publish it. Something along the lines of that sent in by 2VU in July issue will do me, but let me know something out of the ordinary if you have it. These last few remarks apply equally well to any city hams.

I am endeavouring to make the N.S.W. notes as interesting as possible to everybody. They are your notes so tell me your activities and I will publish them.

Here's wishing the Committee all the best with the new Magazine, and don't forget to help them yourselves, you fellows, please.

An outstanding DX contact was that of Reg Flood, 2BN, who worked VE50T on 80 metres at 10.30 p.m. late in June. The reports were RS 57 both ways. 2VN reports favourable conditions on 40 metres lately, and a rare one was a HK at 6.30 p.m. early in July.

About the all band CW contest this year. How about you country chaps joining in and seeing if VK2 can't win it this year. It will be an excellent chance of trying out all the bands, and finding just who is on these bands, so that if an emergency arose in your district, then you would know who you would be able to contact. The 160 metre contest will be another chance of testing the effectiveness of your communications. VK5JT is very keen on this emergency network. Anyone interested should get in touch with him. He is on daily on 40 metres at 8 a.m. Best of luck you chaps. 73 till next time.—2AFJ.

## UHF SECTION.

The second meeting of the recently formed ultra-high frequency section of this division was held at Y.M.C.A. Rooms on July 6. The president, D. B. Knock (2NO), took the chair, there being present 19 members and 2 visitors—2WJ and Mr. Phillips, a prospective ultra short wave listener.

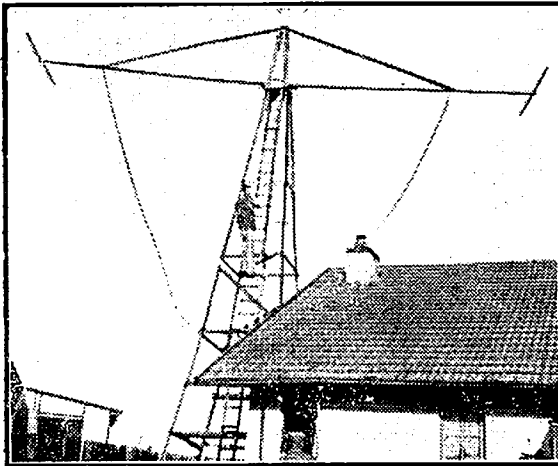
It was decided at this meeting that the roster of station schedules for transmission in the 56 mc band should remain as previously, with the difference that the procedure be modified as required individually. Instead of maintaining an unbroken hour's transmission, stations will seek contacts at fifteen minute intervals. As the object primarily of the schedules was to insure that at least one station should be active on the 56 mc band each night, there is no necessity to stick rigorously to the hourly transmission if and when other stations are on the air for general communication.

More activity is desirable during daylight hours at week-ends, when DX conditions are most likely to be favourable. In addition there may happen to be listeners at distant stations. However, it is worth while noting that there will always be a Sydney station on the air at night time, and thus a newcomer would be able to find the band.

A decision was reached regarding the "Australian Radio News" Cup. It has been donated by "The Bulletin" for outright win in U.H.F. Activities. This cup will go to the member of this Division of the W.I.A. who shows evidence of the most valuable and consistent experimental work on the 56 mc band during the period August 1, 1939, to July 31, 1940. The decision of the Council for this award will be final and binding.

All interested should listen for VK2WI on 7200 KC the Sunday before the first Thursday in each month for news of the U.H.F. Section. Attempts will be made to

relay these broadcasts on 56 mc. It has also been suggested that more use be made of the 7 mc. band for the purpose of arranging and checking up on 56 mc. schedules. For information on schedules the following telephone numbers may be useful: 2IQ-2AFQ: UJ 4465; 2NO: FW 2443; 2WJ: FJ 1222;



THE ROTARY BEAM AT VK2AJF  
VK2BZ on the ladder.

2VN: XM 1928; 2AFM: UW 8917; 2HP:  
FX 5768; 2TI-2WI: FX 3305; 2EM: JX 3438.

It had not been possible to arrange for a visiting lecturer for this meeting, but

Mr. E. Fanker (2HS) will lecture at the August meeting and Mr. R. Treharne (2IQ), will be the lecturer on September 7th. The title of his lecture will be, "Some Interesting Phases of U.H.F. Work."

It is hoped to give notes from Mr. Fanker's lecture in the September issue. The epidiascope which Mr. Ron Rutherford is making for the Institute was given its initial try out at this meeting, and will be installed by the next meeting. It will be used at all meetings of the Institute and the lectures will be very interesting.

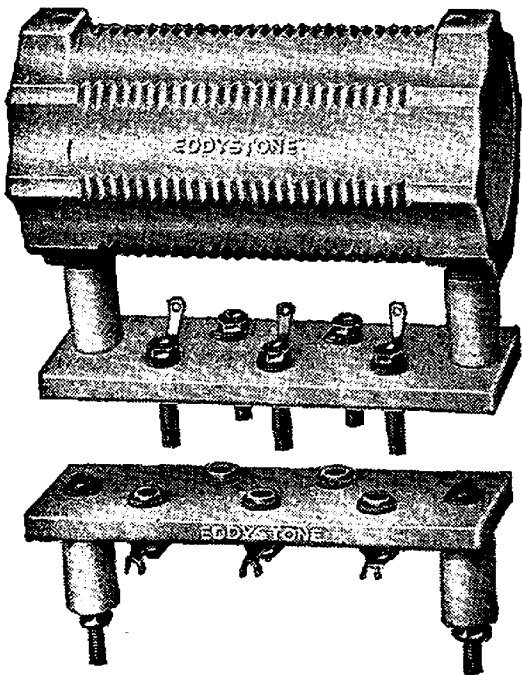
#### WAVERLY RADIO CLUB.

As no notes from the above club have appeared for some time I will give you a summary of the happenings since February.

The Club's dinner was held on the 28th February and was, as usual, a huge success. It was the 20th anniversary and already plans are in hand to make the 21st dinner the biggest on record.

Two field days have been held. The first on the five metre band was held in the vicinity of Avalon and the second at National Park on Sunday, 4th June. The last one was particularly successful. A transmitter signing 2BV was powered by a 1000 volt generator driven by friction from the back wheel of a car. Stations contacted during the day were 2ALX Orange, 2AKI Taree, 2BJ Chatswood, a report of Q4, R5 being received from Taree. On the 20th June the members were treated to a

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A fully illustrated catalogue of the Eddystone range is available free from Eddystone Distributors, or from the factory representatives.

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very interesting lecture by M. Lusby B.Sc., 2WN. He selected for his subject "The application of waves in the ultra-high-frequency spectrum."

On the 27th June, George Paterson, 2AHJ, obliged with what one of the old-timers described as "the finest elementary lecture he had ever heard. Perfectly understandable, it was a pleasure to listen to.

Ask 2AFZ and 2TN about their famous DX effort, but don't tell them I told you.

2FJ and 2AFZ are rebuilding. They must be going in for "racks" in a big way, 'cause one Sydney firm has reported a shortage of ready cut chassis since they started.

Last Thursday, members and their friends tempted fate at ice-skating. Reports to hand seem to point out that more than xmitters were "on the ice."

### MANLY RADIO CLUB.

2MR.

2AMQ ("Little Jim") considers himself the DX king around Manly. 2AMS is getting a new rotary beam going as well as being very active on 40 mx. 2AFN is also building a beam in the hope of more QSOs and QSL's. 2ALB (Charlie) is chasing dope on supers. 2NG playing with 6L6s on 10 mx. Gordon (2ACJ) has an electrolytic condenser that blows smoke rings. Admission is 6d. but don't rush. Keep in the queue please.

### LAKEMBA RADIO CLUB.

2LR.

The second field test held by the above club in conjunction with the Bushwalkers' Federation Search and Rescue Section, was held at Glenbrook on the last Sunday in June. Two of the party were unfortunate enough to be held up with car trouble. 2EH broke an axle near Penrith but succeeded in communicating with the base station at Glenbrook and arranged to be picked up later in the day. 2VA's party burnt out a generator shortly after starting out, and had to hire another car.

The two inland stations operated by 2ACS and 8HB had no difficulty in maintaining constant communication with the base station operated by 2VA. The city station was 2ACE, with whom 2EH had no difficulty in communicating from the banks of the Nepean River at Penrith, and advised him of his plight.

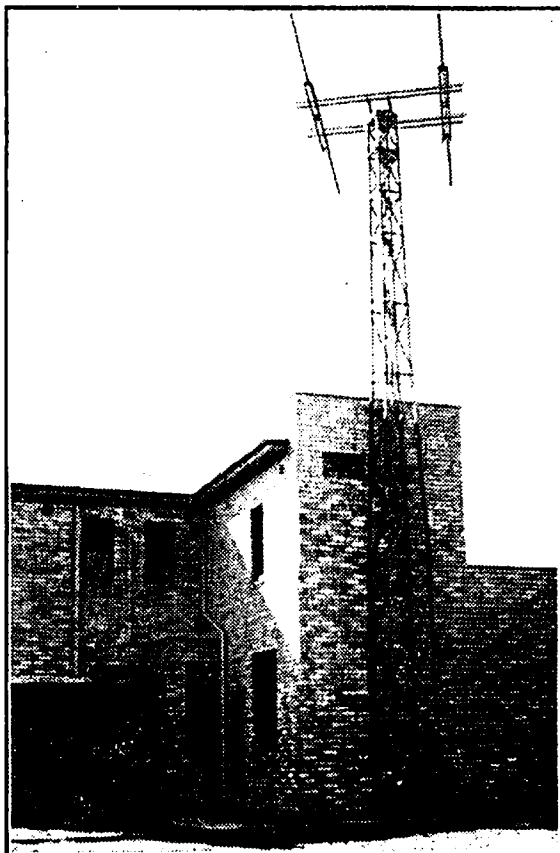
The apparatus used on this occasion was all low powered. The inland stations were operated by one or two 60 volt dry batteries for plate supply, while the base station only used about 5 watts. The day was a huge success and demonstrated once again to the Bushwalkers' Club that radio would be of considerable advantage to the parties, when occasion necessitates the searching for persons lost in the bush.

### COALFIELDS' NOTES.

2KZ Registrar.

2YO has completed the "2JU" super and it certainly looks very nice. 2XT has at last obtained a shack which is a one room affair, so as soon as the antenna is up he should be on the air, after having been QRT for some time. 2KZ doing very little on the bands. Building the "2JU" modulator with a few ideas added, hoping to be on fone next month, but still likes the old key. 2DG is building a new rig using 42, 807, 808, and is on fone on 20 at the moment, but like 2KZ, likes CW very much. 2YL as regular as the sun on 20 mx, and has

just completed a new rig. 2XQ has an idea about rebuilding. Has a very nice shack. John says visitors welcome any time at the shack. Will be getting married shortly. Good luck OM. 2PZ has designs on a new multi-band oscillator, and is also contemplating building a new frequency meter monitor. Guess this rebuilding craze has bitten the boys up this way. Silence from



VK2KB's NEW ROTARY AT NEWCASTLE.

these boys: 2KE, 2CW, 2MK, 2EP, 2KQ, 2CX, 2ACG. I would like to hear from you chaps some suggestions for a Northern Convention in Newcastle to be held during August or September. Don't forget to send along notes to me, boys, please. 73 MAX.

### KEEP THESE DATES FREE.

17th August—General Meeting.

7th September. — U.H.F. Meeting, Mr. Ross Treharne on "Some Interesting Phases of U.H.F. Work."

21st September. — General Meeting.

Time—8 p.m. Place—Y.M.C.A. Rooms—325 Pitt Street

All members of the W.I.A. will be distressed to hear of the bereavement suffered by Mr. H. W. S. Caldecott through the death of his mother. Our sincere condolences are extended to him and his wife in their loss.

### VICTORIAN DIVISION KEY SECTION NOTES

(By VK3CX)

There must have been considerable confusion in the minds of the hams at the last K.P.S. meeting when they permitted 3OC to resign from the position of correspondent and elected the ex Lawd Mare of Gulchview to that exalted position. Having been his greatest admirer, no one knows better than I, how hard it is going to be

to produce something which will approach anywhere near the quality of the epistles penned by that worthy scribe 30C.

As it is rumoured that OC is going on fone, we now know why he did resign and speaking of fone let me tell you of the experience of JO who had occasion to cure some of his fone QRM in a BCL set. At the end of his experiment and when the BC set was again going as it should with one of Herb's chokes in it, the owner wanted to pay JO for his excellent service. That's a tip for all to go on fone and make some pocket money.

The boys on 14Mc are at last getting some revenge on the commercial stations which have been invading our band. How? Easily, they have installed E.C.O. You should hear them between 14400 and 14450 kc. Stumbled across our old friend WX the other night making noises on 14Mc where he was holding a mike party with a ham who rejoices in the call of 3 Queer Vices. I'm sure the shortwave listeners gained a good impression of ham radio from listening to the QSO.

The most important task of the last K.P. meeting was the election of a new Chairman and Secretary. After a very keen contest our good friend QW was elected Chairman, who, besides filling the chair most graciously, has at last killed all the bugs in his super and now threatens to work everything in sight on 7 Mc. The position of Secretary is now most capably filled by UM who, besides spending a lot of time with his dentist, has built himself a new exciter which will make noises on 14mc. The lads still manage to evince considerable interest in antennas and perhaps the most notable is that of IG who has a 3 element beam atop a 90 foot tower. Think he must be reaching for the stars when we consider that RX has to content himself with less than a 20 foot pole to hang his rotary on. Another reason he is off the air is a brunette.

DM expects to do big things with an 809—his other hobby of stamp collecting is also shared by CX. Having used up all his good tubes DP is now reduced to using his previous throw-outs. Answering RJ's query as to c.w. men on 10 metres—yes, there's plenty there but they get misguided ideas and use fone. RC says he is going to be active on 10 but whether c.w. or not remains to be seen. ML treated the gang to an oration on Council's doings, magazine,

and other things and also handed out specially printed Lists of Countries for those who are dx minded. Same can be had on application to ML if you don't mind a lil advertising on the other side. ML took JO and CX three-quarters of the way home in his car, then said "NO," and JO and CX had to walk the rest.

There must be something in this business of getting new receivers, I think I'll have to get me one too as on enquiry at the meeting FR confesses to a new 5 tube TRF which out performs any super he says, MV has a new super with outperforms a 5TRF, VF is building a new super with all the trimmings, whatever that means. QV says the same, but besides the new receiver he also alleges a new transmitter and antenna. Using the usual language too when the screwdriver screws into the hand instead of the screw. SQ is having lotsa fun building a new rig while UK confesses to burning the wick at both ends—guess he is trying to make them meet. SG (now nicknamed Sleepy Gent), knows all about the 7200-7300 fone band—just ask him. VF is rejoicing in a QSL from someone who signed himself B2AB—he sounds as good as some of the others heard recently such as B4UP, T4TWO and POPI. CX ran into a foul call sign when he worked V14A/V14W who professed to be VS5AD on a freighter.

Charity begins at home and this month's gold plated pea-lamp is handed with full municipal honours to OC who sent in the solution to what a "Handle" really is—and it's not a Name as many thought. In closing I would implore you, if you don't like these notes, DON'T tell me about it, I've got enough troubles. Tell someone else and he might be induced to read this column too and in that way I'll convince the editor that I am building up the circulation, and finally don't forget to watch your local theatre for "Grand Jury Secrets," a real ham picture.—73.

### UHF SECTION.

By 3JO.

Section meeting night—Tuesday, Aug. 15th.

Office-Bearers elected at July Meeting:

Chairman—Mr. STEVENS, 3JO;

Secretary: Mr. SEWELL, 3IK.

Technical Advisers — Messrs. MORGAN, 3DH and STEVENS.

Our readers' attention is directed to the N.S.W. notes in the July issue wherein are

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details of the reformed UHF section in that State, and schedules of transmissions by its members. The division is to be congratulated for its enterprise and foresight in reforming the section and arranging such a roster of stations to keep regular transmissions on 56mc, and it is to be hoped that this idea will be adopted by other States.

#### 56MC in Port Philip Bay.

On Sunday, August 20th a portable 56mc station will be located on a boat in the bay. All 56mc hams are requested to keep a good lookout for these signals and VK3EA, the owner of the boat, has generously offered its use for the occasion.

### VK3 FIVE METRE CONTEST

Sunday, August 27, 1939.

Object: The objects of the contest are twofold, namely—

- (a) To interest hams listening but as yet not operating on the five metre band in the idea of starting to transmit there.
- (b) To provide all entering with a chance to show what they can do under conditions which will avoid the farcical result of the last contest held on this band, wherein the number of logs submitted was about two.

Logs: All logs are to be on the forms which will be available from Herb. Stevens, VK3JO, and on completion, are to be posted to D. Randall Ayre, VK3KP, Equity Chambers, 472 Bourke Street, Melbourne, C.I., to reach him not later than noon on the Wednesday immediately following the Contest.

Prize: The winner will be awarded a modern tube of a type suited to ham work, the type being as yet undecided.

Time: 0900 to 1400 hours, Sunday 27th, August 1939.

- Rules: (a) Less than seven logs submitted will render the contest null and void. No QSO valid unless log is submitted from both ends.
- (b) No limitations on power, frequency or type of transmission, other than it must occur on the five metre band and comply with P.M.G. regulations.
  - (c) Winner must have more QSOs than the average number for the contest but not necessarily the greatest number, and must have the shortest average time per QSO.
  - (d) In addition to the usual strength and readability reports, contestants must originate in each QSO a message of not less than 15 words giving a good reason why the five metre band should be more popular. This message to be copied at the receiving station and entered in the log for that QSO. A different message must be originated by each station for each QSO. The messages will also be logged by the transmitting station in order that the accuracy of the transfer can be checked. Points will be deducted for inaccuracy in this connection.

- (e) The duration of a QSO is to be measured from the commencement of the first call to the conclusion of the last signature, thus:—

1130: B de A

1131: A de B:—Report.

1132: B de A:—report and message.

1139: A de B:—message and sign.

1146: B de A:—sign.

1147: End of signature.

Time of QSO equals 47 minus 30, i.e., 17 min.

- (f) A given station may be worked a second time, providing that at least three contacts intervene between the second and first, and different messages are exchanged the second time. However, for the purpose of averaging the number of contacts, second QSOs will count as half a contact.
- (g) The W.I.A. contest managers (UHF Section) decision as to the winner to be final. The U.H.F. Sections contest manager is 3KP.

### EASTERN ZONE NOTES.

By 3 DG-VG.

3DI—Jim active on 40 mx during day-time when not busy servicing.

3GO-3LY.—Busy still at 3TR and will be for some time. Made visit to Stratford last week-end

3HT—Dud has made an appearance on 80 mx, cw. of course and is working the ZL's hand over fist.

3HK—Keith putting out a fb signal on 80 mx and puts the boys right after examining their sigs on oscillograph.

3EA—Evan has not been heard or seen for months. The fish must be biting exceptionally well.

3IC—Ken has blown his 89 xtal osc., don't be downhearted boy

3WE—Bill busy working contest as scribe writes these notes and seems to be hitting up a score.

VK3IL—Still missing, his whereabouts unknown by notes correspondents.

3XH—Stan having trouble to get out with his (?) watts.

3VG—Howard trying twenty metres, but thinks he will have to put up another antenna to get out decently.

3PR—Ron having trouble in getting Heising mod. to function as it should, also trying out new vibrator units.

3XZ-3HZ—Reported to be rebuilding, so will hear from them later.

3IG—George still adding a few new countries to his already good score of 66.

3PG—Albert what about coming up to 80 mx, like your deaf pal Dud? It is worth while, take it from us.

3SS.—Keith still spilling a few surprises on the boys. Has gone QRO and doing fb work with 4/5ths of a watt to a 807 believe it or not.

3QB—Jack has not been reported for quite a time. What's the trouble Jack old chap?

3DG—Putting up another Vee Beam for W. using 4 wavelengths in each leg.



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3-5 Riversdale Road, Camberwell	- - - - -	WF 1188
97-99 Puckle Street, Moonee Ponds	- - - - -	FU7822

## WESTERN ZONE

VK3HG.

3XC—After much trouble and crystal shattering, is on 3.5 mc. for weekly sked and will be regular from now on.

3RA—Apologies to you OM for the writer's error last month in putting your call as 3DA.

3II—Batteries getting very sick and not on much. Will soon have the AC available. Half your luck OM.

3SZ—On again after a period of inactivity due to defective tube in rig.

3TW—Had night out when Redhead dance band of 18 YL's visited the town. On phone again after periodical rebuild.

3CK—Has very little luck on 3.5 mc. with low power CW so works 7 mc. mostly. Is interested in 14 mc. also.

3WT—Not heard lately. Must be changing his address like 3KX.

3JA—Still raising a new country or two on 14 mc., and has hopes for a new receiver soon.

3GA—Reported to be on but has not been heard here.

3XW—Working a few on 14 mc. phone when conditions permit. Still experimenting with and adding tubes to the new receiver.

3HG—With aid of 3II and second op. successfully raised big new stick. Official height, 125 feet six inches. New antennas will be three 12 wavelength V beams.

## NORTHERN ZONE NOTES.

By VK3BM.

3EC.—He started on his Rx and the new job is excellent.

3TL.—Has built a new receiver.

3CE.—Roy has improved his modulator. Quality is quite nice now.

3KY.—Has moved from Kyabram to Woodend.

3EF.—Bert intends to try 160 mx. Is doing well in VK-ZL 'phone contest.

3HR.—Charlie is reported to have obtained a Chapman 2-stroke engine to drive his alternator.

3QZ.—"Snow" reported Graham's CW note, the best heard on any band. Congrats, OM.

2AHY.—Eric has finalised at Lock 5, and will probably move to Broken Hill.

3PY has branched out in a new business venture in Warracknabeal.

3SE, of Ballarat, is looking for contacts on 160 MX.

3ZK.—Jim has built an fb new super het., improved his modulator, and rebuilt his transmitter.

3KM.—Mac and XYL Doris put out a nice sig. an 80 mx fone from Corryong.

3IJ.—Ian has just broken into 'phone operation from Marong, near Bendigo. Your sig. is fb. up here, Om.

3NN.—Herb has been heard only thrice since the junior op. arrived.

3OR.—Is erecting an 8JK beam for U.S.A., and has installed an 807 in final with fb results.

3HX.—Tom was heard once for the month. Is very busy.

3JG.—Johnny found after "Snow" had been and gone that a major rebuild was necessary!

Believe it or not, 3BM has taken to CW! But only during repairs to the convertor.

## QUEENSLAND DIVISION

The July meeting showed quite a large roll up of members as well as a few visitors. Mr. Vince Jeffs, 4VJ delivered a lecture on antennas, this subject being Vince's speciality. The present council seems to have succeeded in stimulating activity in the Queensland Division, which is certainly gratifying. A field day is to be held in August and as 5 mx will be the band chiefly used, it may revive interest in this band, which has not had much use in VK4 of late. It may be as well to mention here that Mr. F. Beech, 4FB has donated a cup for the most outstanding portable station of the year. Interested hams should communicate with the secretary. 4JP has also offered a tube to the ham who brings in the most new members. So go to it boys!

## PERSONAL PARS.

4CJ.—Cedric spends his spare time chewing the rag with the boys on 40 mx.

4AP.—Heard working the Yanks on 10 mx occasionally of a Sunday morning.

4RY.—Bill now has 99 countries—

4AW.—Down and nearly out with 'flu. You're not the only one, Arthur.

4KH.—On 20 mx trying out various microphones—don't like the reiss, particularly Bill. (Why not 5 metres?—Ed.)

4KA.—In Gordon Vale making short work of that elusive dx. Believe it's your antenna OM.

4PX.—Arthur putting out nice fone with an 80I in P.A. and 6L6G's as modulators.

4KS.—Working DX fone on 20 mx. Say Keith, the W.I.A. meetings are held on the first Friday in the month.

4JB.—Oscar putting out a very nice sig, which sure does go places.

4EL.—Works those Europeans like nobody's business. What's the secret?

4SA.—Alan finds fone handy to relieve the monotony when dx. just doesn't come through.

4FJ and 4EL and others troubled by key clicks from 4LT, and we believe that 4FB isn't entirely free either. Key click filters are easy to make so how about it Albert and Fred?

4FL.—Building new shack with lounge chairs, hot water system, and other comforts—wot next, Frank?

The fone business under 4FJ seems to be getting into nice running order. Roy keeps skeds with 4EI and 4TY at 6.45 a.m. and 7 a.m. respectively. 4XN in Dalby is also getting ready. You country men should keep a lookout for 4FJ on Tuesday and Saturday mornings on 40 mc. Please communicate with the W.I.A. in VIB if you wish to arrange skeds, in the event of not being able to contact the VIB station. 4GZ keeps bi-weekly skeds with 4FJ, and passes along any dope.

### BUNDABERG ZONE NOTES.

4XR.—Eric wants to buy a car—going to give his motor bike to 4XO. Might just as well as the only things 4XO doesn't do with it is to pay for the petrol and registration.

4XO.—Mark fairly quiet lately, so anything is likely to happen in the near future—4XR please note, he's generally the victim.

4UX.—Claude popped into town over "Show" and stayed with 4XO for a few days. Likes Bundy so much that he got a job and is now one of the boys of the "Cane City."

4JJ.—Busy fixing BCL sets and selling lighting plants.

4HP.—Please note that you should always switch on the rig when you want to work the dx—keying without the rig on "isn't done."

### SOUTH AUSTRALIAN DIVISION.

(VK5JT).

A meeting of the Council was held on July 5th when a further batch of applications for membership were dealt with. Members should note that "Amateur Radio" is now posted direct from the publishers to those who are financial only, so if you want your copy be sure and send in your subs. I suppose most of you read the article in "QST," which stated that the ARRL and the French Radio Society were lodging a vigorous protest against the French station that had started broadcasting on the 7 mc. band. This has had the desired effect as the station has closed down. Here you have an instance of what can be done by a strongly organised body. If the licensed experimenters want their interests protected they should join the W.I.A. and so have a strong society to stick up for their rights.

A test was held on 160 metre band on Sunday, July 9 to ascertain the distance over which signals could be reliably received during daylight. Whether it was due to skip or lack of interest on the country chaps' part, the only signals heard were VK5FM, VK5RN, and VK5JT. Les Catford, VK5LC, reported that he had heard the signals at Gladstone, 150 miles away. I would like to see all the country hams on in the 160 metre and the All Band CW Fisk Contests during September.

Usually, there are only two or three on and so it is not very interesting. VK5FM (Pete Bowman), is still running the broadcast session for the benefit of country members at 9 a.m. on 7 mc. If you have any suggestions or ideas put them through him as he is your rep. on the Council.

Overcrowding of bands.—Some of the bands seem overcrowded, especially with fone. The following suggestions to split

them us should help. For local contacts, fone and CW, use 5 and 160 metres. For State contacts, fone and CW, use 160 and 80 metres. Interstate, fone 80 and for CW 80 and 40 metres (fone only to be used on 40 metre band between 10 p.m. and 8 a.m.), except during emergency working). For DX (outside Australia), 10 and 20 metres. Now give these ideas a try out chaps and clear up some of the racket on 20 and 40 metres. I notice the country chaps lately seem to concentrate solely on fone, what's gone wrong with your keys or is it your receiver has no BFO?

AUSTRALIAN-WIDE EMERGENCY NETWORK.—A motion was carried at last Convention to organise this. Nothing has been heard of it so far. In Adelaide we have organised a City Network and have the names, addresses, place where working, fone numbers (work and home), gear, hours available, means of transport, of the city chaps who are willing to act. To swing it into operation all that is required is a telephone ring from the G.P.O. or the National Safety Council to the Control Officer (VK5JT). Now what about the other State Divisions doing the same in each capital city. Then daily skeds could be maintained. To get the ball rolling skeds are already being held daily on 7 mc. between VK2AFJ and VK5JT at 7.45 a.m. EST. So join in VK4-3-7 and 6. If you don't hear all the States you can always QSP. Country Hams interested could make skeds amongst themselves and the city Control officers, the idea being to form lines of communication throughout the whole of Australia with daily skeds, morning, noon or night, on any band. Traffic could be originated and routed around Australia to see what we could do and how quickly we could get in touch with any particular town. This, besides being interesting in itself, would be appreciated by the Authorities in times of emergency, especially breakdown of telegraph lines, etc.

The Postal Department having already intimated that they would be glad to use us in times of breakdowns, but stated that all communications must be in MORSE (CW). Actually we are not in a position to help them if they require us, so what about it Hams? The Yanks have had emergency networks going for years, and have done some very useful work. Country Hams write to your Divisional Councils offering to fill the breach at your town, and send in full particulars. The procedure for postal breakdowns is that as soon as the lines go dead the G.P.O. rings the Control officer, and at the other end the Postmaster gets hold of the local ham, they both go on the air immediately, and contact and push the traffic through. Well this is enough for one session, but I hope all the licensed experimenters will join the W.I.A. immediately, and also enter into the emergency and traffic handling idea with enthusiasm.—73.

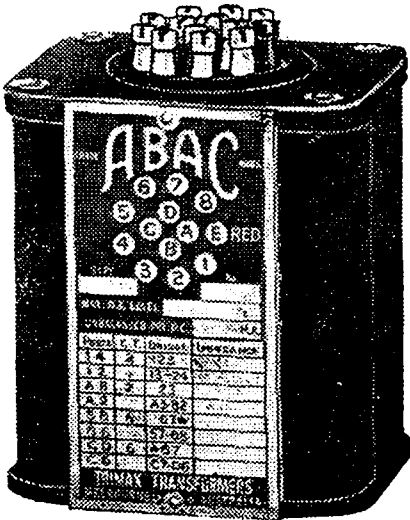
### WESTERN AUSTRALIAN DIVISION.

Division meets on Second Tuesday each month, at 8 p.m.

July general meeting saw a good attendance and a good trek towards the Treasurer with annual subs.

Announcement of officers for the coming year was made, and once again 6MW (W. Weston) is divisional president, with 6GM

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and 6BB vice-presidents, 6CX Secretary, 6KS Treasurer. A new departure for VK6—the formation of a U.H.F. section—was discussed, and a committee comprising 6BB, 6FR, 6GB, 6KW and 6LH elected. On the motion of 6AF it was decided to entrust to the T.D.S. committee the task of drawing up rules and scoring systems for the various annual competitions, sponsored by the division, to remove any vagueness that may exist as to what is expected of competitors.

A very good suggestion came from 6LH, who spoke on the necessity for a "host" at meetings, to look after newcomers and visitors, and see they are introduced to the members. A motion to this effect was carried, and two members chosen to act as "Host" and "Deputy Host" respectively. Wisecracks, freely indulged in, about the need for fancy costume to distinguish these gentlemen, finally resolved into a serious suggestion (adopted) that they wear small ribbons in their lapels, with their "titles" thereon.

The meeting closed, and a suggestion period opened which lasted until 11 p.m., the time seeming to fly past as member after member got up and spoke his piece. Some very interesting points of view were brought to light, and if only a few of the suggestions are acted upon, the coming year should be a good one.

Undamped waves.—

6KB now off sick list and attended July meeting.

6KO heard lately testing fone.

6WS very pleased about his "S.W. and T." trophy for station photo and write-up.

6RU—the "postman's pal"—gets so many QSL's, the mailman complains. Don't forget his Xmas-box, Jim!

6ZX has a snappy band-switcho xmitter, and flits about from band to band, working what's to be worked, and occasionally coming up to the surface (7 mc. to you) to say "hullo" to the boys.

6IG planning final stage for new TZ40, and hopes to modulate with 6L6gs. When do we hear that velocity mike, Ian?

6HT, 6FL, 6RW, 6AZ, 6AH, 6AW, 6GL, 6LM and 6RL are the most active country stations these days.

Flash! Volunteer fire-brigades, police, and several divisions of infantry rushed to Maylands recently to investigate strange phenomenon noted. Those brave enough to approach close to the scene tell of a certain VK6 found in his shack coaxing large volumes of acrid smoke from a "heavy blunt instrument." Gas-mask production will be speeded up in the stricken area.

Those who attended the Annual Dinner (June 17) had a jolly good time, and the only regret was that more country members were not able to attend. Trophies were presented to their winners—6MW ("West Australian" cup for third time and "keeps"), 6KW (Senior R.I.'s trophy), 6MW and 6Giv (tie for Hayman trophy), 6GM (Carl Cohen trophy), 6GM (President's cup), 6GM (D.F. Field Day cup), 6AF (7 mc. Field Day cup), 6AF (6BB "809" trophy), 6IG (56 mc. Field Day cup), and 6WZ (6AB cup). A new "West Australian" cup was offered for the coming year by West Australian Newspapers Ltd., an RCA Velocity mike by Nicholsons Ltd.,

Continued on Page 28

## HAMADS

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### STRAY.

Did you hear the gem of Mr. J. Malone's reminiscences as told at his last official farwell dinner? It is about the woman who said that in regard to the payment of her wireless licence fee it had always been her practice to pay for it out of her maternity bonus—and would Mr. Malone mind allowing her an extension of six weeks for that year. Apparently it takes more than thermionic emission to keep a radio these days!

### AN ACTIVE HAM IN DARWIN.

VK5JT advises that there is now an active ham in the Northern Capital. VK5AB is the call, and he is on 14 mc. Give him a call, chaps.

and a handsome globe by C. H. Park, Esq., who also donated £10 to the division to provide trophies for competition by those so far unsuccessful in annual contests. It seems we're all set for a 100 per cent. year!

—73, VK6WZ.

## NEW GUINEA NOTES

By VK9VG.

Condx this month have been about the same as last, with all the Ws. in the States coming through, and a few South Americans on rare occasions, but very little else. In the early morning a few Europeans get through, but so far none have been worked from here, although the chaps down South seem to have no trouble. As far as I can see, contacts with VK are off for the usual 'winter season' in the tropics, as I can't get through at all now. See you about Sept. VK's.

9XX—Came to light again with a rip and a shout of "CQ DX". Try and get on to 7 mc. and meet the gang again.

9DM—Had a nice letter from Dudley this month, telling me all about himself and doings. Got through to W4 ok with 10 watts es has great hopes of good dx with later models.

9DK—Ernie is not doing so much these days, due to a spot of bother with the house lighting plants.

9WL—Very busy lately with N.G.A.R.L. affairs, but still finds time to get on the air.

9BW—Bill has broken out in a fresh place with a fone rig, and it seems o.k.

9RM—Also worked VP5 on cw. The QSL argument has been forgotten since the arrival of a W mail es last time I was down to see Peter he tried to trap me into a fone v cw. argument but nd.

9GW—Had a visit from George the other day and had a good chat. Has hopes of getting on the air soon again.

9MC.—Shifting his QTH again, but still able to get on the air on 7 mc. for a chat now and then. Get down to 20 and do some dx with the troops.

9RC—We don't hear much of Ron, except on 7 mc. rag-chews, but still have hopes of getting him into dx one of these days.

9AD—We welcome you Breck oc to the fold, and long life to the new rig.

9HB—The parts for the rig are on the way, and Harley has hopes of getting on in time to have some dx ready for next month. The rig is to be a three stage 6v6-6L6-807 around 40 watts input.

9NB—At present busv building lattice tower to carry 3 element beam. All suggestions re rotary beams gladly invited.

9VG—Just tagging along, sometimes on fone, sometimes on CW. Had to be in on this VP5 business es it took nearly an hr (till he had worked nearly all districts in VK) before he came back. Still trying to get Sth. Africa for Fone WAC.

When the head phones, are plugged into the phone jack, the presence of key clicks, excessive carrier hum, or quality of voice modulation can be determined, inserting a 10,000 ohm resistor into the phone jack the milliammeter will indicate over modulation peaks, as shown by a fluctuation of the steady carrier.

Neutralizing can also be carried out by this unit.

Of the multi-meter portion, little need be said, other than that it will do most everything, except pay the licence fee !!!

The complete unit is compact, and is housed in a container 7 inches x 10 inches x 6 inches, and once again from that vast valhalla, a muffled cheer, in Yiddish and Gaelic, drifted down thro' space, as my ancestors, accepted my decision with acclamation to use a Griffith Bros. tea tin as the container.

This tin, strengthened slightly, with scrap aluminium, and fitted with a new lid, home made from aluminium, forms an ideal container for this unit.

Altogether the complete unit is compact, neat, readily portable and, most important to every 'ham,' be he city, or country located, the cost is very, very low—in fact everything here was found in the junk box, excluding, of course, the millimeter.

However, most modern stations have a low reading meter somewhere around, or sufficient "empties" under the tank stand, to offer the "bottle oh" as a substantial deposit on a good 0-to-1 mil-meter !!

Plug in coils are used in the Field Strength Meter, and they are tuned to the frequency of the transmitter.

The coils are wound on 1½ inch diameter formers, three coils are required, the 5 to 10 metre coil has two turns, spaced ½ inch apart with the tap at the centre.

The 20 and 40 metre coil has 12 turns space wound, to cover a winding length of ¾ inch, with a tap taken on the fourth turn from the ground end.

For 80 and upwards, 60 turns are close wound on the former, with the tap at the 20th turn from the bottom.

All coils are wound with No. 22 DSC wire.

Continued from Page 17

The field strength meter gives an actual indication of the power radiated by the antenna, this unit consists of the low reading mil-meter diode rectifier, and tuned circuit, or pick up coil.

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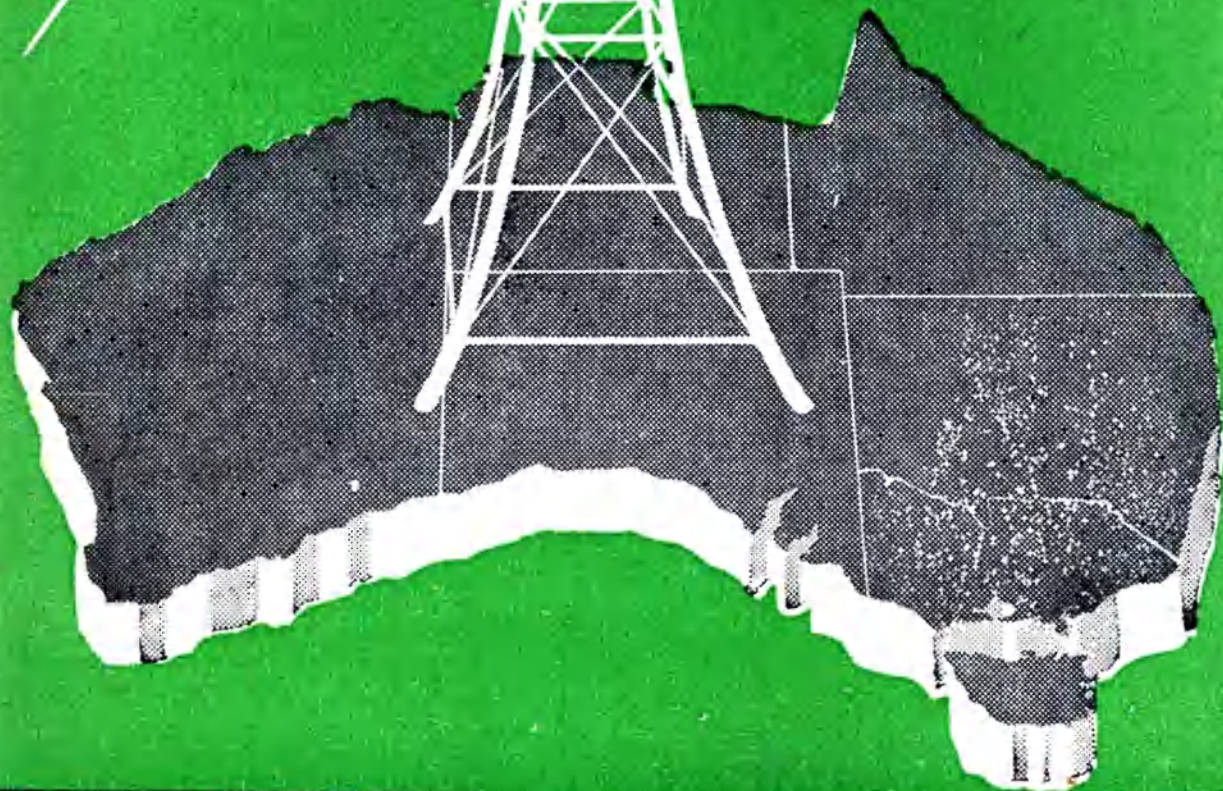
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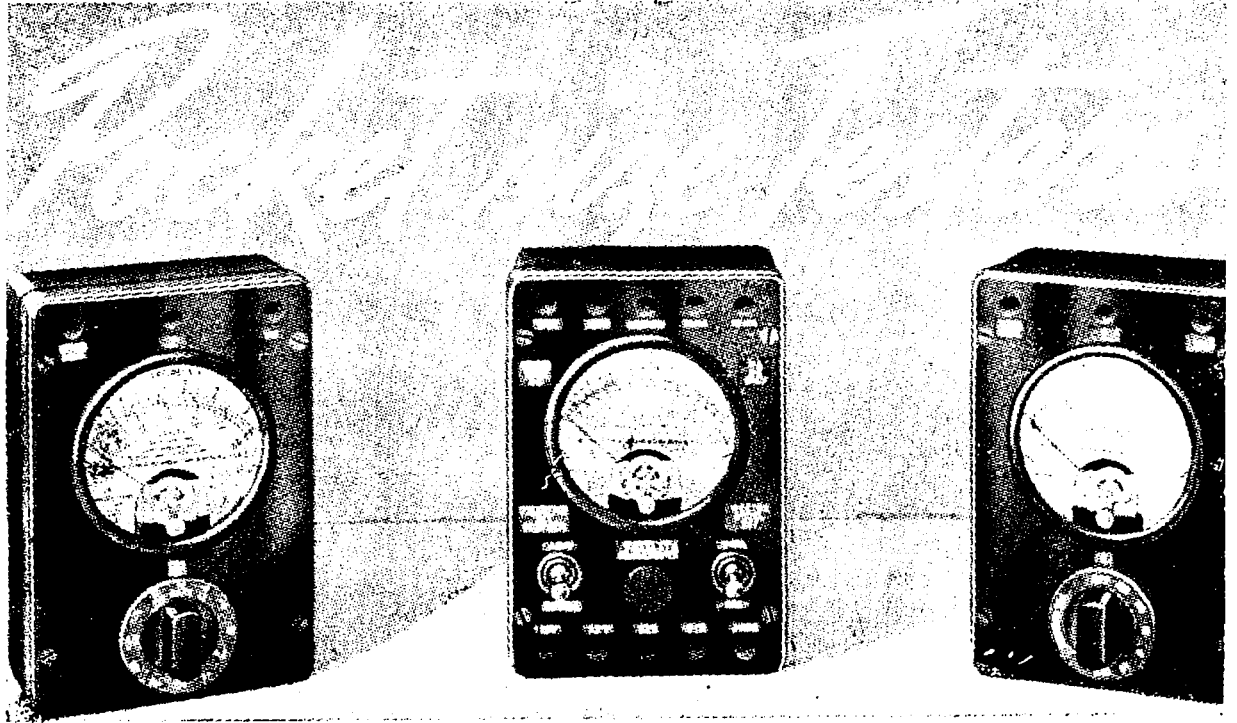
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### *Publishers.—*

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191 Queen Street, Melbourne, C.I.

### *Editorial Department.—*

W. R. GRONOW (VK3WG),  
Editor.

R. H. CUNNINGHAM (VK3ML)  
Technical Editor.

C. SERLE (VK3RX)  
Notes Editor.

V. E. MARSHALL (VK3UK)  
Compilation.

H. N. STEVENS (VK3JO)  
Distribution.

L. T. POWERS (VK3PS)  
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### *Advertising Department.—*

BEDGGOOD ADVERTISING CO.,  
129 William Street, Melbourne.  
Phone: MU 4046

Sydney Representative—

J. H. FRASER

McLaren Street, North Sydney.  
Phone: XB 2432.

Perth Representative—

R. H. ATKINSON,  
27 Rathay Street, Victoria Park.

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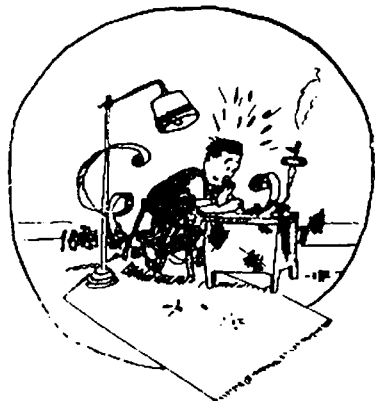
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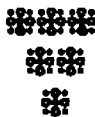


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## EDITORIAL



### TECHNICAL CONTRIBUTIONS.

.. We learn by reading. Radio progress can be watched most satisfactorily by seeing what the other fellow is doing through magazines. Where would we be without QST and RADIO as our main sources of up-to-date information? When you come to think of it, we buy someone else's brains for a few shillings a month—and imported brains at that, too. You cannot tell us that, with the world wide reputation the Australian craftsman has, we haven't amongst our own fellows budding article contributors of equal standing. The quantity may not be here with only 2000 hams to choose from, but the QUALITY lies right here in the largest island in the world. We have been extremely proud of many of our past presentations and we aim to maintain a high standard from now on. Our technical bag is fed by contributors known to us and by men who answer the call when approached. However, we can't possibly seek material from all over 2,974,581 square miles, and we look to hams and all radio-minded men to assist. This is an open invitation to all. We can all try our skill, and if it is not quite up to standard, then our technical department will lick it into shape. "Amateur Radio" was never meant to be a competitor to overseas journals — actually technical

articles were originally considered the minor section of our publication; but the mag. has improved and the technical section is gaining importance monthly. The boat is getting big now and we MUST have more oarsmen. This invitation is open to ALL, don't forget. We do ask also that photographs be clear and on glossy paper, texts be written or typed with double spacing, and only essential diagrams of circuits be supplied.

### In reply to yours . . .

Congratulations on improved magazine for August—Sec. South Aust. Div. . . . . It's something like a magazine now, good matter, good paper, good printing—VK3TL . . . . The new mag. should easily find wider acceptance among hams and advertisers alike—VK6WZ . . . . A splendid issue, most readable . . . . a fine effort—Trimax Transformers . . . . Increase our order next month — McGill's Agency . . . fb a great improvement—VK2AFJ.

Thanks! Now we want to prove it was no freak issue, so this month we increase to 40 pages. It's 40 and over from now on.

# Adjusting the Rotary Array

(Close spaced element type)

By **VK3ML**, Technical Editor

It is vital that an array be very carefully adjusted if maximum gain and results are to be obtained. From much experimental work, it has been determined that the most practical method of adjusting either a 2, 3, or 4 element array is, fortunately, also the most simple, and one that requires the least amount of expensive equipment.

The rotary beam antenna, when properly adjusted, is capable of covering quite a wide range of frequencies within one frequency band. That is to say, the antenna will respond, load well, and radiate efficiently over wide limits within the band for which it is designed without additional adjustment, when moving from frequency to frequency within this band.

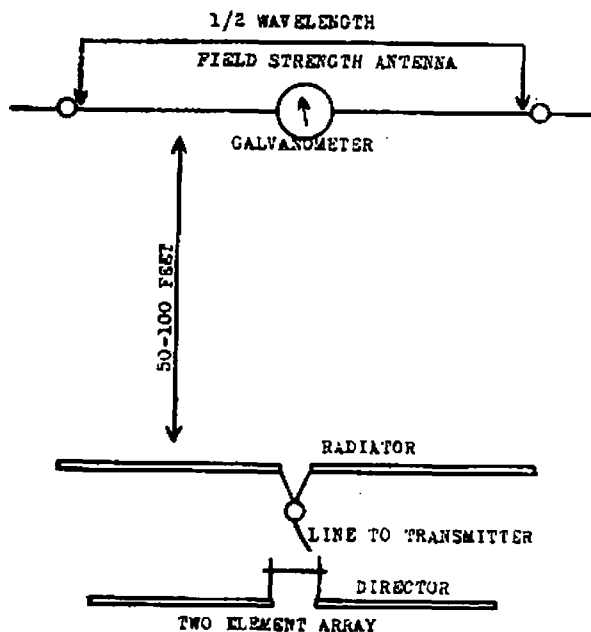
It is recommended therefore, that the array be initially adjusted for a frequency as close to the centre of the band as possible, and it is felt that if this initial adjustment has been accurately accomplished, satisfactory results will be obtained over a wide range of frequencies within this band.

## THE TWO ELEMENT ARRAY

Assemble the array. Although it is recommended, it is advisable to make adjustments after the array has been installed in its permanent location and operating height above ground, this might not perhaps be possible in many cases. Therefore a comfortable working height above ground should be chosen. Attach transmission line to radiator and transmitter.

Erect a simple half wave antenna with an R.F. thermogalvanometer connected in the centre of same at some convenient location in front of the array. This antenna can consist of nothing more than a couple of pieces of bell wire, each a quarter

wave long and connected one to each terminal of the galvanometer. Good insulation on this antenna is not important. However, this antenna must be tightly strung and very rigid. This field strength antenna **MUST** be erected in the same plane as the array. If the array is horizontal the antenna must be horizontal. Distance between the array and the field strength antenna is not too important; however it is well to erect the field strength antenna at a distance of approximately one wavelength away if possible.



At this stage, a comparatively low power level may be fed to the radiator in the array—50 watts or less will usually suffice. With the director turned away from the field strength antenna, and with the radiator interposed between the director and the F.S. antenna, slowly begin adjusting the length of the director, or stub at the centre of the director. The adjustments should be made an inch or less at a time, making sure at all times that a tight

connection is maintained. This adjustment should be continued until the **LOWEST POSSIBLE** current is indicated by the galvanometer in the F.S. antenna. When the director length which provides the lowest reading, as indicated above, has been ascertained the array will then be accurately adjusted for maximum radiation off the director side and minimum radiation off the radiator side. It then should reflect an impedance of 13 ohms and, therefore, must be fed with a transmission line capable of matching this impedance.

From a general operating standpoint, it is usually desirable to feed this type of array with a somewhat higher impedance transmission line. If this is desired, the director should not be adjusted to indicate minimum current at the centre of the F.S. antenna, but should be adjusted to bring the current down to this point. After the **LOWEST** current reading is obtained, the director should then be slightly lengthened to a point which provides a meter reading approximately 10% higher than absolute minimum. With the array adjusted in this manner, an impedance of 28 ohms should be reflected to the transmission line and, therefore, a 28 ohm line should be used between the transmitter and radiator.

After completing the adjustments as above, rotate the array 180 deg. so that the director **FACES** the F.S. antenna. It should then be found that in this position the current in the F.S. antenna will be ten times as great as in the former position with the director away from the F.S. antenna. This indicates that the power ratio of radiation off the director side to radiator side is ten to one, or that there is an increase in radiation off the front compared to the back of 10 decibels. It will be found, while rotating the array, that end radiation will be so low that it may be considered negligible.

#### FOR THE 3 ELEMENT ARRAY

Assemble and install the array following the same procedure as outlined above for the two element array. Also erect the F.S. antenna in exactly the same manner as outlined above, keeping in mind that the F.S. antenna **MUST** be in the same plane as the array.

Feed a low power level (50 watts or less) to the radiator as outlined above, with the **REFLECTOR** facing



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the F.S. antenna and disconnected at the centre stub. If no tuning stub is used, be sure that the reflector is broken at the centre, so that it will not affect the initial adjustment of the director.

Now, begin adjusting the DIRECTOR stub, or length of the director for LOWEST current in the F.S. antenna, and leave the director adjustment at this point.

Next, allowing the DIRECTOR to remain connected, reconnect the REFLECTOR and adjust the centre stub or length of the reflector, until a still LOWER current begins to appear at the F.S. antenna. Continue adjusting the REFLECTOR until the LOWEST possible current is indicated in the F.S. antenna.

The array should now be rotated 180 deg. so that the DIRECTOR faces the F.S. antenna. It is now well to readjust very slightly the length of the DIRECTOR to a point which provides absolute maximum current as indicated by the galvanometer in the F.S. antenna. When this position is located, the three element array will be correctly adjusted, should provide a front to back ratio of approximately 1000 to 1, and should reflect an impedance of 8 ohms to the transmission line. Therefore it must be fed either with an 8 ohm transmission line or with a transformer capable of providing the correct transformation ratio between an open wire line and the radiator.

#### FOR THE FOUR ELEMENT ARRAY

Assemble and install the four element array in the same manner as outlined for the two and three element arrays. Set up the F.S. antenna at the same distance away from and in the same manner as previously indicated. Be sure that the F.S. antenna is in the same plane as the array.

With a power level of about 50 watts being fed to the radiator and with the REFLECTOR facing the F.S. antenna but disconnected at the centre, adjust the DIRECTOR which is closest to the radiator until a minimum current appears in the F.S. antenna.

Now, adjust the second DIRECTOR which is farthest from the F.S. an-

tenna until a slightly lower current is indicated in the F.S. antenna. The first director should be connected and left at its previous setting while adjusting the second director.

Reconnect the centre of the REFLECTOR and adjust for a still LOWER current reading at the centre of the F.S. antenna. The array may now be rotated through 180 deg. so that the F.S. antenna is in front of the array, faced by the DIRECTORS. It may be well now to check the adjustments of all elements, and may perhaps be necessary to readjust somewhat the length of the DIRECTORS. These should be adjusted with the array in this position for maximum or HIGHEST current in the F.S. antenna. When adjustment of the four element array is completed, the forward gain should be 13 decibels over a reference horizontal dipole erected in the same plane and at the same height above ground. The front-to-back ratio should be 35 DB, which is equivalent to a power ratio of 3162 to 1. The impedance of the array should now be approximately 5 ohms. The four element array, therefore, should be fed either with a five ohm transmission line or with a suitable transformer working in conjunction with an open wire line.

It has been ascertained from experimental work that the above procedures are perhaps the most accurate that can be followed in the adjustment of a multiple element beam antenna. Field strength meters of the electronic type are probably capable of performing the same task. However, many variable factors are encountered with this type of equipment. These may include gradually lowering battery voltages, body capacity effects etc., which tend to produce overall inaccuracies during the period of time involved in completing the adjustment. Most F.S. meters of the electronic type also usually employ some form of vertically polarised antenna of a comparatively short length. By reason of this fact, the checking of horizontally polarised wave emanating from an array may produce many inaccurate measurements.

One word of caution: Be sure that the R.F. thermogalvanometer employed is of reputable make, as cheap meters are not suitable in this service. This meter should preferably have a 0-100 scale.



**BIASED.**

By VK3OC.

My friend Olsen called to see me that other night after a long absence, and after assuring myself that he did not want to sell me a couple of tubes or a transformer, I reluctantly let him into the shack. When I first made his acquaintance he told me that he left the fjords in Norway many years ago, to which I replied that I did not know they made Fords in Norway many years ago, and anyway, why leave them there unless the duty and primage was too high. After sorting ourselves out and coming to the conclusion that he meant fjords, he then proceeded to tell me the old story about becoming a ham, living a few doors away, and what did I think of the idea of a vacuum tube without a glass envelope. I told him I did not think much of it, but he insisted that without a glass envelope the tube would operate with much higher voltages without heating up. At this stage, being much younger and stronger than I am to-day, I threw him through the window, and heard no more of him until a frenzied blurb-blurp-a-blurp, almost shattered my eardrums when listening for an elusive country a few nights later.

However, Olsen in due course became a good ham, and a key in hand meant the world by the tail. He was amassing a string of countries as long as a refugee's overcoat (RX told me that one), when summer came and the blow fell. Being moved one day to go and immerse his body in the bay at Elwood, he fell foul of a dizzy blonde by the name of Toots, who, appeared before him in a bathing costume that revealed practically everything except the filling in her back teeth. Having some Scandinavian blood myself, I can understand his susceptibility, and to cut a long story short, he was hooked in less time than it takes to QSO a Yank. Needless to say, peace reigned in the ether around our way, and my own DX score began to mount again. This was interspersed with sundry visits from Olsen, with the object of trying to

sell me a few meters, tubes, and transformer or two, and what have you. However, being married and full of troubles, and having been through the mill myself, all he was successful in getting from me was some good advice, which he promptly ignored.

This brings us pretty well up to date, and if you have borne with me this far you will understand why his last call was greeted somewhat suspiciously. The story he told removed all doubts. It would appear that the shapely Toots had some months before instigated an economy campaign with the object of having Olsen save up his hard earned piastres for the purpose of buying a ring and making things all legal like. The saving being accomplished, what does Olsen do but get the ham radio bug again, and busts the lot on a heap of new gear which would almost make 6ITH envious. And what does the beautiful Toots do but drop him cold, and last heard of she had taken up with a guy whose hobby was cine-photography, and who knew a fellow amateur in Hollywood who knew Cecil de Mille's third yes-man, and maybe if she was good she might get into the movies really.

So that's the story of Olsen, and it all goes to prove something, but just what I don't know. I do know that the blurb-blurp-a-blurps have started, and that Olsen is adapting the family clothes hoist to a rotating beam, and I expect him around any time to tell me that he has re-invented a grid leak drip pan. But after measles, I'm too weak to throw him out the window again.

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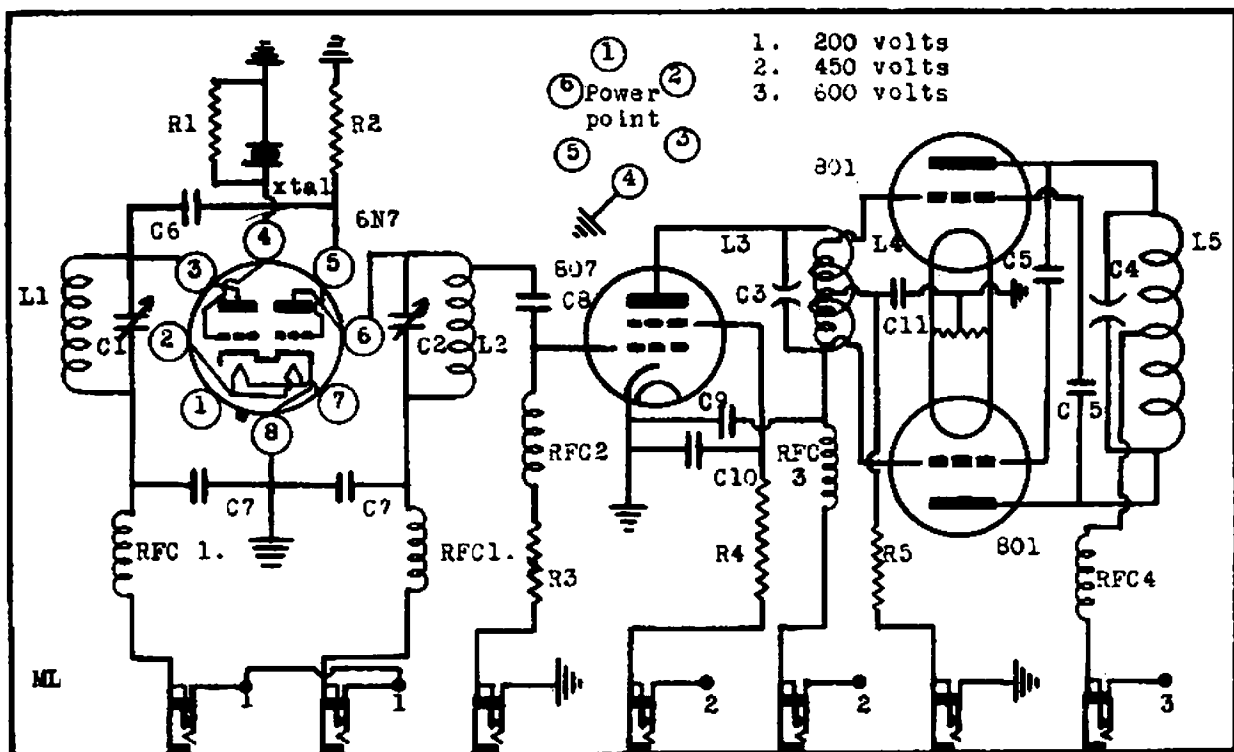
# A 100 Watt C.C. Signal on 56 m.c.

By Leo Guest, VK3GG

In order to take the first step in an endeavour to establish contact with real DX stations on five metres a transmitter was planned that would provide a solid and stable signal; in other words, moderate power and definitely quartz controlled. With modern communications receivers and the hope of hearing CW signals nothing but a stable transmission would satisfy. At the same time, as five seems to be a home for phone operation, a modulated amplifier that would stand deep modulation was very necessary. Most fortunately the transmitter described here performed perfectly first pop—that is, with the absence of parasitics and degener-

ation, that were fully expected in a push pull neutralized amplifier on this high frequency. These missing features were probably due to a planned layout that provided for short leads and interactionless layout of components.

Starting from a pair of 801s and a 28mc Bliley rock on hand a few trials were conducted with exciter layouts to see what hook-up would give the optimum results with a minimum number of stages and gear. Two articles were borne in mind in the preliminary stages; firstly, that by Wolfskill in QST for January 1938 under the heading of "56 mc Crystal



C1 85 m.mfd variable.  
 C2 50 m.mfd variable.  
 C3 12 m.mfd neutralizing condenser.  
 C4 12 m.mfd neutralizing condenser.  
 C5 2-12 m.mfd midget variable.  
 C6 100 m.mfd mica condenser.  
 C7 0.01 mfd mica  
 C8 30 m.mfd concentric condenser.  
 C9 0.002 mica.  
 C10 0.1 mfd mica.  
 C11 0.002 mfd mica.  
 RFC1 Eddystone type 1011 chokes.  
 RFC2 Eddystone type 1010 chokes.  
 RFC3 Eddystone type 1022 chokes.  
 RFC4 Eddystone type 1022 chokes.

L1 8 turns 14g  $\frac{3}{4}$ -in. diam. for 28mc xtal.  
 L2 3 turns 14g  $\frac{3}{4}$ -in. diam. for 28mc xtal.  
 Winding length, 1-in.  
 L3 4 turns 14g 1-in. diam.  
 L4 6 turns centre tapped.  
 $\frac{3}{4}$ -in. diam. winding length.  
 L3 and L4—3-in.  
 L5 5 turns 14g 1-in. diam.  
 Winding length, 3-ins.  
 R1 50,000 ohms 1 watt.  
 R2 30,000 ohms 1 watt.  
 R3 50,000 ohms 2 watt.  
 R4 25,000 ohm voltage divider.  
 R5 3000 ohm voltage divider.

Control with 28 mc Crystals," and the other by VK2GU, "Power tuning Condensers for Ten and Five," in A. R. for October 1938. In the first article, recommendations were made for the use of tubes like 6J5G, 6E6, 8O2 and RK34. The 8O2 as a tri-tet doubling to 56 mc seemed the berries; but, no matter what connections and changes were effected the only output that could be realised was that just sufficient to drive the writer coo-coo — the match was finally abandoned. A valuable 6N7, not earning interest on its capital investment on the shelf, was then eyed with suspicion, but, as Mr. Wolfskill said, "6E6 or RK34 would actually work," the oscillator layout was altered to take the allied 6N7. With leads about as long as terminal lugs and silver plated coils with ceramic bases of the Eddystone vintage for the tank coils an output of 56mc in the second triode section, that was more than ever hoped for, was obtained. As a matter of fact, this tube functioned nearly as well as a quadrupler from 14mc crystals as it did as a mere doubler from 28mc. In any case, both crystal fundamentals are used for driving the

buffer stage — the 807, to its full output with the rated 5 mills grid drive. So the chap who does possess a 28mc rock is no better off than the owner of a 14mc cut under these conditions. Ten metre crystals creep very considerably and an oven has had to be installed for this transmitter, but that will be described later.

The 807 seemed the logic tube to use as a buffer; the only feature to be avoided being self oscillation. This was checked by placing the grid coil under the chassis and the plate tank on top. (By the grid coil is meant the plate coil of the 6N7 doubler section, as the 807 is straight capacity coupled therefrom.) Now this is where VK2GU's recommendations were heeded. A disc type neutralizing condenser was used to tune the 8O7 tank circuit hitting resonance at about 3m.mfd capacity. There is no doubt that the low capacity tank speaks for itself, judging by the plate mills dip and no trouble is experienced in giving the 801s 50 or more milliamps grid drive. No neutralization was necessary for the 807 and the only shielding being a tube can run half way up the valve

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from the chassis. Insulation losses were kept down to a minimum in the plate tank by screwing the coil straight onto the disc condenser which is made from Frequentite 30,000 volt pillar insulators. Here again, silver plated coils would have been used if they had been available in the desired diameter. However, the next best coating, enamel, 14 gauge wire made up a sufficiently rigid coil requiring no supports other than at the ends.

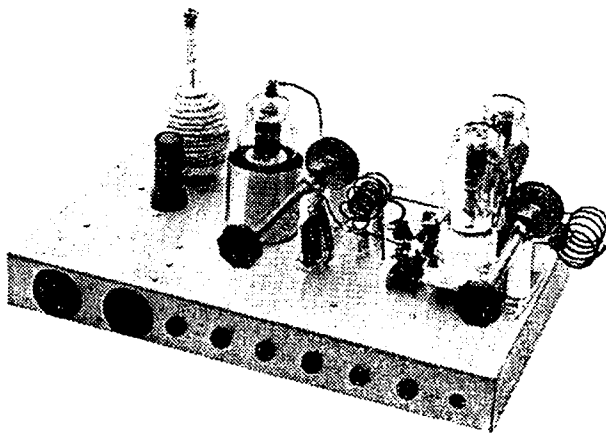


Fig. 1. The 6N7 oscillator-doubler tube with the crystal oven are at the left immediately followed by the 807 with the Disc type tank condenser tuned by the extension control shaft. Unity coupling to the 801's is provided by the RF transformer with the secondary wound inside the plate coil. The Eddystone 1032 midget condensers mounted inverted on the chassis neutralize the 801's. Note relatively large tank inductances used with low capacity plate condensers.

Coupling the RF from the buffer to the P.A. stage proved no worry as straight transformer coupling could be employed doing away with link losses and mis-matches. The 801 grid coil was wound to fit inside the 807

plate tank and is untuned in order that maximum voltage could be developed at the 801 grids. The tuning of the buffer tank coil had sufficient "pull" to draw the grid tank into resonance.

Neutralization of the 801s offered no difficulties with the small 2-12 m.mfd spaced midget condensers. As 2GU recommended, a "single ended" disc type condenser was employed in the 801 plate circuit. It only required a centre tap on the grid coil to complete the necessary bridge balance and a centre tapped plate coil for the HT feed. A perfect balance was obtained that led to easy neutralization, that may have proved difficult with a standard split stator condenser in the plate circuit owing to the likelihood of a capacitive unbalance between sections in this type of condenser. The 801s, under pressure of 600 volts, take 250 milliamps off resonance and dip to about 30 mills when tuned. This performance is certainly high for 56 mc and with the concentric line fed coaxial antenna a single turn coupling coil pulls the plate current up to 150 mills and more, depending on the power output desired and modulator requirements.

Having briefly described the reason for this layout and the performance which the unit gives we can now consider the practical design and circuit details.

The whole transmitter is made on an aluminium chassis measuring 18 x10 inches and 3 inches deep. In order that the one milliamp meter might serve all purposes insulated closed circuit jacks (7 of 'em) are

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seen in the picture mounted along the front. They provide the following readings:

- Plate of 1st section 6N7
- Plate of second section 6N7
- Grid current to 807
- Screen current to 807
- Plate of 807
- Grid current to 801s
- Plate current to 801s

The dials to the left of the chassis are attached to the 6N7 plate tank condensers. Insulated extension controls are used for the disc type condensers as the threaded spindles are "hot." For the sake of short leads the plug in coils in the 6N7 plate circuit are mounted underneath the chassis and along side the tube socket. With the HT fed through UHF chokes and well by-passed at the low potential end of the tanks no trouble of self oscillation in the 6N7 was experienced.

The circuit shows the wiring of the 6N7 as seen from the bottom of the chassis and gives a clearer idea of how the components fall into place for the short leads. Tuning of L1

and L2 by C1 and C2 are as for any twin triode oscillator circuit and the

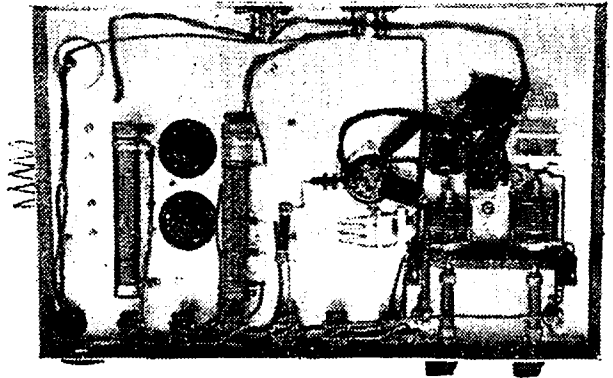


Fig. 2. Inverted view of the works. The layout of the 6N7 stage permits short RF wiring. Eight turns of the silver plated coil on the extreme right tune the 28mc xtal tank with the three turn 56mc doubler coil at the left which lies adjacent to the grid contact of the 807. The lead-through insulator at the left feeds the 600 volt H.T. to the 801's.

dip is very pronounced in both plate circuits. A check on the doubler frequency may be necessary to ascertain



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whether 56mc has been picked off alright. Bliley do not recommend voltages above 200 for the 6A6-6N7 type tube with H.F. crystals — not that it would be necessary because no difficulty was experienced in obtaining 5 mills grid drive to the 807 on 5 meters.

Grid leak bias was chosen for the 807 grid because it is simply the most economical system and allowed the cathode to be grounded directly, which might otherwise cause a spot of regeneration when a wire wound resistance is placed in series at this U.H.F. A small concentric variable coupling condenser linked the 6N7 to this stage and one having a maximum capacity of 30 mmfd was sufficient to obtain 5 mills grid current and not overload the 6N7 doubler tank.

Only by means of cut and try could a coil be made for the 807 tank circuit with the small 2-12 mmfd disc type condenser for tuning. Even when the right number was found, the final adjustment to obtain as high a C as possible was made by spreading

the turns out or pressing them in as required. Turns spacing makes a very considerable difference to the inductance on 5. At this stage the 807 was checked for performance with the HT on, and a dip was registered from 150 to 30 mills, which is quite fair.

Driving the 801s was the next problem and, again, only a juggling of the grid turns would give the necessary grid current. Neutralizing was a cinch and worked like an 80 meter transmitter. The 2-12 mmfd midgets covered the range necessary for the 801 tube. 30 mills were recorded in the 801 grids, which is their rating when in push-pull. When the tank turns for the P.A were corrected the dip mentioned before of 250 to 30 mills was obtained. We now had a transmitter that was stable and delivered plenty of RF. This was checked up after connecting up the 6L6 modulators and obtaining local reports. "B.C quality with a sock" was the richest reward for careful design and layout.

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# Crystal Oven

USED IN 100 WATT TRANSMITTER FOR 56 MC

By VK3GG.

In furnishing the following Article re an easily constructed Crystal Oven, I would like to state that it is open for further experimenting, although rather critical tests were undergone as to its stability.

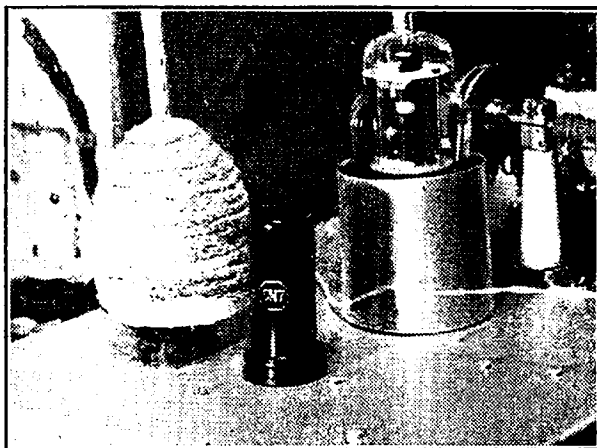
Using a Bliley 10 meter Crystal in the original Oscillator Circuit, it was found to drift many K.Cs. The incorporation of this little Oven, however, and giving the Transmitter time to warm up, soon showed favourable results; and parts used:—

- One old Radiator Cone with wire taken off, and replaced with Asbestos Cord.
- 2 2.5 Pea Lamps, and 2.5 v. supply.
- 1 Thermometer reading to 120 deg. fah.
- 1 small tin of Insalite (Liquid Porcelain)

The Crystal and Holder is placed in the open end of Cone, and sealed with Insalite. Two holes drilled in sides for Pea Lamps, and one in top for Thermometer, and again sealed with Insalite. A Crystal of 28.006 K. Cs was used and measured in the laboratory at 80 degrees fah. Variation of same is 43 cycles per megacycle, per degree centigrade.

In regard to any frequency above 80 degrees fah. it was found to be perfectly stable at 84 degrees fah., with one bulb on. For summer conditions both bulbs will be used to get above maximum room temperature.

This is only a suggestion for the amateur who really wants a stable signal, and where the necessary parts are obtainable from most junk boxes.



The oven is mounted right over the Bliley crystal holder. Approx. 80 def F. is maintained with the pea lamp bulb heaters.

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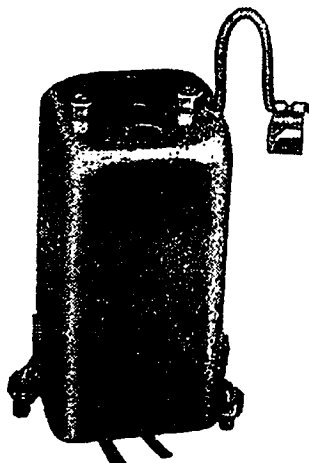
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# Concentric Feed-Lines

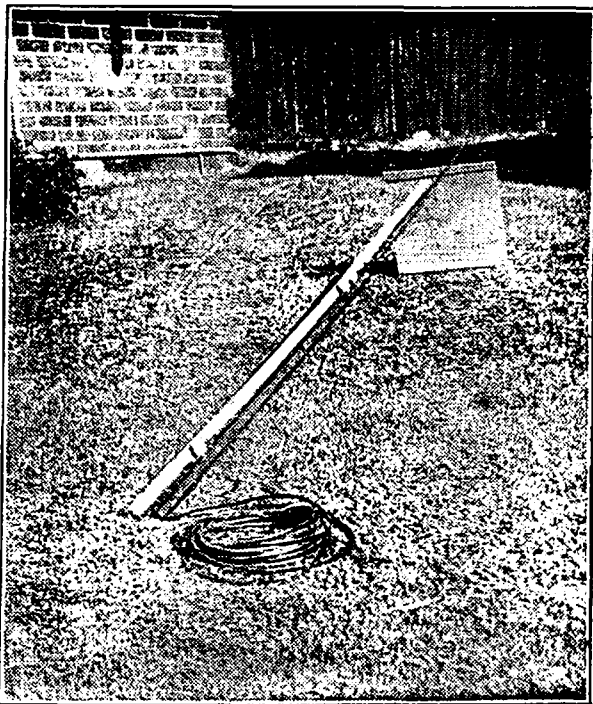
## A Point to Watch

By Don. Knock, VK2NO

It is at the U-H-F's that the merits of feed-lines of the concentric type are really emphasised, as anybody will realise after attempts to push R.F. at 56 M.C. along 60 feet or so of twisted pair. What gets to the radiator with some of these twisted affairs wouldn't be enough to singe a gnat's whiskers, where the line is anything more than about 15 feet long. It's a different story with cable of the Bassett 64/200 type, and 100 feet or so doesn't appear to have any really serious loss at 56 M.C. It goes without saying that the lower frequencies are better still. In the course of testing various coaxial aerials fed with Bassett 64/200 around Sydney, an interesting point was revealed—one that is not readily apparent. But when the writer ran across it, the obvious smote through the fog of doubt like an ultra-violet ray.

Such excellent results were obtained with the 56 M.C. coaxials at VK2NO and VK2EM, that others were persuaded to do likewise. One week-end, 56 M.C. tests were run off with certain craft at sea and one station using a coaxial to specifications, fell far short of the expected results. Using the same gear in his home location, rough tests with an absorption meter near the coaxial aerial showed that there was definitely more R.F. indicated in a plain doublet fed with twisted pair. This just didn't make sense and the cause of the deficiency was sought for several days over morning coffee in the city. Suddenly the light dawned. The doublet antenna had 12 feet of twisted cable straight to the radiator from the TX. With the coaxial, 30 feet of Bassett cable was used, but because both aerials were used in a small room for the tests, about 10 feet of this cable was left lying **coiled** on the floor. Going along the Bassett cable with the absorption meter showed no line radiation until the coiled portion was reached, and then the indicator lamp lit brightly. There was some R.F. in the radiator, but not very much. Straightening out the cable cleared up the trouble. Those coiled turns were either acting as an efficient R.F. choke at 56 M.C., or the

impedance of the line was considerably altered, providing a bad mismatch at the radiator. When the aerial had been used at sea for the week-end tests, the cable had been coiled for almost the whole length, and just dropped on the deck behind the transmitter. Subsequent tests of



A 56 MC Coaxial Aerial made by VK2NO as described in "A.R." August, 1939.

reception at a station 14 miles distant when the cable was straightened out at the home location, showed, on an accurately calibrated S meter, a gain of 8 Db. with the plain coaxial over the twisted pair doublet. Coincidentally, that gain is just what W.E. engineers claim for the coaxial over a plain half-wave radiator. The point then, when using flexible concentric feed-line is to avoid any complete loops in extra length. The line need not be straight by any means, but the straighter the better. Bends at right-angles don't appear to be serious. Best way of course is to instal a feed-line to the radiator as straight as possible, and simply cut the cable to the required length. An odd length left over from a 50 feet coil will be useful anyway for links in transmitters and other purposes.

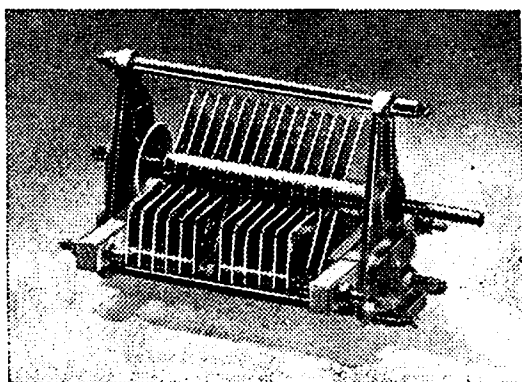


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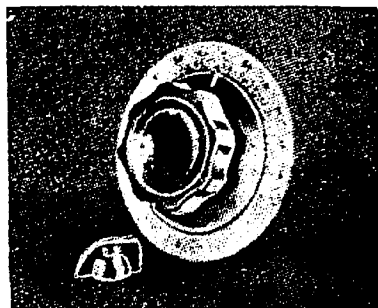
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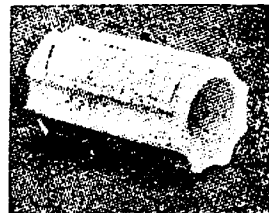
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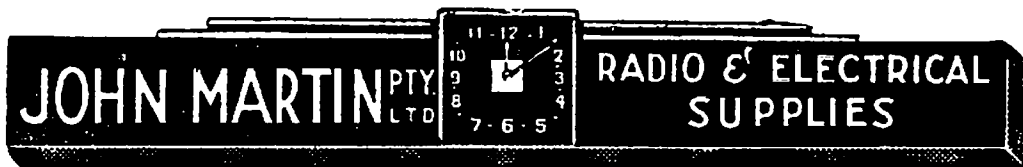
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# The W8JK Beam Antenna

By R. E. Trebilcock, VK3TL

This article is written for those Hams who have not the wide open space in which to erect a Vee Beam antenna such as is described by VK3BM in the August number of "Amateur Radio," but who desire something better than a half-wave zepp. For such there are few, if any, arrays to compare with the Kraus Beam, or "W8JK Beam," as it is familiarly called.

This antenna has several distinct advantages:—

It is very compact.

There are no structural difficulties, and

Measurements are not critical.

The beam is comparatively wide, but nevertheless

The gain is substantial.

It can be centre fed or end fed to suit circumstances.

It can be Zepp-fed, or a stub can be used if preferred.

Lastly it is not costly.

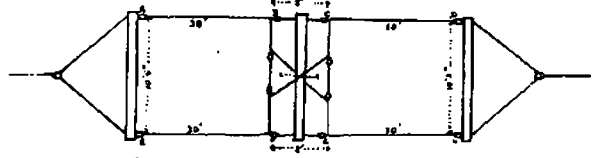
Incidentally it is also a good receiving aerial with marked directional properties.

I shall first describe a centre-fed, two-section beam, with zepp feeders, for use on the 20 metre band. Essentially, it consists of two parallel full wave antennae spaced at approximately  $\frac{1}{2}$  wave-length and transposed at the centre. The antennae are fed 180 deg. out of phase. The result is that each acts as a powered reflector to the other, and the maximum radiation is in the plane of the elements and at right angles to their length. There is little radiation end-ways and practically none vertically—hence the gain in other directions.

**Spreaders:** Fig. 1 shows the construction of the array. It will be seen that three light spreaders are required—1-in. x 1-in. oregon will do nicely. The distance between the elements should not be less than .1 of a wave length, the optimum being .15. A lower value than .1 results in rapid falling off of gain.

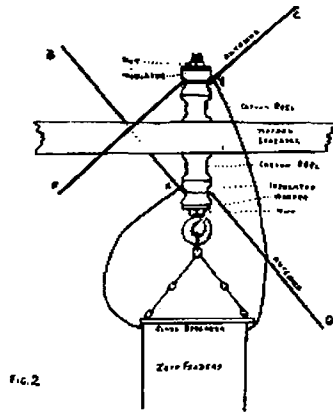
**Measurements:** The measurements shown in Fig. 1 are calculated for the middle of the 20 metre band, and will give satisfactory results all over the band. The cross wires B-G and C-F should be 10-ft. 8-in., and the feeders must be attached exactly in the centre. Care should be taken

that the measurements from the point of attachment of the feeders to the ends of the antennae are all the same. The spreaders should not be shorter than 10-ft. 5-in., or some of the gain will be sacrificed.



**Insulators:** Single insulators are shown in the diagram for sake of simplicity, but it is advisable to use two or more egg insulators close in series. They are cheap enough.

**Feeders:** It will be noted that the wires B-G and C-F cross over in the middle. For centre-feed the zepp feeders must be soldered at these mid-points. Where the radiators cross over they should, of course, be kept apart electrically, and be insulated from the spreader. A good plan is to pass one above and one below the middle spreader and to



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support each on a stand-off or reel insulator.

**Mechanical Attachment of Feeders:** If the cross-over wires were made to carry the weight of the feeders, they would tend to draw the antennae together. Hence the weight of the feeders is taken by the aerial spreader.

It is desirable to equalize the tension of the feeders, not only between each side of the aerial system to avoid accidental tilting of the array, but also between each side of the zepp-feeders to avoid their hanging askew. It is also desirable to have such a connection between the feeders and the aerial system as permits of a variation in angle between the two, in case it is desired to experiment with the direction or tilt of the array. The diagram (Fig. 2) shows how this may be done. The diagram is self-explanatory. The threaded hook is about 5-ft. long and 3/16-in. diameter. The two reel insulators may require to be plugged with wood bored to take the hook. The wires W-X and Y-Z should be of equal length, and it may be necessary to use a length of glass tubing as an insulator to keep them in their correct places. Insulating tape will secure the tubing, especially if 1/2-in. of each end is roughened on an emery wheel. The X and Y represent the mid-points of the cross over wires. These wires should be fastened to the reel-insulators with insulating tape.

The practice of terminating a zepp with a good insulating spreader and a yoke of insulators with suspension at the apex and flexible jump-over wires for the electrical connection is worthy of general adoption for zepp. connections.

(Continued on page 35)

## TRADE FLASHES.

**John Martin Pty. Ltd.** announces that the new range of "Raymart" tuning condensers will be found to have the following advantages over other types.

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## 28—56 MC Notes

By A. Pritchard, VK3CP.

The band is beginning to show plenty of life again, although conditions are rather patchy at present. Considering the strength of the Europeans on 20 meters during the afternoons, we should be hearing them on 10 in the near future. No South Africans have been heard although the K6's contact them fairly easily. Several South Americans have good strength at present and we can expect the northern states of S.A. to come through.

W6PMB tells me he has contacted the following and is telling them to keep a look out for VK's and ZL's — PY4CT, PY3EN, PY2MI, CE3AG, CE3CZ also LU8AB, LU5AN, LU1DJ who are all up the low frequency end. George of VK4JP is giving us very fine signals during short skip and two close spaced rotary beams driven from a rig having a bi-push excitor and HK54 final modulated by a pair of 443's; gives a good account of itself. VK3XP is altering the feed system to a  $\frac{1}{4}$  wave coaxial stub and open feeder line. Bassett 64 ohm cable is ideal and used with a 500 ohm line would match a 3 el. job nicely. The imped. of antenna centre multiplied by the imped. of  $\frac{1}{4}$  wave section, gives necessary impedance of open line to use. Arch. of 3BW and Geoff. of 3DA have been testing on 56 mc and as it is approximately 25 miles across the Bay, this should be a good distance for tests. 3DA and 3YL have perfect signals. 3GG has xtal, from a 6N7 10 mx xtal, 807 doub., 801's PA, excellent stability and quality. 3JO puts the R meter hard over. An interesting antenna used by W6FZC, having  $8\frac{1}{2}$  waves, is of the barrage type. The following dimensions halved would be ideal on 56 mc. The general shape is similar to a pair of lazy H types in line with the feeders connecting to the transposed feeder between each. The following are the sizes — vertical 17 ft. wire connecting to horizontal 8ft. 6in. sections above and below, next 17 ft. sections with vert. transposed feeders between

another pair of 17 ft. sections and 8 ft. 6 in. sections with more transposed feeders between each set and the last small section connecting to another vertical 17 ft. wire between ends. The main feeder if connected to a  $\frac{1}{4}$  wave stub, connected to the centre transposed section.

VK3QD is re-building for 10 meters and a pair of HY40's completes the final. W6KYT tells me they are having many Aurora displays there and they co-incide with similar displays seen by ZL4AO. They have disrupted telegraph services in the States and evidently account for the dead band on that date, i.e. 13th Aug. W6KYT was qso'd at last by 3BQ. He is old W6BQR who received Max's report on his 160 metre cw, away back in August '24. This brings to mind the first Aust. — U.S.A. and European — Aust. contacts, by A3BQ and W6AHP and G2OD respectively, both in November of the same year.

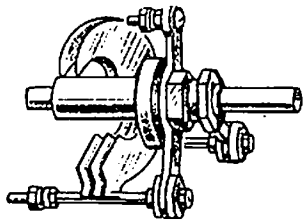
3YH is completely re-building too, 42 co 40x, 6L6 doub., T40 PA — 6C6 (tri) 76, 42 (tri) 6L6 g's modulator. Fred is winding his own universal mod. trans. from May '38 Radio (U S). K6PLZ teaches Radio-Physics and Chem. at the local high school, so can really talk about ants. and calculations. Tommy makes an interesting contact. VK7AB is in great demand in the States, as Tasmania is considered a separate country. A 135 ft. long wire ant. with centre feed tuned feeders will soon be replaced with a 4 element rotary for 10.

The following give some variety at present — VP3CO, VP6YB, PK6XX, TI2FG, K5AT, K4FOW. Let us hope we can add a few Europeans to the list in the near future. The contest has taken the interest of many, although 10 has not given any help. Many who have tried more than the 3 elements have found they put a better average signal over with the 3 element outfit, evidently the angle of radiation is too definite for the greatest number of stations at such varying distances.

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## Contest Section

R. E. Jones, VK3RJ, Federal Contest Manager.

### REMINDERS.

The VK-ZL 160 metre CW Contest takes place on September 2nd. Full details were published in the June issue of "Amateur Radio."

The All Band VK CW Trophy, commences on 16th September, and concludes on September 24th. Rules appear in the August issue of this journal.

### 1939 VK-ZL DX CONTEST.

During 1939 New Zealand is celebrating her 100th Birthday, and the New Zealand Association of Radio Transmitters, Inc., co-operating with the Wireless Institute of Australia, will organise and control the VK-ZL Contest as part of the Centennial Celebrations.

The Contest is divided into three sections, viz., Senior Transmitting, Junior Transmitting, and Receiving. The Senior Section embraces a power limit of 150 watts input to the Final Stage. The Junior Section is limited to 25 watts input to the Final Stage, and this limitation is an endeavour to cater for the interests of the QRP enthusiast.

Six valuable trophies have been provided and will be awarded as follows:—

(1) One trophy to each of the following winners of the various divisions of the VK-ZL Contest: (These four awards will be won outright).

- (a) Station in VK or ZL scoring the greatest number of points in the Senior division.
- (b) Station in VK or ZL scoring the greatest number of points in the Junior division.
- (c) Station outside of VK or ZL scoring the greatest number of points in the Senior division.
- (d) Station outside of VK or ZL scoring the greatest number of points in the Junior division.

(2) Two handsome silver cups known as "The N.Z. Centennial Cups" will be awarded as follows:—

- (a) To the station in VK or ZL amassing the greatest total of points as set out in Rule 15 of "N.Z. Centennial Cups."
- (b) To the station outside VK or ZL amassing the greatest total of points as set out in Rule 15 of "N.Z. Centennial Cups."

The two N.Z. Centennial Cups will be held only for twelve months by the winners, whose names will be engraved thereon. Winners will receive miniatures for retention after handing the Cups back to the Contest Committee.

In addition, Certificates will be awarded to the highest scoring stations in each country. In making these awards, each W, G, VE, VK and ZL prefix will rank as separate countries. In order to obtain a certificate, it is necessary for the contestant's score to exceed 400 points.

The awards for the receiving contest will take the form of certificates, and will be awarded to the highest scoring stations in each country.

A plea is made to all participants to send in a log, irrespective of the number of contacts made. As an inducement, a special verification card will be sent to all amateurs who send in a log.

### RULES.—SENIOR TRANSMITTING CONTEST.

1. The New Zealand Association of Radio Transmitters Inc. Contest Committee shall be the sole adjudicators and their ruling will be binding in cases of dispute.

2. The nature of the contest requires the world to contact VK and ZL. Six cypher serials are to be exchanged. The first three characters to be the RST of the station received and the last three the number of the QSO. For example, ZL3AZ may be in contact with G6CL and would send 579072. That would mean that ZL3AZ was receiving G6CL at RST 579 and that G6CL was ZL3AZ's 72nd QSO in the contest.

3. The contest is to be held from 1200 GMT Saturday, 30th September, 1939, to 1200 GMT October 1st, 1939, and repeated over the same time period during the next weekend, namely 1200 GMT Saturday, 7th October, to 1200 GMT Sunday, 8th October, 1939.

4. The contest is open to all licensed transmitting amateurs throughout the world. Unlicensed ship and expedition stations are not permitted to enter the contest.

5. Power input to the Final Stage is limited to 150 watts. Where the national regulations of any country

do not permit the use of this power, participants in that country must not exceed the power allowed them by the said national regulations.

6. Only one contact with a specific station on each of the bands will be permitted during the contest.

7. All amateur frequency bands may be used.

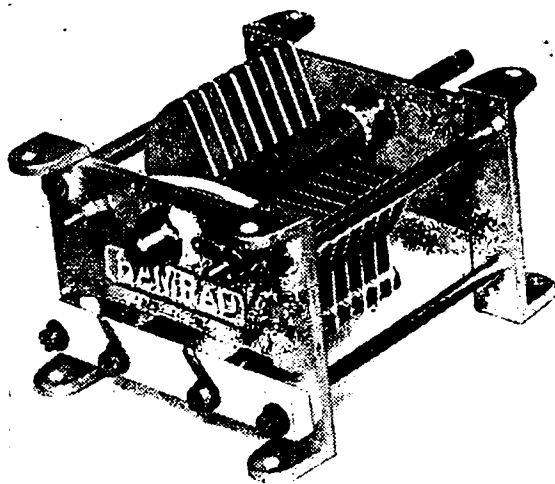
8. Only one operator is allowed to work any station. Where more than one operator has worked a station, individual logs must be forwarded under the call sign of each operator, and each operator will be considered a separate competitor.

9. **Scoring.**—12 points will be scored by the first contact with a station outside VK-ZL, 11 points for the second and 10 points for the third, and so on until the twelfth will score 1 point. Thus the first twelve contacts will score 78 points and each additional contact after the twelfth contact will count one point. In all cases contacts are irrespective of the band used. This will apply to all countries except England and the United States of America; in these countries twelve or more (as above)

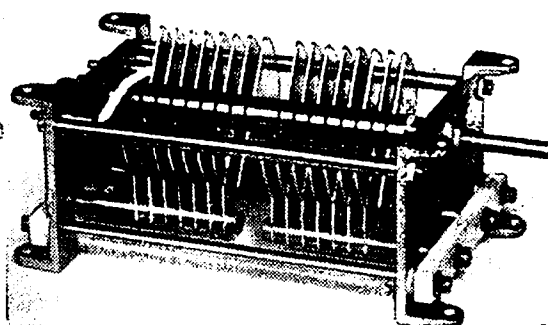
contacts will be permitted with stations having the following prefixes: G2, 3, 4, 5, 6, 8, GI, GW and GM, and W1, 2, 3, 4, 5, 6, 7, 8, 9. The points by contacts in the above manner will be added together and multiplied by the total number of countries worked on all bands, which will give the final score. Each W and G district will not constitute a separate multiplier. It should be noted that where say 10 countries are worked on one band and the same 10 on another band, this constitutes a multiplier of 20.

10. **Scoring by competitors beyond VK-ZL.** 50 points will be scored for the first contact with a VK-ZL zone, 45 for the second, 40 for the third and so on in steps of five points until the tenth station worked in that zone will count five points. Thus the first ten stations worked in any particular zone will score 275 points. Thereafter, each additional station worked in that zone will count five points. The points scored in the above manner will be added and the total multiplied by the total number of prefix zones worked on all bands.

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in the third edition of the "Radiotron Designer's Handbook.")

The audio stage of early radio receivers used triode valves coupled by means of interstage transformers, which usually had a step-up ratio of the orders 1 : 3, or 1 : 5. Such transformers in themselves afforded useful gain, but for the most part were of relatively poor design resulting in poor quality reproduction.

With a typical general purpose triode valve, the stage gain increases rapidly as the plate load resistance is increased until this approaches a value of approximately five times the plate resistance of the valve. Increasing the load above this value then produces very little increase in stage gain.

When the plate load of a triode valve consists of the primary winding of an unloaded audio transformer, it is important that the inductive reactance of the valve at the lowest frequency, which it is desired to reproduce without serious attenuation.

For a typical general purpose triode, having a plate resistance of 10,000 ohms, the primary should have an effective inductance of not less than 20 henries. The average inductance of early transformers under working conditions was considerably less than this, and the brass correspondingly poor.

The inductance of a transformer (or choke) is dependent on three main factors:—

- (a) The number of primary turns.
- (b) The core material.
- (c) The amount of direct current flowing through the windings.

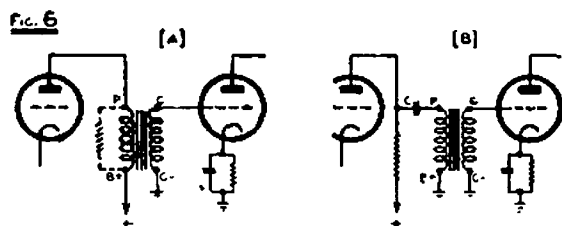
It is not practicable to continue indefinitely the addition of turns to the primary and secondary in order to obtain a higher primary inductance. As the number of turns is increased, the distributed capacitance across the windings also increases, and what is gained in bass response

is liable to be lost in high-frequency response, due to the added capacitance effects. In many modern transformers the windings are wound in separate sections and arranged in such a way as to minimise distributed capacitance.

The "Permeability" of the core material has also a marked effect on the inductance of a transformer, and is, therefore, also an important factor to be considered in the design.

When direct current flows through one of the windings, it produces a uni-directional magnetic flux in the core material, which reduces the effective primary inductance. The use of a butt joint, or air gap in the magnetic circuit minimises but does not obviate this effect. One well-known make of transformer has, in the absence of magnetising current, an inductance of 260 henries, which however falls to 80 henries at the full-rated primary current of 10 milliamps.

The plate current may be isolated from the primary windings by shunt-feeding the valve. Fig. 6 illustrates (A) the conventional, and (B) the shunt-feed method of connection. With the latter arrangement, the



operating conditions of the valve are quite different to those in the conventional circuit, and the output voltage available from the stage is much smaller. In cases where lower output voltages can be tolerated and the shunt-feed connection used, the resulting increased inductance usually enables better frequency response to be obtained. Under these conditions, the coupling condenser



W, VE, VK and ZL districts are to be considered separate countries when these awards are made. The only proviso to these awards is that a contestant score at least 400 points.

The two "N.Z. Centennial Cups" will be awarded as set out heretofore. These are two handsome silver

cups and winning one of them will be indeed a great achievement.

Each participant who forwards a log will receive a verification card of New Zealand's Centennial Celebrations and Souvenir of the 1939 VK-ZL Contest.

**SPECIMEN LOG SHEET.**

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Address .....

Transmitter ..... Input to final .....

Aerial ..... Receiver .....

Bands Worked ..... Number Countries Worked .....

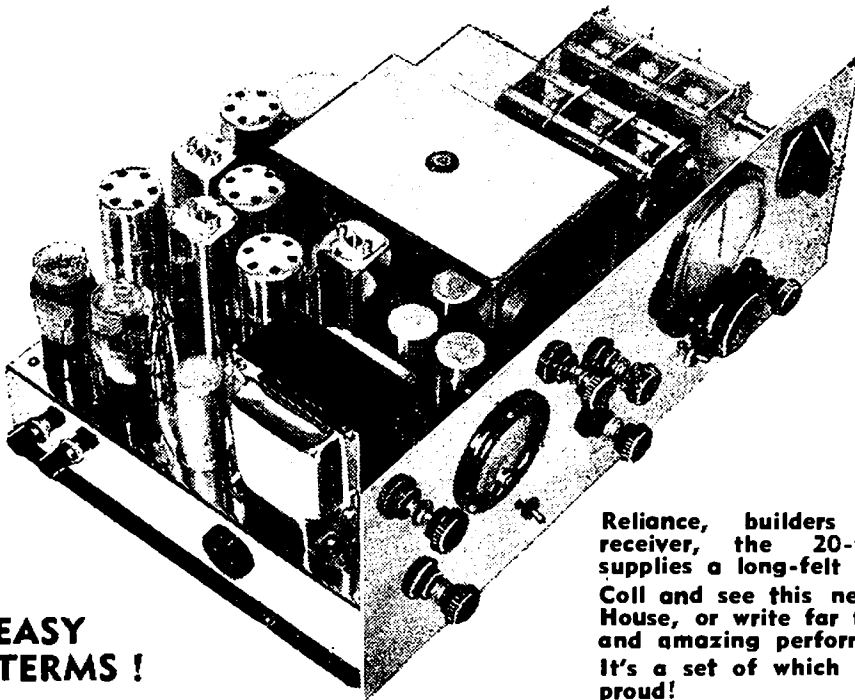
Date	Time (GMT)	Freq. Band	Station Worked	Serial Sent	Numbers Received	Contest Points	Cup Points

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## Federal and Victorian QSL Bureau

R. E. Jones, VK3RJ, Federal QSL Manager.

QSL's for Bulgaria should be sent care of HB9CE, Swiss Shortwave Radio, Zurich, Badenerstr, 68, Switzerland.

Harry White, VK3IR, has just returned from an interesting two months' trip to Malaya.

KH6KKR, situate in Samoa, has just got on the air with a T9 signal on 14350 KC.

The CW receiving contest, held at the August meeting of the Key Section of the Victorian Division, created great interest. Foremost in the speed section was VK3CX, whilst cypher at 25 w.p.m. was no trouble to VK3XS.

G2VZ, of Bexley, Kent, England, is desirous of VK contacts on 14 mc.

Another old timer to take unto himself a wife, is VK3BZ. All congrats and good hunting to you both, Morrie.

VK3GP awaits cards from two countries before submitting his application for membership in the DX Century Club.

VR4AD has been transferred to Ocean Island, and will shortly be on air under VR1 call. He promises to bring his VR4 QSL's up to date in due course.

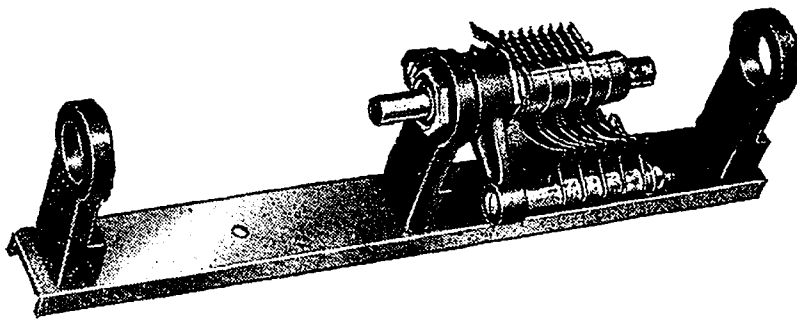
### DX NOTES FROM VK

Extract from "The Ohio State Journal"—

Our very good friend at VK3ME, Don Gilder, sent us some radio magazines from Australia, one of them being the ham's guide-book, "Amateur Radio," probably corresponding here in the United States to "QST." We're going to quote from the June, 1939, issue some interesting DX notes.

Foreign papers please copy. HI.

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## DX Notes

By VK3MR.

My humble contribution to last month's issue, unfortunately, was classified as "Too late for publication,"

Judging by the enquiries received, it is gratifying to know that somebody at least looks over the headings, and to all my fans, I thank you: both of you!

Conditions during the winter have been very poor and more than lived up to its reputation of being a dull period for dx, but there are noticeable signs of improvement, and should be up to scratch for the big battle during October. During the evenings, quite a few of the VS7, VQ8 and VU gang are coming through, which is a good sign, although there seems to be a complete absence of any signals after 11 p.m. on 20 mx, and much the same for 40. This band is not what it used to be, way back in '32! 7 mc was the only band used for the ARRL test, and 14 mc was a complete wash out except when the G's came through sometimes about 10 p.m., and lasted on rare occasions, for 2 hours, and during the afternoons there were no sign of any W's. What a treat. Those were the daze! An interesting QSO between VK3QZ and K7GOR (7005 kc) about 9 p.m. disclosed some very interesting things, one to the effect that the K7 had to use iron cored copper wire for his antenna as the ice formed up to an inch thick! Graham has now worked nine countries, and has only 60 more to catch up to his only rival, 3BM, who is now on CW. Believe it or not!

W6RJJ ex 4JP used a portable 800 watt rig fone and cw. Ed keys with one hand and devours hamburgers from the other, which has a tendency to make his fist less qsa. He wants to sell his neighbors vacuum cleaner cheap! 3VU is back from VK5 after painting the town red, and is trying to burn up my RF tube with a pair of T40's in PP. I have a special receiver tuned to his frequency, using diode rectifier which feeds the resultant dc, hum and all, into a spare

2 mike 5000-V. condenser, same to returned at a later date when the opportunity arrives. I am sure Jack would like to handle such a condenser.

DASD CONTEST. This years test is not enjoying the popularity of previous years and conditions are very patchy. The general type of European note is verging on Near DC and only a few real T9's can be heard. The G's, well known in the past for their extra pure signals, have now taken a leaf from the rock crushers in the States, but fortunately they use low power. I'm sure Uncle Tom will have a headache. Conditions during the third week were very poor and seemed to come up for a few minutes and go off again. I spent from 3 a.m. to 8 a.m. calling solid without a single contact, although I could hear every country in Europe. 'Tis one of the penalties of having a good receiver, or is it a poor ant? I usually can work what I hear . . . sometimes . . . During Sunday afternoon from 3 to 6 conditions were fair, but not a sign of any D's, only the usual Europeans, with a few extra LY's. There will be some QTC's exchanged before the test is over. After wasting KW's at the high frequency end, I tuned down amongst the fone hash, and heard a G on fone giving VK2KS an R7 report! Later, 6.30 local time, the ZL's started to work them, and as far as I could gather, no VK3's had any luck. No out band operation was noticed this year. Which reminds me of a well-known American receiver manufacturer who advises all and sundry, that their receivers will cover those rare few Kc's above 14,400 kc, where foreign stations work. Let me have some of the best scorers for this test by the 16th. VK2ADE seems to be going flat out as usual and working plenty. 3DP and 3JE are the most consistantly called Victorian stations and 3VF had his share Sunday afternoon after a fruitless early morn session. Best of luck in the October contest gang. 73's. Three Emma R.

## Divisional Notes

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceding publication.

### N.S.W. Division.

President: H. F. PETERSON (VK2HP)

Vice-Presidents:

F. A. CARRUTHERS (VK2PF).

W. G. RYAN (VK2TI).

Secretary: C. T. HORNE (VK2AIK).

Treasurer: H. D. ACKLING (VK2PX).

Notes Editor for this Division:

J. H. FRASER (VK2AFJ).

KEEP THESE DATES FREE.

Thursday, September 7th—Mr. Ross Trehearne, on "Some Interesting Phases of U.H.F. Work."

Saturday & Sunday, September 9th & 10th—Northern Convention at Newcastle. See separate paragraph

Thursday, September 21st.—General Meeting.

Thursday, October 5th.—U.H.F. Meeting.

And some time in November—The ANNUAL DINNER. Full details next issue.

### JULY GENERAL MEETING.

A lecture by Mr. Don Connolly had been arranged for this meeting. As he was unable to attend, Mr. Harold Ackling, VK2PX, who is an instructor under the Air Raids Precautions scheme, lectured on "Gas." The president was in the chair, and welcomed a few visitors, including a Mr. Backus, from the U.S.A., who has friends on the air over there.

Mr. W. Moore moved a vote of thanks to Mr. Ackling, and passed the opinion that although the lecture had been something out of the ordinary from the W.I.A. point of view, it had nevertheless been quite interesting and instructive. Mr. Goyen supported Mr. Moore and said that the lecturer was to be complimented on giving such a fine lecture at such short notice. The meeting closed at 10.30 p.m.

### AUGUST U.H.F. MEETING.

The third meeting of the U.H.F. Section of this division was held on August 3rd. The president, Mr. D. B. Knock was in the chair. Eighteen members and two visitors, Messrs. Zech (2ACP), and Wilson, were present.

A letter from ZL4HM, operator on the Union Coy's. S. S. Kairanga, was received, offering to co-operate with the section in any forthcoming sea-going tests on 56mc between VK and ZL. This matter will be taken up in the summer.

2TI reminded those present that they could come to the General Meetings of the Institute, as they were really members of that body of which the U.H.F. was a special department.

A suggestion was made by Mr. W. Moore and dealt with the need for the establishment of a relay chain of 56mc stations covering an area from Newcastle to Wollongong. Experience shows that such a chain would be a practical possibility if stations will co-operate, and the chain could be extended much further, taking in the Blue Mountains, Bathurst, Orange and Singleton.

In view of the success in relays on 56mc transmissions recently undertaken by 2NO and 2IQ, it was decided to communicate with Victorian U.H.F. Section, suggesting by the use of 80 or 40 metres, round table conference could be arranged between the two States, with two key stations relaying local 56 mc. transmissions. Such communication would arouse considerable interest for U.H.F. men and observers on the other bands.

The weekly roster of Sydney 56mc stations for nightly transmissions is maintained with the exception that 2NO and 2VN have changed nights, thus 2NO will be operating on a Tuesday and 2VN on a Wednesday night.

The important business of the evening was a lecture by the guest speaker, Mr. E. Fanker, 2HS. Mr. Fanker has written a paper on his lecture, which is to be published shortly. The lecturer complimented the W.I.A. on re-organising the U.H.F. Section, and would add that there is unlimited opportunity in the five metre band for local contacts. He also said that population of this band is everything and by using it for local contacts, much would be done to help the experimenter along.

"Finally there is unlimited scope for experimenting with beam antennae on this band, especially is there scope for learning the fundamental principles of all types of antennae because of their small size and relatively small cost."

Judging by the amount of discussion afterwards it would appear that Mr. Fanker raised quite a few interesting points. Most of those present entered into the discussion, and Mr. W. Moore (2HZ), moved a vote of thanks, which Mr. Trehearne (2IQ) supported. Both thanked Mr. Fanker for coming along and said that he had cleared up quite a few points for them. The meeting closed at 10.30 p.m.

### FROM THE ZONE EDITOR.

September is going to be a busy month for most of us. The all band contest will take place towards the end of the month, and the rules were published in full in August "A.R." Even if you can operate on only one band ("One man band"), join in the fun and give the other chap a cypher. VK2 should win the trophy this

year, with a bit of luck. Also I would like to see some VK9 chaps in the test on some bands at least.

I commend the advertisers to your consideration. Remember they help the magazine along, and those that have advertised this month should fill your every requirement. Don't forget to mention, "Amateur Radio," when you write to them, and if you are a regular customer, well tell them that you saw their ad. in the magazine.

For the American WAS aspirants, W6KWA told me in a very recent QSO that he will be operating portable in Nevada during the first and second weeks of September. He is going on a six weeks holiday (they call it vacation) and will be on a ranch in Nevada for ten days.

W6QQL, Nevada is quite active just lately again. He QSL's OK, for I have his card. So does W3DUK in Delaware.

I would remind those who contribute notes, that I must have them by the 12th of the month. No notes received from Manly or Lakemba Clubs this month.

2TF seems to be doing quite well in the D.J.D.C. Conditions were quite good on the first week-end, but did not seem so good during the second week-end.

2CP was getting ready for the VK-ZL 80mx phone test early this month only to discover that it was all over. Wake-up Ormie, if you were to read A.R. you would have saved yourself all the trouble.

Many old timers are back on 80mx, amongst some old ones are 2HC, 2NO, 2CI and 2VU.

2NO reports having heard a very fine signal from 2ACU on 5mx the other Sunday night. Keep up the good work, Ken and Harry.

Very interesting duplex transmissions are taking place on 5mx and 80 mx at 2IQ's place and also at 2NO's. Don transmits on 5 mx, Ross picks him up and rebroadcasts him on 80 mx, and Don listens for QSO's on 80 mx. The other night the reverse was done on 5mx in ZL, and Don had a duplex talk with a guy on 5mx over there. For the chap who likes something out of the ordinary, that's something for him to engage his attention with. 73 Jack

**NORTHERN CONVENTION.**

The Northern Convention of the Institute will take place on the week-end, September 9th and 10th. Hams from all over Newcastle and Districts will be there. The Saturday will be taken up with a dinner and business session, while on the Sunday there will be a real old style Hamfest and competitions are being organised. Prizes to the value of twenty-five guineas have been donated.

The Committee, which consists of 2KB, 2ZC, 2CS, 2YL, and 2KZ, are working hard. Any information re various expenses, etc., may be had from 2ZC and 2KZ, in the coalfields, and 2YL will provide any information for the Newcastle boys. Any Sydney Ham will be very welcome and will be assured of spending a most enjoyable week-end. Those interested should ring 2TI (FX 3305), or get in touch with Bill Moore as soon as possible. Transport is being arranged for those who get in early. It is reliably stated that the maximum cost of the whole week-end will be not more than 30/-, and this includes paying one's own travelling expenses and overnight board.

Roll up boys and don't forget the prizes. Drive up on the Sunday if you can't make it for the whole week-end. We will be meeting at Toronto at noon.

**"SWITCH TO SAFETY."**

A series of three instructional lectures on "Resuscitation from Electrical Shock," has been arranged by this Division. Our worthy friend, Mr. Harold Ackling, VK2PX has kindly consented to take charge of these classes.

The lecture precedes the Monthly General Meeting. The first class was held on August 17th, and the next one will be on September 21st. All those interested are requested to be in attendance by 7.40 p.m. on the nights of the classes.

If the support to the initial classes warrants it they will be continued for a further term. Now this is an important subject, hams, so roll up and bring any visitors who may be interested.

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**OFFICIAL BROADCASTS.**

This Division's Official Broadcasting Station (VK2W1), transmits every Sunday at 1100 E.S.T. on 7180 to 7200 kc. The latest news on the activities of the Division as well as general news is broadcast. The transmission is rebroadcast on 56mc. by 2IQ. Attempts are also made to relay the transmission of other bands depending on prevailing conditions. Reports on the reception of these stations would be very welcome to all concerned, and a card sent to P.O. Box 1734 JJ, Sydney, will be passed on to the parties concerned, and acknowledged in the usual way. However, all stations concerned stand by for QSO's afterwards, so stand by for them, and the official stations will elaborate on any points that may not be quite clear.

**COALFIELDS AND DISTRICT.****2KZ REGISTRAR.**

2YO has just completed lining his shack to make things a bit more comfortable. Is exclusively on 14mc. now, but is building a 3.5 mc rig. XYL and himself will be at the Convention. 2XT is heard occasionally on 20mx., but has not erected a decent antenna yet. I would like to hear from 2KE, and hear you on the air again. I hope you will be at the Convention along with the XYL. 2KZ is quite active on 20mc. and has phone going after ten years of CW. Is kept busy at the moment handling news along with 2YL re the Convention. The XYL will be there. So will 2DG and his XYL. 2DG is busy rebuilding the following line up: 42 807, 808; plus some phone gear, which looks very nice in a rack and panel. 2YL is up to his neck in it, erecting beam antennas, as well rebuilding to the following tune 6L6, 807, 809. His phone has nice quality. Will he be at the Convention? I ask you. 2PZ and the XYL are off to the Convention, which is rapidly becoming the topic of the day. He is always very pleased to see any of the boys. 2CW is on 40mx now but unfortunately will not be able to get down to the convention. Bad luck OM, but I hope to see you soon. All I know about 2CX and 2ACC is that they are both going to Newcastle for the Convention. They paid for their tickets one month in advance. I'll bet they are looking forward to meeting the W.I.A. boys. I guess 2XQ has a new rock because I heard him on 14000kc one day.

The convention is being held at Newcastle, and there will be approximately 15 hams from the coalfields there, but see a separate article for full details. I almost forgot to tell you that 2XT will be there also. So till the 9th, 73 Max.

**ALBURY DISTRICT.****2IG Registrar.**

Conditions are certainly a variable factor at present down here and most bands are pretty dead for about 18 hours a day

2OJ still on fone on two bands but has trouble with filament transformers. 2EU pounds out on forty like a ton of bricks and reports an HK on fone there. Hasn't raised him yet tho. Here's hoping, Arty. 2JA too busy with service work but threatens to get on the air before long. 2AP blew the dust off the rx and was surprised to hear the W fones coming in well. That means Arthur won't be long off now.

2VK, 2QE and 2QD are the silent key men, almost too busy doing nothing. 2IG is pleased at working G15WD on 20m for BERTA, but not much DX about. A new arrival to Albury is Eric Martin, late of Euston and hopes to have the rig going soon. 2OE is reasonably busy on all bands and raises some stray DX on both fone and CW.

2DO—Believe he is on twenty, but no news. 2ALS ex 2CW of about ten years ago, is back again and is only using about 4 watts, but getting some good reports at that. Welcome back OM

2AKE is making a few changes and should have some fone going by now. Gets over to ZL on 80m with 2 watts. Very fine work, Jim. I want to thank 2AKE for his information, and I hope that some of the other hams will get busy too. Now, come on fellows, what about it? 73 Reg.

**WAVERLEY RADIO CLUB, 2BV.**

These winter nights one would expect attendance to fall off, but to the contrary, during the last month, members including several new ones, could have been seen emerging from mufflers and coats and fighting for the spot nearest the radiator. During the month a "Junk" sale ("Junk" in name only), was held. The unsought position of auctioneer fell on to the shoulders of Leo Walters and such was his persuasive power that the pile of valves, etc., was soon transferred from him to the members, their cash travelling in the opposite direction.

The following Tuesday, Jack Howes, 2ABS, enlightened us on the intricacies of Ohm's Law and gave us model answers to questions from old A.O.P.C. Papers. We hear that more are to follow.

The remaining meeting nights were spent in discussing the details of the field day which was held at National Park on July 30th. Blessed with such a perfect day it couldn't have been other than a success. 2BV with its usual power, received an R8 report from 2YL at Cessnock and also contacted 2AFZ and 2TN the other two transmitters on the field.

2AFZ located at the cliffs overlooking Garie Bay, worked a station 400 miles away. This was hardly to be wondered at, because the sigs. started from such an advantageous elevation.

In conclusion, a warm welcome is extended to anyone interested in radio to visit the clubrooms, at the rear of 13 Macpherson Street, Waverley, on any Tuesday night.

## Victorian Division.

### KEY SECTION NOTES. BY VK3CX.

FLASH! FLASH! No, it's not a war—'twas the opening of proceedings at the August K.P.S. meeting, when a photographer, unable to restrain his desire for beautiful subjects, attended and took two photographs of the gang. QW in the chair, opened the meeting with praise for the new mag., and I'm sure the printer's ears were burning as everybody was greatly in favour of it.

The event of the evening then followed, when the lads' minds all went back to their early struggles with code. RJ had rigged up an automatic sender and gave the lads a chance to show their abilities on speeds ranging from 15 to 40 words per., but most dropped out when 20 was reached. All enjoyed themselves, even if it was only by watching the look on the faces of some phone members present. Highlight of the night was the whoop of joy from KN when he succeeded in copying three whole words at 20 per. KN had brought along an HQ120 receiver to demonstrate but by the time we got around to it some twerp had locked the door of the TX room and we had no AC to run it and had to content ourselves with looking at it.

Warning: Dont build a rotary—IG is suffering from a stiff neck as a result of watching his on a 90ft. tower.

BQ, however, is going ahead with a close spaced 6 element beam and in his spare time makes 1600 kc. I.Fs.

XM has a marvellous rig—he hasn't been on the air for 2 months and yet he got a note from the R.I. He even hears strange noises in his own BC set, so here's a chance for some amateur detectives to gain fame. RN can give them a job too, as he has lost his grid-drive, funder please return, usual reward. Talking of being off the air, look who's back—KN, working 14mc. phone, after an absence of 5½ years. His phone sounded better than a lot of those who had been on for years.

The air round Caulfield has always been thick and when RX recently moved there the gang threatened to drown him if he went on the air. When last seen Cedric was taking swimming lessons and warming up his pair of 199's. He was heard to orate, "Huh, I'll moider dose guys, I'll mow 'em down." The activity of WL has effectively silenced RJ as WL is only 20 yards away. Ray has been forced to sneak

in QSOs when WL is not home. CX sends deepest sympathy as he has UE next door and TV situated 150 yards away. Wow!

The Woolworths gang (5 and 10 to the uninitiated), are still active, JO, DA and ZU keeping 5 alive and CP, CZ, YP, and BQ making lots of noise on 10 but not enough to keep IK charmed. He has plug-in coils for 5 bands and tries to work them all, but by the time he has changed all his coils he hasn't enough time to spare for a QSO. IW and CX had a long yarn with 5AB in Darwin—their best DX for the month, and speaking of strange localities, QK will be on the air in October with a portable rig at Churchill Island—there's no need to get out your Atlas, it's in Westernport Bay.

Divisional Treasurer NY is busy chasing subs but Key Secretary UM spends most of his time these nights sitting over the fire, saving his strength for the All-band contest. WJ complains of the lack of DX on 7mc. and all the gang on 14mc. do the same in regard to that band.

### PHONE SECTION.

By J. C. KERLEY.

Next Section Meeting.—Tues. 26th Sept. Chairman—Ivor Morgan (3DH).

Hon. Secretary—J. C. Kerley.

Hon. Asst. Sec.—H. Simmonds.

Another year began for this section on the 25th July when we held our Annual Meeting in conjunction with the Annual Meeting of the Victorian Division of the Institute. I think that the idea of holding the Division's Annual Meeting on the same night as that of one of the sections, is one which should be adhered to, as it means a much greater attendance at the meeting and therefore more interest taken in the Institute's general business. The attendance this year was the largest that I have seen.

Our office-bearers for the ensuing year are at the head of these notes. All positions were contested keenly with the exception of "office boy," which was taken by 3LN unopposed. The Allocations Committee remains as before, and consists of myself as Chairman with A. Smith (3UX), T. Dinan, and A. Timmins.

3EN has been putting out an excellent phone sig. recently and was heard on a Sunday not long past working with 3BN and PC.

A suggestion to those who work two or more way phone is that all should use the same frequency, and thereby leave more room on the band. E.C.O. should solve the problem.

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The "Three Musketeers," Ted, Ivor, and Howard, of 3VM, 3DH, and 3KU, respectively were heard in a fourway with "Molly" WLOM recently. Which reminds me. Has anyone heard Ivor's record yet? If not, get on to WIOM anytime now and you probably will. Who said the 200m. band was the publicity band? I'll back 20m. after the other Sunday when the above mentioned record was discussed.

Now I have a grouch. Why do certain SW phone stations, notably VK2s, tend to run a mothercraft session or send greetings by juveniles over the air? Have been listening to a three letter VK2 and hearing how to feed a four months old baby on a bottle, whilst another had a very juvenile voice sending greetings to Auntie Vi. I can get all mothercraft and greetings from the BC stations, so why duplicate the service? If that is all you can discuss, QRT and clear the band a little so that someone else can have a go.

It is rumoured that the recent change in frequency of 7UV was due to 3LN's sigs. So you even get across to Tassie Len. It also means that the heterodyne on your Sunday xmissions has gone.

As Chairman of the Allocations Committee yours truly has gone all high fidelity. Am about to invest in an Oscilloscope. Now gang, watch your transmissions, as I am liable to run amuck with the above. If you want to blame anyone for it, have a shot at 3VM.

## U.H.F. SECTION NOTES.

By 3JO.

At the time of writing, no details of the results of the competition held on Sunday, August 27th, are to hand, but, as many hams have shown a keen interest in the rules, it is expected to prove successful. If the attendance at the August meeting can be taken as a guide, all intending competitors with one exception, are very busy putting their gear in order and thinking out their various reasons for 56 mc. being more popular. Too busy, in fact, to spare one night to meet their fellow hams and discuss their experiments and gear, etc.

Under the circumstances, it was not possible to make arrangements for co-operation with the VK2 U.H.F. Section as suggested in a letter from that division, and consideration of this must now be held over until the September meeting on Tuesday, 19th.

In Melbourne, 3DA, 3RI, 3CG, 3LG, 3YL, 3YJ and 3JO are doing their bit to keep the band alive, but improvements in some form or another are still required to almost every one of these stations before best results can be had. To date, 3LT has heard 3DA and contacted 3JO, while 3BH has contacted 3LT and 3JO. Signals have been weak and tone modulation has been necessary in all cases to get through.

## EASTERN ZONE NOTES

3DG-VG.

3DI—Active on 40 mx, when not qrl, yl and service work, what about putting in an appearance on 80 mx for the zone hook-up Jim? 3HT.—Dud heard trying to

get rid of "um" in a modulator unit. Are you sure Bert does not know where the trouble is, Dud, and is laying quiet, seeing you have broken that gentleman's agreement on the fone? Look out when you collect your next lot of qsl's. 3HK.—Keith putting out a fine signal on 80. Been trying a noise suppressor that really works. You had better let the mag have the dope, Keith OM. 3IC, 3SS, 3XH—All been having lots of fun with portables. 3WE.—Bill has gone into temporary retirement—strain of VK-ZL fone contest must have been too much for him. 3IL.—Active on 40 mx so we hear, using grp 2 watts to a 19. 3VG.—Getting a little dx on 20 mx W's VE, K6, and a F that's just a start, bigger things are to come. 3PR.—Ron on the go with his big vibrator unit but still has to cut down its purr a bit, quality much improved since installation of xtal mike.

3IG.—Last month we reported George as having worked a few more countries than he actually had, sorry om but you will surely soon make that score with the rotary perking as it is. Has replaced T20 with an 809 with better efficiency. 3PG.—Heard that help was urgently needed to hoist another of those things that turn around in the air and stand on a tower, not a rotary by ny chance, Bert. Is it right your tower is 100 feet high, Bert? As for 3GO, LY, QB, EA, XZ, HZ, JZ, will have to hold a memorial service for those chaps as they are very quiet, come on fellows, let's know if you are doing anything.

Seeing the cat is out of the bag we may as well tell you that the Eastern Zone now has a YL with a call 3KS and she comes from Buchan, so chaps, be sure and keep an ear open for her, that latter request, no doubt, was not required if we know some of the gang.

## WESTERN ZONE

VK3HG.

3GC.—Dick has started up in business in Camperdown. Good luck OM. 3II.—Erected two V beams and pleased with the results. On quite a lot on both 3.5 and 7 mc. 3JA.—Not heard lately. Must be rebuilding the receiver. 3KX.—settled in new QTH and working a few on 14 mc. 3SZ.—Stan has had a spot of BCL trouble on 3.5 and so is missing out on the Bone hookup. Active on 7 mc. 3TW.—on 3.5 and so is missing out on the zone morning, but mainly on 7 mc. 3WT.—Now located in Whlttington and has at long last raised that elusive DX. 3WW.—Heard and called one night on 3.5 mc. but he could not have had any receiver as he could not be raised. 3XC.—One of the regulars on Sunday morning Schedules and getting some DX on 14 mc too. 3OW.—Improved his V beams and getting some nice DX on 14 mc phone. 3HC.—Having trouble to get the new antenna system working satisfactorily. Still requires three countries for the century but cannot raise them, although hearing plenty.

Plans for our second convention are under way. Tentative date is third week-end in November, and the present indications point to Camperdown as being the most suitable town.



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## Queensland Division.

The August meeting, held at the usual rendezvous in George St., City, was attended by a fair number of the gang. A visitor present was Mr. McLeod, VK2ADC, ex 3ZZ, who happened to be visiting Brisbane in H.M.A.S. Swan. We had the pleasure of listening to a very well presented lecture by Mr. K. Price, 4KF, who chose for his subject, "DC Motors." Refreshments were provided after the meeting, this being quite a unique event, but one which proved popular.

About 30 hams visited the Courier Mail and broadcasting station, 4BK, and saw the production of a modern news-and broadcasting station, 4BK, and saw paper from start to finish. The speed with which a complete newspaper is printed, folded, etc., was a source of amazement to most of those present.

The 56 mc gang have a ragchew across town each Sunday night, and incidentally if any of the local gang have 5 metre gear and are keeping the fact dark, please put the boys wise as a station was heard on CW calling "CK 5 metres." Unfortunately, the call sign was not heard and speculation was wide and varied concerning the identity of this station. The time was approximately 9.10 p.m. 4HR has built up the "2JU" 5 metre converter and its success is such that several other hams intend giving it a tryout. An amusing incident occurred on a recent Sunday morning when a few of the boys were trying out portable gear on a local hilltop. Despite all the operators' attempts the RF could not be induced into the skywire until a few of the local small fry were cleared off. We worked out that the absorption was about 2 watts per boy—hi!

Mr. Thorley, 4RT, who has very efficiently filled the position of secretary for the Queensland Division for the past two years, has reluctantly been forced to relinquish the post, for business and family reasons. Mr. MacGregor, 4ZU was elected as Secretary, and if the support afforded John continues the Institute should continue to forge ahead.

## PERSONAL PARS.

4GG, of Chinchilla, been transferred to Innisfail. George has been known as the "Old Iron Horse," in ham radio for years and had given it wide publicity in his home town.

4RT.—We should see John a little more active now that he's no longer secretary

4RY.—Bill mainly on 56 mc., but doing a little on the other bands. Landed that 100th country yet Bill?

4AX.—way up in Cairns, heard occasionally.

4UR.—Maintaining his reputation as No. 1 CW DX man in VK4. Also very pleased about a few more cards recently received.

4UU.—Bill not very active but fills the position of treasurer very well and also is QSL manager.

4ES.—Late of Bundaberg, concentrating on 40 mx at the moment. Contemplating a new super and as the present one has 10 tubes the next one should be worth having.

4DY.—Eric has some nice gear, but doesn't find the time to get on the air much. Also runs the library.

4FJ.—Roy very gratified at the response from the zone managers, but would like to see more yet.

4EL.—Now has 114 countries, 97 of which are verified. Looks like another VK for the century club.

4FN.—Been transferred to 4RK, Rockhampton Congratulations, Frank.

4FL.—Worked HK5EA on 40 mx. fone, got an R7 report too. Nice work, Frank.

4OK.—Using 6v6g tritet with about 4 watts from a genemotor. Use a Jones M.I. antenna and work dx like a QRO merchant.

4RF.—Heard on 20 mx using series modulated fone. Uses 616g final and a 45 as modulator

4NO.—Norm has changed his QTH to Chartres Towers.

4UX.—Claude quite settled down in Bundaberg.

4SN.—Spending holidays in Brisbane and visiting a few local shacks.

# RADIOKES

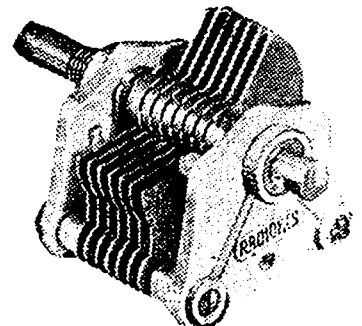
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## South Australian Division.

By VK5RN.

A council meeting was held on August the 2nd., when still more membership applications were dealt with. On Wednesday, August 16th, a general meeting is being held, when Mr. Frank O'Grady will give a lecture on modulation. This is a very popular subject, and a large attendance is expected. Judging by the crowd at last month's meeting, the new system of having lectures, and not discussing business at general meetings is working most successfully.

With summer approaching conditions have been improving on the higher frequencies during the evenings, 40 metres has been far more alive and occasionally 20 metres has provided thrills in the way of DX, but both bands have been very erratic here, although during the afternoons Europeans have been plentiful.

On the other hand 80 metres has been very reliable and is usually full of VK and ZL fone in the evenings, especially on Sundays. At 10.30 a.m. on Sunday evenings a few locals get together on this band and have a multi-way QSO, when it's not too cold for them, so what about joining in?—especially country hams.

The 80 mx fone contest is now over, and it appears to have been very successful, so if you haven't already sent in your log, don't delay.

I must confess that I know nothing about 5 metres or 10 metres, as I haven't a receiver for these bands yet, but I believe that 5 metres has been very quiet indeed, so why not use this band more for local contacts as stabilised oscillators are cheap and easy to build, and it would relieve some of the QRM on 40 metres on Sunday mornings and give some of the lower powered country hams a chance to make their signals heard in the city.

For the benefit of those who didn't hear 5FM's Country Session on Sunday, 13th August. Would all zone officers who are members of the new society please continue in their old capacity, if they wish to do so, because they are best fitted for the job, having had so much previous experience.

After September 1st we are going to have trouble in the 7200-7300 kc. region of our 40 metre band, from European commercial stations, so those who have an E.C. oscillator or a crystal in this section of the band are urged to occupy this valuable range of frequencies.

A rare country. — Amateur radio has restarted in Spain, as EA7BA is audible here about 6 00 p.m. S.A. time, and puts in a nice signal on the L.F. end of the 20 metre band on fone and some of the local chaps have contacted him, it is reported that he QSL's. His address is in all old call books.

Members are reminded that the institute will handle QSL cards for a halfpenny a card, and if you are a dx hound this fact alone will save you more than your subscriptions cost you in a year, so don't fail to use this service, and if you are not a member of the Institute don't hesitate to join up and you will find it well worth while.

## Western Australian Division

By VK6WZ.

Division meets on second Tuesday each month at 8 p.m.

August meeting was one of good attendance with host 6BB and deputy 6RU well to the fore. 6MM (now in the city and hoping to get on the air from Shenton Park), 6LS (a new full member), and 6IZ (ex 3IZ), were present and were welcomed in the approved fashion. Business included a letter from the Minister for Customs on the case for abolition of duties on communications type receivers imported for experimental work. It seems that the Australian radio industry would suffer a crushing blow were these receivers to be allowed in duty free. The Minister further pointed out that two Australian firms were prepared to make such sets if orders for ten or twelve were forthcoming. It's nice to know that the local industry is capable of swotting up in a few weeks what Eddystone, Hallicrafters, National RME and others have taken years to learn! The meeting was informed that one Perth firm has called the bluff and ordered a batch of receivers on condition they are up to overseas standard.

Field day committee advised that they plan a field day for the third Sunday in each month. U.H.F. section put forward suggestions among which was one for a home QSO day for five-metre cw. This move should stir up the completion of receivers capable of copying telegraphy on that band.

A move is to be made for the formation of an emergency network in VK6. Organisation is in the hands of traffic manager 6AF and he will welcome suggestions and offers of co-operation, particularly from country hams. The meeting closed and the evening wound up with an auction of surplus 6W1 gear at which bidding was good and 6W6, the auctioneer acquitted himself nobly.

The Division moves into new headquarters in C.M.L. Buildings, St. George's Tce., in time for the September meeting. All correspondence should continue to be sent to the private box as given on p. 1 of "A.R."

Undamped waves:—

6MW.—Has A.M.C in operation and it hardly seems to matter whether he talks to the mike or not—it still modulates fb.  
(Continued on page 36).

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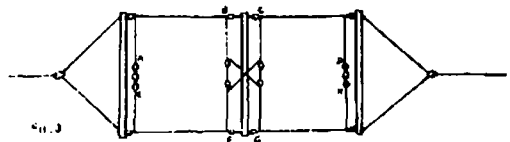
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## THE W8JK BEAM.

(Continued from page 17)

**A still shorter Array:** If there is no room for the array above described, it can be shortened by a few feet.

It should be borne in mind that the aerial proper starts from the points at which the feeders join it—that is, of course, if the wires are cut to the correct length for the frequency used.



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Still further shortening of the array can be achieved by turning in the ends of the wires without altering their length. Fig. 3 shows how it is done. As there is comparatively little radiation from the terminal parts of the aerial there will not be a very great sacrifice of efficiency.

(To be continued)

There is a young ham in Bengal,  
 Whose beam is no good at all,  
 When he turns it on here  
 His sigs disappear,  
 I guess his reflector's too small!

—6FL.

(Continued from page 33).

6GB.—Jack has made provision for A.M.C but so far no workee. 6CX.—Shares the forty metre band with neighbour 6KO. That's co-operation for yer! 6TM and 6RB also co-op. Eric has his fone going now and cathode modulates with a single 6F6—no speech amps—just a one-tube modulator. 6MM.—Heard from 6 Beery Wasps during the recent QSO day. Tell Milton's voice anywhere.

6FL.—Frank reports twenty metres on the improve in Geraldton 6LJ.—Sez he's getting back on the air. I wonder? 6AF.—Now has model of Chrysler building in shack. He calls it his rack. Small fortune in aluminium there, too. When do tenders close for installing that lift, Allan? 6BB.—Confessed his vast accumulation of junk had him worried when the National Register came around. 6GP.—Threatening big things with home-wound tranny. Give the powerhouse due warning before switching on, Clarrie. 6GL.—An oldtimer now on the air fairly often from Kojonup. Uses vibrator power and gets 450 volts out of it for his 6P6. Sez the vibe makes fb radiator under those condx 6RW.—Heard on 7mc. recently after long silence. Usual fine quality and good modulation. All from d.c. mains, too. 6LM.—Wiluna man who hopes have some fone working soon. Busy swotting up ways and means for cathode modulation. 6WZ.—Back on 7 mc. convinced that eighty mx. would be swell band if only somebody would get up there.

## TASMANIAN NOTES.

### NORTHERN ZONE by VK7LZ.

To begin with I must apologise for not sending in any notes for the July issue, but 'Old Man Flu' decided that it wasn't worth while. Conditions down here this winter were if possible, worse than last year and there has been very little activity on any of the bands. However, by the time these notes are printed, we will be all tuned up for the all-band VK CW contest. Our zone in this contest hopes to be more active than ever before with 7AB having a good try and as far as I know 7XL, 7KR, 7DS and myself will all be there trying our best to keep Tasmania on the map.

At least three of the above stations will be using the 1.75, 3.5, 7, 14, and 28 mc bands. Keep a good look-out for us chaps.

7CJ is now back on the air again after about three weeks' spell. What happened, Jack, been rebuilding? 7BQ.—At present putting the finishing touches to a lattice mast so'as to get a ten metre rotary beam in action. 7DS been trying in vain to get down on 20 metres for some time now. 7LC at Queenstown tells me he has no time for amateur radio at present as he is too busy keeping 7QT on the air 7XL—George still having trouble getting his antenna going on 20 but succeeds very well on 40 metres. 7AB.—Still keeping skeds with W6PMB every Sunday on ten metres. 7LZ.—Trying to find DX on 40 and 20 without much success. 7RK is now back on the air after a spell in hospital.

If any of the country members are ac-

tive I would very much like to hear of their activities so as to give them some space in these notes. In conclusion remember our next meeting at the Y.M.C.A. on the last Thursday of the month

## NEW GUINEA NOTES.

9WL.—Pleased to hear you have found the bug in the xmtr Laurie and the rig has made up its mind to perk on the one freq. By the time these notes are being read Laurie will probably be out on leave and chewing the rag with VK's in their home shacks. Half your luck old son. A new Howard receiver is to be here on his return.

9DK.—Still as hard after the dx as ever I can see Ernie and more power to you. Two new countries fell to the call in VP6 and VP7. The new rotary is well on the way.

9XX.—How's that 7 mc coil job progressing, Basil? Haven't heard you yet, but expect you are mowing the dx down. Let's hear from you.

9RM.—Had a letter from Peter and he is all set to go when he gets an antenna pole that will hold the Zepp up. Now has a bug so look out chaps for his 'H's' with six dits in em.

9CW.—Has at last staged a come-back and fb too George. We are jolly pleased to hear your cheerful voice again. The trouble was in the gen. and also in a transformer. The R9\*\* sig. you put in here on 40 is a credit to you oc. By the way, if any of your chaps are working Geo., and you hear at the end of each over a faint voice say, "Make im die," well that is just a New Guinea relay in operation. What is the starting up word. "Kerrup im." ??? hil

9BW.—I told you that Bill would be off the air for an indefinite period and knew at the time I should not have said it because I met him to-day and darned if he wasn't full of a new rig and modulator he was building.

9MC.—Still out on leave so nd from "Wewak Willie."

9KO.—A newcomer and don't know much about you yet but believe you have an eco rig.

9HB.—Just finished the rig to-day, but found the ant. would not take the "juice," so the sig won't hit the air till tomorrow. Good luck Harley and plenty dx to you.

9NB.—Will be on next week with the rotary firing shots in all directions and we have great hopes from this ham.

9RC.—Haven't heard from you for a long time Ron but heard you on 40 with a very nice signal a few weeks back. Hope to have a chat with you soon

9VG.—Not much doing as usual these days. Landed VP5PZ on fone and had a fine chat to him but haven't heard him since. Also worked XZ2JB for a new country. Condx are not so good yet but are changing rapidly. We can hear the J and XU chaps coming through very well now and the W's are very hard to have a good contact with. Did I tell you the tale of the European beam put up hr. Heard a few ONs, SM and Gs coming in so called "CQ" Europe and back came a W6 who wanted to know why I didn't put up a beam on U.S.A.

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### *Publishers.—*

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### *Editorial Department.—*

W. R. GRONOW (VK3WG),  
Editor.

R. H. CUNNINGHAM (VK3ML)  
Technical Editor.

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### *Advertising Department.—*

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129 William Street, Melbourne.  
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J. H. FRASER

McLaren Street, North Sydney.  
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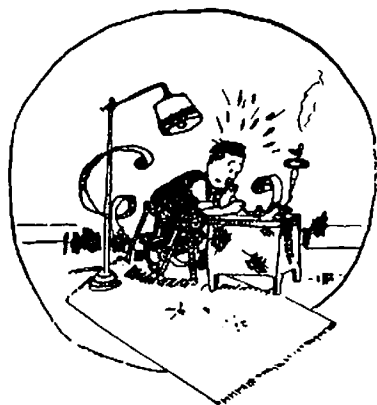
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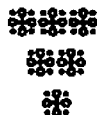
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## EDITORIAL



Wor—suspended experimental licences—silent transmitters! What conflicting emotions are set up by those words and all that they mean. September, 1939, will live in all our memories as a period that can never be forgotten. August, 1914, to so many of us has been merely "the beginning of the World War," it was to us a month of historical importance. But this month, September 1939, personally effects us all, our normal lives, our homes, our work and—our Hobby.

How often we have glibly spoken of the value of Amateur Radio as a huge training ground for operators who would be of value in time of war; of our R.A.A.F. Wireless Reserve, manned by Hams, voluntarily training themselves with their equipment to serve their Country should the need ever arise. The need HAS arisen, and with a feeling of unbounded pride, we write of the spontaneous response from the Australian Amateur. From one end of the country to the other, from cities and farms, the Hams have come to offer their Services to the Allied Cause. No light-hearted adventure this, but the grim business of War, for Patriotism must go more than skin deep for men to leave homes and good jobs, some of them one man businesses, and farms, to answer the call of Duty.

We are in this War to the bitter end, and only when victory is ours can we return to the doys now past. In the meantime, Amateur Radio has difficult problems to meet, the holding together effectively of our Wireless Institute, the

maintenance of contact with all members wherever they might be. Our Magazine takes on a greater significance as the sole means of keeping each of us in touch with the other. We hope to record month by month something of what the Hams of Australia, and of the Empire, are doing in the Cause of Freedom so that in the end we will have preserved for all time a record of the finest achievements in Amateur History.

Some members of the Magazine Committee have already been called up for Service, but as far as is practicable, all plans that have been formulated for the future will be carried on taking due regard to continuously changing conditions and circumstances.

To those, who for reasons of age or physical infirmity, cannot enlist, there is no need to feel disheartened over the immediate future of the Institute and our Hobby. Federal Headquarters and the Federal Council are actively at work endeavouring to see that every phase of our Institute's usefulness is placed at the disposal of the appropriate authorities. For A.R.P. and Red Cross work, for training W/T and D/F operators there are fields of service for everyone. In our Hobby itself, too, there are big opportunities in receiver, aerial and oscilloscope experimentation, to say nothing of the immense value lying in research into the more effective suppression of man made interference.

Our policy, individually as well as an Institute, must be to carry out in principle the Prime Minister's injunction to "CARRY ON."

## Reorganisation

---

### Our Work and Prospects for the Future

---

The Wirelss Institute of Australia has received many setbacks and problems in the past, but none more serious than the Departmental decision to cancel all Experimental Licenses during the continuance of hostilities.

What is our present attitude to the changed conditions now that we have had an opportunity to review the situation? Are we to quietly fold our hands and say as philosophically as possible, "Well the game's settled," or to face the future with a genuine conviction that such a problem is not unsurmountable, to a well organised and versatile group of enthusiasts. The dynamic quality needed by us all, if the Institute is to continue to function, is a determination to maintain our interest in Amateur Radio even though we are denied the pleasure of "getting on the air."

This interest can only be maintained if all the members assist their Divisional Councils to promote a progressive policy for the future. The time is now opportune for the formation in each State, of a section of our members, who will undertake to forward weekly or monthly reports of conditions on the short waves, say from 1500 KC to 56 MC, to their divisional secretary, or notes secretary for publication in "Amateur Radio."

The receipt of this information will not only enable us to continue to publish our magazine, but will assist us to attract the better type of Short Wave Listener to read "Amateur Radio," and probably join our rank, to be future hams in fact.

As soon as this monitoring organisation can be established, we can offer our assistance to the Secretary for Defence on a Federal basis, with a view to policing these bands, and at the same time keeping our members in touch with short wave con-

ditions generally.

There is now an excellent opportunity offering for us to develop experimental groups in each Division, to investigate receiving problems—short wave direction finding technique—56 MC receivers and beam aeriels for reception, etc. It would be a forward move if each Division could obtain a signal generator cathode ray oscilloscope and suitable apparatus to equip a testing and calibrating laboratory. There should be plenty of opportunity to develop group experimentation on receiving problems, and to extend our knowledge of general fundamentals with the assistance of such equipment. It seems likely that we will have to arrange more lectures at which demonstrations will be made, if our meetings are to be attractive.

Code classes and "ladders" will also make our section meetings more instructive and interesting. Federal Headquarters has already been in touch with the Post Master General's Department, and has suggested our ability to promote classes for radio operators, who would later be of great value to the various services, a practical avenue of service for the Institute to undertake.

Naturally, the situation is being watched very carefully, and no opportunity will be lost to bring the Institute's organisation to the attention and assistance of the proper authorities.

As soon as possible, we will endeavour to induce the Post Master General's Department to state their policy towards the Amateur, with reference to our status after the war is over.

Most Amateurs felt it keenly when they received a brief note explaining that after the expiration of their existing licences they would have to take out ordinary Broadcast Listeners' Licences.

Whilst this seems like rubbing it in, it is obvious that the Department cannot logically accept our present experimental licence fee, when we receive only the ordinary facilities obtained by the broadcast listener.

What seems most likely, however, is that we will obtain a reallocation of our call and licences after the war is over, provided that we are still able to satisfy the Department of our technical ability.

This is another important reason why we should seek to maintain our Institute, as we will need to possess an organisation to promote technical education, and also to place our unified requests before the Authorities for our reinstatement as Experimental Licencees.

Your magazine is the best medium for maintaining your interest in "Radio," and the Institute; we count on your continued support in this direction.

The Amateur has shown his qualities in no uncertain manner in the R.A.A.F. Wireless Reserve, Bush Fire and Flood Emergency Communications Networks, and will continue to meet his problems in that characteristic way which he has developed when facing difficulties such as confront us to-day.

W. R. GRONOW,  
Federal President, W.I.A.

#### RANDOM NOTES.

Eric W. Trebilcock (B.E.R.S.195), the world-famous S.W.L., who for two years held the B.E.R.U. Challenge S.W.L. Cup, has joined the ranks of the Hams, and is now VK5TK. His QTH was Tennant Creek, Northern Territory (400 miles north of Alice Springs) where he was senior telegraphist, but before the gear for his xmtr arrived, he hooked an aeradio job in the Civil Aviation Department.

His next QTH is uncertain, but will probably be one of the Islands; he delights in out-of-the-way places! If you contact him, don't be afraid to QRQ 35 w.p.m. won't worry him.

No, he is not a relative of VK3TL.



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# Receiver Design

By E. M. Fanker, M.I.R.E. (Aust.), VK2HS

Chief Engineer: Thom & Smith Ltd., Sydney

Receivers for the U. H. F. Bands may be divided into three major types, namely (1) the T. R. F. type, (2) the super-regenerative type, and (3) the superheterodyne type.

The T. R. F. type has been neglected on this band, but lends itself very suitably for U. H. F. work. However, suitable components must be used. The big disability is a supply of suitable tubes. The only types suitable are the **Acorn Series**, but it would seem that their high cost has been the reason for the T. R. F. type of receiver being neglected.

Coil design for this type of receiver is important, and maintaining stability becomes difficult. In addition, feed-back and interstage interaction increases in proportion to the increase in frequency. Selectivity is not yet a serious problem out here.

However, a T. R. F. is difficult to adapt for adding a noise silencer to, and such an addition is very necessary for U.H.F. work because of automobile interference.

The Super-regenerative receiver has the advantage of being simple to construct, requires very few tubes and parts, and has quite high sensitivity. Another feature is its inherent A.V.C. characteristic and ability to discriminate against automobile interference. However, it has the disability of having a high noise level, and is very broad in tuning.

Finally, there is the Superheterodyne receiver. It is the logical answer for the U.H. Frequencies as well as for other frequencies.

Construction of a **Superhet. Stage by Stage.**

1. The **Input Stage** is most important in this type of receiver, because it is here where the discrimination between receiver and signal noise takes place. The higher the gain before the frequency changing valve, the better the signal to noise ratio.

It is desirable to have a **R.F. Stage** before the frequency converter, and the first point that one must consider is the type of tube to use. Here again the **Acorn** is the most desirable type. The reason is because it has a very high input admittance, despite the fact that it has a lower mutual conductance than the 1851 series.

At low frequencies we have been accustomed not to worry about input admittance, because all it did was to add capacity to the circuit which usually did very little harm. However, at High Frequencies and U.H. Frequencies this is not the case. The input admittance is no longer very high, but quite low, and it decreases as the frequency is increased.

There are three main causes for this decrease in input resistance. Firstly, the inductance in leads (especially the cathode lead) causes the admittance to drop, and as the frequency increases so does degenera-

tion increase, and any degeneration will reduce the gain. Secondly, the **Electron Transit Time** reduces the input admittance, and at these high frequencies the electron transit time becomes quite appreciable. This is another factor which helps reduce the gain. Thirdly, the effect of **Capacity in the Tube** reduces the input admittance. It is more than apparent capacity given in the tube booklets, and depends on the quality of the tube base and socket, too.

Gain is directly related to the input admittance and the mutual conductance of a tube. An increase in one means a decrease in the other, thus one offsets the other. For these reasons the **Acorn** is the **Natural Choice**. However, if they are too expensive, then the next best thing is to choose a valve with as high a mutual conductance as possible, and get the gain from the tuned circuits.

In order to get selectivity, the ratio of inductance to capacity should not be high. However, in the **Radio Frequency** stages it is more important to get high gain, and this is only possible by using a **High Ratio L/C**. The selectivity may be got later on, by paying attention to the intermediate frequency stages of the receiver.

The following precautions should be observed. Leads must be short,

all stray capacities to ground should be minimised by mounting components on stand-off insulators wherever possible, and the grid connection should be tapped down on the coil to get a better impedance match.

The type of coupling in the antenna coil depends, of course, on the type of antenna. Short antennas may be capacity fed to the grid of the tube. However, if a low impedance antenna is used then it is best coupled to the secondary by two or three turns at the low potential end of that winding.

The type of R.F. Tube has already been discussed. The best **Type of Coupling** between the **R.F. Tube** and **First Detector** is achieved by interwinding the primary coil with the secondary and having about the same number of turns.

**2. The Frequency Converter or First Detector.** Here again the **Acorn Tube** is the most desirable tube, especially if no R.F. stage has been used. It is essential to have a **Quiet Tube** in this position. The main cause of noise arising in the converter stage of a superhet is the shot effect produced due to the plate current flowing in that tube. Therefore, the **Logical Choice** is a **Tube with High Mutual Conductance and Low Plate Current**. Television pentodes are very good in this stage

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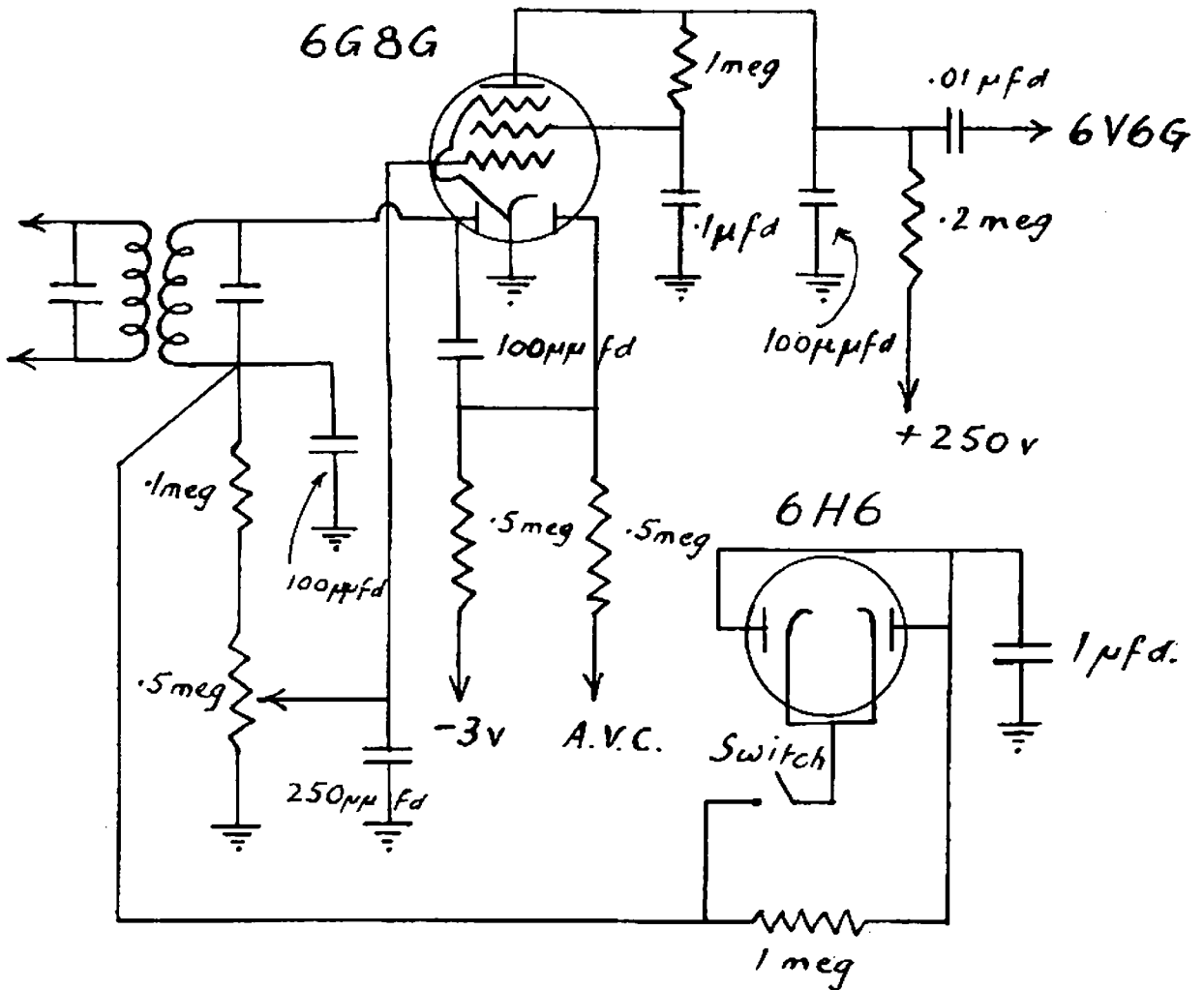
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of the receiver, especially if the valve is biased so that it operates with the same mutual conductance as an ordinary converter valve. Operating in this condition there will be an appreciable reduction in noise. The best way to introduce the oscillator

in conventional circuits. The 6J8 is more stable, but if all the advantages of this tube are to be gained, it is essential that the First I.F. Transformer be of a special type. The Primary must have a high inductance to capacity ratio so that the



THE "DICKETT" NOISE SILENCER.

voltage in this type of tube is to capacity couple the oscillator to the control grid of the converter tube.

Of the other types available the 6A7 seems the worst, because of the poor mutual conductance of the triode portion of the tube and also because of interlocking in the tube itself. The 6K8 behaves quite well

plate impedance of this tube, which is 4 megohms may be more nearly matched.

3. The Intermediate Frequency Stages. The first question is the choice of a suitable frequency. Originally it was the custom to use low frequencies. However, as the signal frequency is increased it is

increasingly difficult to get good image suppression. As this feature is most important in a receiver for the U.H. Frequencies, a comparatively high intermediate frequency is recommended for this style of receiver. In addition, the receiver is often called upon to receive unstable signals and extreme selectivity is not needed. An intermediate frequency of 3 mc would be admirable from an image interference point of view, but the gain from such I.F. Transformers is low. It would appear that 1600 KC is a good compromise, providing good gain and quite fair image suppression. In addition, 1600 KC seems to be a frequency that is clear of commercial services, so that there is very little chance of a signal riding straight through on the I.F. channel. In addition, good selectivity for the U.H.F. Bands is obtained using an I.F. of this frequency.

The maximum number of stages should be two. The set will be found to be too noisy if the gain is got from the I.F. Stages. The only reason to recommend two stages in such a receiver is that the set may be required to work on 14 mc and 7 mc, too. However, in order to get good results the maximum possible gain should be got from the R.F. stages, and the I.F. Stages used to obtain selectivity.

One stage of I.F. amplification should prove quite adequate. Special I.F. Transformers have been designed for this purpose and used with great success by 2NO. They have a very high L/C ratio, and the tuning capacity is only 15 mfd. The sensitivity in a conventional receiver using one stage of I.F. amplification at 1600 KC was 40 microvolts from the grid of the frequency changer.

Continued on page 28

# AEGIS

## QUALITY PARTS

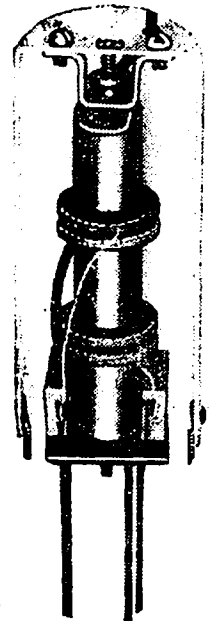
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# The Volunteer Coastal Patrol

By M. M. Lusby, VK2WN, VLH3.

(Editor's Note:—This article was contributed before the war and contained the sense of how the ham could assist in the defence of the country in peace time, and in the event of war. The Volunteer Coastal Patrol is a unit of Yachtsmen and amateur operators, whose activities are presented below. We have had to delete the opening paragraph owing to the change of front since the contribution was received, otherwise the story is as written by 2WN).

... the Yachtsmen showed us the way. They really conduct their hobby with the same motive as we do ours. They possess vessels and boat handling knowledge and spend their leisure hours enlarging their experience. Just like us with our Radio.

Messrs. H. W. G. Nobbs and W. Giles started the ball rolling, and under the guidance of Captain Maurice Blackwood, R.N. (Retired), Sydney's Yachtsmen were organised with their vessels, large and small, into divisions and flotillas.

The vessels were drilled in formation work, and special manoeuvres, communications being by flag hoists semaphore. They were very effective, too—in daylight, but not at night.

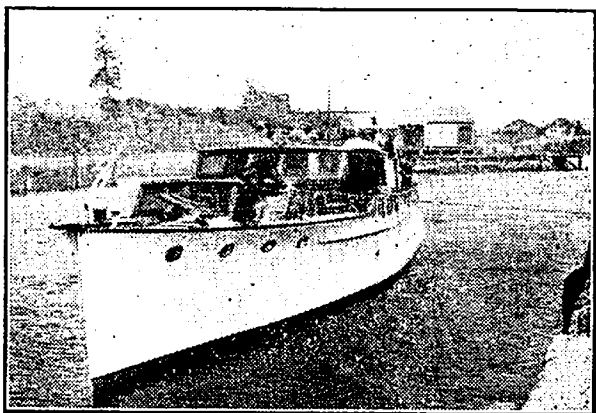
A fact brought home early in the piece was that patrol boats, such as these, would be of greatest value at night time, reporting enemy positions or mine sweeping, etc. That's where we came in—to assist in the communications at night.

The W.I.A., N.S.W. Division was approached by Mr. R. H. W. Power, a one-time secretary of the division, and now an Executive Officer of the V.C.P. A number of Hams joined up. Radio equipment and mast headlights were taken to sea a couple of weeks later. The experience showed how useful these forms of communication could be made. More Hams joined up, and we were subsequently granted special Licenses and Frequencies by the P.M.G.'s Department.

The call signs consist of the letters VLH followed by a single numeral. Two types of equipment were de-

veloped, the first an electron coupled MOPA, and the second a Crystal controlled two stage affair. Suppressor Grid Modulation is used.

The Yachtsmen have shown great aptitude in assimilating the Morse Code, and likewise we have been picking up much helpful dope on the running of boats, navigation, flags signals, etc., not to mention the lighter side of life on the Ocean Wave.



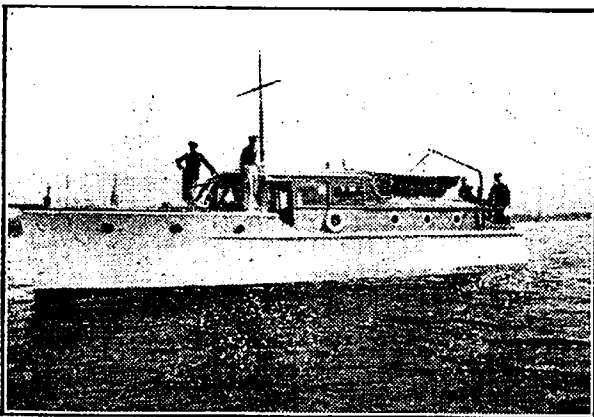
**M.Y. "Silver Cloud" bringing Military Officers back from Coastal Reconoitre—in Wollongong Harbour.**

A number of successful cruises have been conducted, Sydney to Wollongong and Broken Bay. We have co-operated with the army on several occasions, notably the Coastal Defence exercises of the 9th Brigade off Wollongong early this year.

On a recent occasion, the exercises were observed by Mr. Spender, M.H.R., who expressed keen appreciation at the efficiency and precision of the various movements. This in-

spection took place at Broken Bay, and followed all night exercises in the course of which an "Enemy Raider" was apprehended by one of the protective patrols. It was trying to "Run the Blockade," and blow up the Hawkesbury River Bridge.

Two day exercises are conducted over the week-end once every two months, and night or afternoon manoeuvres are held on intervening occasions. We have our own Rifle Club (optional), and our headquarters are now established at an ideal location—Snapper Island.



M.V. "Pelorus"

A moderate sized Cruiser.

Snapper Island is a Naval Training Depot, built by boys on a rock in Sydney Harbour. It required the blasting of 1000 tons of rock and reclaiming a vast area of sea bed. The workmanship displayed in the structure of the buildings is worthy of many skilled craftsmen. The boys

work under the expert guidance of Commander Forsythe, a retired Naval Officer. The main buildings occupy over 6000 square feet, and are formed along the lines of a Man o' War, with Bridge, look-out, main and quarter decks, etc.

Meetings are held on alternate Monday nights, and we are transported across the water in a large naval pinnace manned by efficient trainees of the depot.

At present there is a shortage of Qualified Radio men, and anyone interested is invited to get in touch with the writer at 10 Leeton Avenue, Coogee, or 'phone FX 2303.

Branches have been formed in Brisbane and Melbourne, and interested persons should communicate with Mr. J. J. Nixon, c/o Paul and Grey Ltd., 82 Eagle Street, Brisbane, or Mr. J. Beverage, c/o Rickard and Co. Ltd., Elizabeth Street, Melbourne, who are the Regulating Officers for those territories.

Have a look at the photos before you turn over. They illustrate typical types of cruisers carrying out manoeuvres.

### IMPORTANT NOTICE.

Don't forget to advise your Divisional Secretary of changes in your address. The P.M.G. monthly call list will now be suspended, and this information will not be readily available except from members themselves.

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# VK7WI

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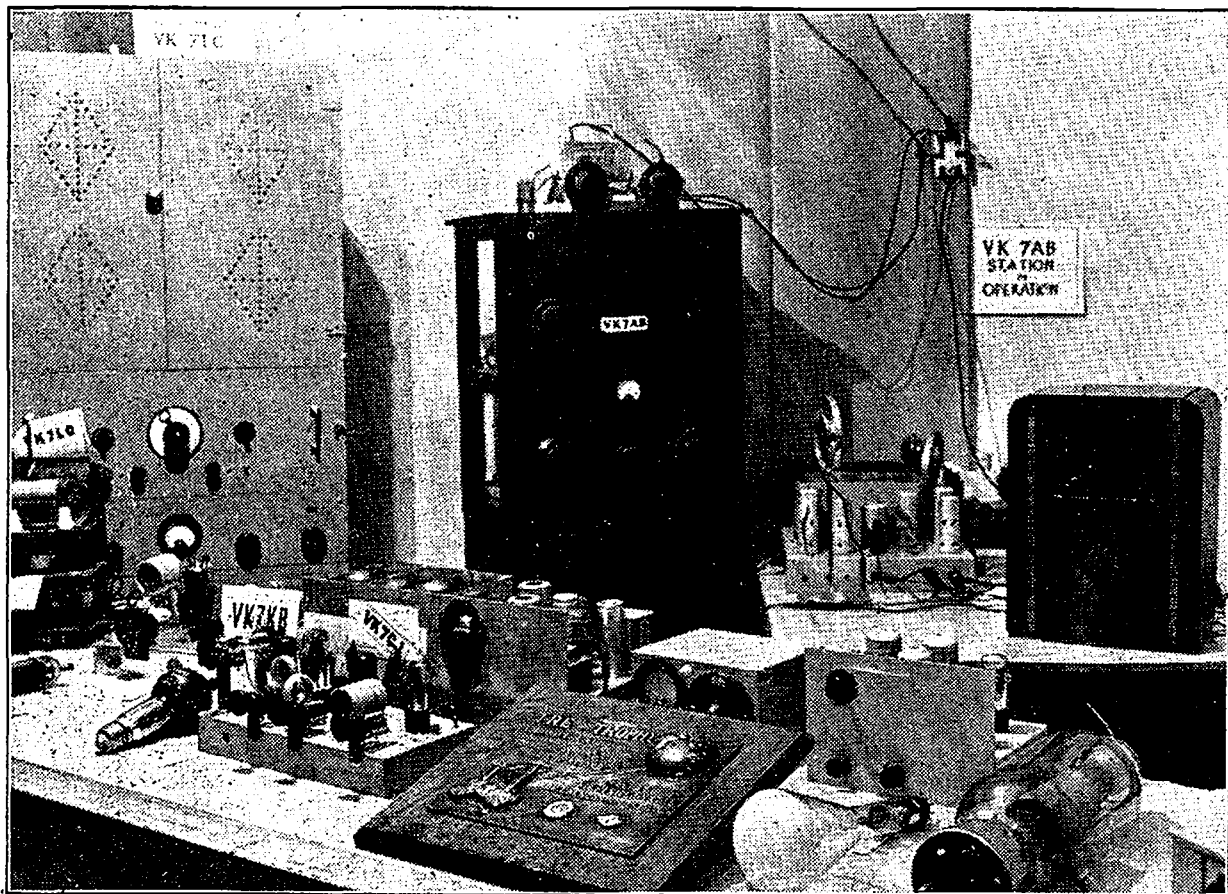
During the Radio and Electrical Exhibition held in Launceston during June, the Northern Zone of the WIA, Tasmanian Division, with VK7WI were responsible for a considerable amount of interest being aroused in Amateur Radio.

The display centred around an actual amateur station in operation, and exhibits of typical amateur apparatus constructed by 7CL, 7KR, 7CJ, 7LG, 7GJ, 7LZ, and 7BQ arranged on a stand in front of the working exhibit. A large size map of the world was shown with tapes leading down from several rare countries to their respective cards on one end of the stand.

VK7AB was the station used under the call sign of 7WI. The transmitter consisted of an EL5 tritet crystal oscillator capacitive coupled to an 807 and link coupled to an Eimac 35T running at an input of 50 watts and modulated by a pair of Osram PX 25's in Class AB push pull.

The receiver was a normal 10 tube super and the antenna a full wave 40 metre zepp.

All costs of installation were borne by the Launceston City Council, who gave us every assistance possible, and erected a very fine antenna.



Amateur Radio VK7WI as in operation from the Electrical and Radio Exhibition, Launceston.

Great interest was shown by the public at all times, especially with the duplex telephony carried out with VK7XL and VK7BQ. We are greatly indebted to VK7XL (Mr. Geo. Groves), who at that time was a non-member of the W.I.A., for his assistance in standing by at all times to contact us when conditions were unfavorable for outside contacts.

High noise level prevented us from making very many DX QSO'S, but several American amateurs were contacted. Probably our best DX were three contacts with Great Britain on two-way 'phone, especially G6BW, who reported us QSA5 R8 solid. Short-wave listeners reported reception of VK7WI from many countries.

Many congratulations were received on the excellence of the exhibit, and we sincerely hope that we have left a favorable impression on all those who saw 7WI in operation.

## WANTED!

*Can anyone devise this equipment.*

The Editor, "Amateur Radio."

Dear Sir,

Here is a chance for some of the Hams who have initiative.

I am looking for a sure-fire method of detecting metallic substances, which are liable to create considerable damage during various processes used in my business, which business incidentally provides the wherewithall for my own Ham activities. So far, I am stumped.

Briefly, the process is one of feeding fibrous material, hessian, bags, etc., etc., into a carding or teasing machine. This machine has therein some hundreds of thousands of small

pins on its many rollers. The clearance between the rollers is in some cases measured in thous. of an inch. Occasionally, the raw material being fed in, is received by us with metallic substances (wire, nails, nuts, bolts and such like) therein, and may be of brass or ferreous metal.

I am looking for a method which will detect these substances before they actually reach the feed rollers of the machine.

There is adequate space for installing some kind of gear on the feed table over which the fibrous materials above move very slowly—approximately 3 inches per second.

It will be seen that a magnetic apparatus is out of the question on account of the possibility of metals other than ferreous types being present.

I wonder whether any of your readers can help me out of my difficulty. It is hopeless for me to instruct the suppliers of fibre that such metallic substances be not present.

Although I use a nom-de-plume, my enquiry is quite genuine, and you have my permission, if you so wish, to make known my name to any person who may write you on the matter.

Yours faithfully,

BI-METALLIC,

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## Sydney Luncheon to

Mr. James J. Malone

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On Friday, August 4th, a luncheon was arranged by the I.R.E. (Aust.) and the R.I.F. Club of Sydney in honour of Mr. James J. Malone to bid him farewell from the Post of Chief Wireless Inspector of Australia, and also to offer him congratulations on his appointment as Deputy Director of Posts and Telegraphs, Queensland.

There were some 120 members of the Radio Industry present, and Sir Ernest Fisk (President of the I.R.E. was the chairman. The Wireless Institute of Australia had official representation at this gathering, which was held at the new Romano's Banqueting Hall in Martin Place. The official party was headed by Mr. W. G. Ryan (2TI), Vice-President. R. A. Priddle (2RA) and J. H. Fraser (2AFJ) were the other members of the Institute's party. Mr. Ryan spoke on behalf of the Institute.

Sir Ernest, in proposing the health of Mr. Malone, paid a glowing tribute to his work, stressing the fact that he had always been fair-minded and broad-minded, too. Mr. C. F. Marden supported the proposal, and went on to say that Mr. Malone was one of the few men who, when he had to say "no" in answer to a request, could make the person who made the enquiry feel that he had gained something from the interview.

Mr. Ryan addressed Mr. Malone as follows:—

"It is my privilege to speak on behalf of the experimental licensees in New South Wales. My association with you has been an indirect one—all matters affecting the Institute and its members were forwarded on to you per medium of our Federal Executive. Despite this fact, I am quite conversant with the courtesy and attention that you have given all matters affecting the Experimenter and the Regulations that we work under.

"During your term as Chief Inspector of Wireless, your Department granted us Experimenters quite a number of privileges, the most important being the granting of a form of self government by means of Vigilance Committees in each State of the Commonwealth. Further, the maximum power to be used without a permit was increased to 50 watts, and again that regulation dealing with interference to Broadcast Listeners and silent hours was more liberally interpreted. I assure you that these privileges have been greatly appreciated and have not been abused.

"During the year 1938, Amateurs looked towards the International Telecommunications Convention held at Cairo with some trepidation. As you gentlemen know, perhaps better than I do, all the frequencies go into the melting pot. We were a little fearful of the result. When frequencies were definitely allotted, and the smoke of battle cleared away from the Nile, Experimenters noted with no little satisfaction that Australia, represented by Mr. Malone was one of the nations that stood by the Amateur.

"Mr. Malone, I wish you every success in your position as Deputy Director of Posts and Telegraphs in Queensland, but I must say that the wish is tinged with regret, as we feel that we Experimenters are losing a good friend and advisor, but nevertheless I can promise your successor the same co-operation as we gave you.

"Mr. Malone, on behalf of the New South Wales Division of the Wireless Institute of Australia, I would like to thank you for the consideration you have shown in the past, and again I wish you every success in Queensland, and I would like to thank the Institution of Radio Engineers

through Sir Ernest for making it possible for me, in this small way, to express the appreciation of all Experimenters."

In his reply, Mr. Malone, who appeared deeply moved by the tributes just paid to him, said he wished to thank all who had come along that day. He thanked Mr. Ryan for his good wishes and promise of loyal support to his successor, and in his concluding remarks, Mr. Malone said:

"This fascinating business of radio will go on from strength to strength, from trouble to trouble, for despite all its static there is nothing static about radio!

"It is impossible for me to forget the wrench of tearing up the roots of radio in which I have been associated for so long, but now I am going to Queensland to be a good Queensland. I will never forget your kindness to me."

---

## Trade Flashes

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### A FOUR TUBE PORTABLE SUPERHET IN KIT FORM.

Six milliamps from a 90 volt battery provides plate power for a new 1-5 volt portable, which has just been released in kit form by Crown Products, of 51-53 Murray Street, Pyrmont, N.S.W.

You will want to build one for Xmas, and your friends will want one, too.

Send a QSL card for circuit diagram and assembly instructions, and don't forget to mention "Amateur Radio."

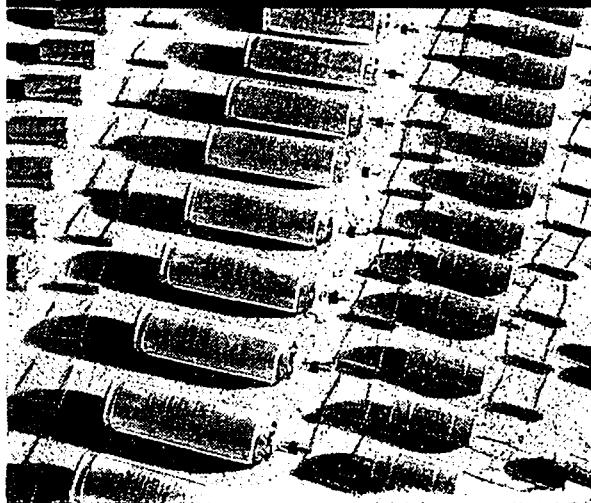
Mr. Anderson, of Australasian Engineering Equipment Co., has promised us several articles on Test Equipment, which will prove very useful for the type of experimenting which we can and will carry on during our enforced absence from the air. This equipment is not factory made, but built by Mr. Anderson himself, and can be easily duplicated by any ham. Look for these articles in forthcoming issues.

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## DX Notes

By VK3MR

Uneasy lies the head that wears the cans! A very appropriate modern mis-quotation. What are we to say about things pertaining to our hobby? Don't let the fascination die, fellows, and all stick together for the sake of "Amateur Radio" and the W.I.A. I will be pleased to answer all letters now! I had some nice, juicy dx for you this month, but why make your mouth water! Eric (BERS 195) will have many rivals now, and receivers will be improved to some order and code, generally should improve, while searching the band for war news. What a treat it is on the lf end of 14 mc, and can you visualise that section of the band being full of T9 CW sigs. Too good to be true! The tumult and the shouting HAS died, just for a while I hope.

We have a good chance to check on the past activities of the dx men, by

listing their dx totals, etc. So please send along your list of countries, certificates and successes in contests, etc. By working UK6WA, brings my total to 121 countries, this being confirmed after delving through thousands of cards and old log books. The following calls have proved to be "phoney" — HV1PP, HZ2GK, LZ1AK, LZ1AP, LZ1C, NZ2A, TA1AA, YN9G, YR2UR. A slight adjustment of lists may be necessary now! BERS. 195 has heard 172 countries and has 143 cards confirming same. VQ8AD ex VQ8AS, of Chagos Is., has now returned to Mauritius. VR6AY will be on the job by the time this goes to print, after his rig has been overhauled by NY2AE. I am still looking for some interesting stories of dx stations. So, what about it, chaps? "Dah De Dah" as the ECO rig said as he passed out of the band.

## *"Business as Usual"*

— IN —

### **Eddystone Short-Wave Components**

The suspension of hom licences in Australia has not meant the closing of the doors completely to the radio hobby. There are so many other phases of interest to fill the gap. Receiver development, U.H.F. reception and direction finding are a mere few that suggest themselves.

Eddystone provides components that fit in every sphere of radio. They are used in the Navy, Army and Air Force at Home and Abroad.

Keep the game going, gang!

**R. H. CUNNINGHAM, VK3ML**

## Station Description

By VK3MR.

There is nothing like a holiday in the country to tone up one's system, especially for a ham who, perhaps has spent more time than was good for him in the shack. This was brought home to me very forceably after the recent Bendigo convention, when I was abducted by 3BM and carried over a hundred miles of plains to his home in Quambatook, which is 200 miles N.W. of Melbourne. The whole atmosphere of the country with its vast open spaces and no hills within a hundred miles in any direction, coupled with the farming activities on the farm and the restful quietness, tempted me to return for a further period, with the intention of having a complete rest from radio, so that I could renew my own activities on returning. It turned out that I found myself amongst radio as I have never experienced before! and I had a real busman's holiday, so much so, that I haven't been on the air since! The first thing that strikes you is a towering mast of 121 feet, which is the main support for all the Vee beams. These aerials are directed to Europe (16 half waves per leg on 14 mc), ditto for Japan and South Africa, and one of only 12 half waves for U.S.A. The big aerials are 558 feet long. The slope down to about 30 feet, and the feeders are all zepps, and are 200 feet long, but with only four spreaders to keep them apart, this cuts out the usual shorting at high RF potentials as at the maximum voltages. All the feeders enter the shack and can be switched on to the tuning unit at will as well as to the receiver. The gain of these ants, both in transmitting and receiving is amazing, and if I was to try and explain just how the sigs. came and left in large quantities, you might think I was romancing.

The transmitter is built into a metal rack, and is two complete jobs, The 14 mc rig is a 41 osc. 6N7 as first

and second doubler 807 buffer feeding a pair of 801's in push pull link coupled to ants and running about 50 watts with 500 volts on the plates. The 80/40 mx rig is brought into operation at the turn of a switch and starts with a 6A6 to 802 and pushing a similar pair of tubes in par. All circuits have meters in them, and a volt meter is also arranged to be switched across any power supply.

The receiver is of special interest. The RF end is separate, and there is a complete set of coils and tubes for each band, divided into shielded compartments and can be selected by a rotating switch with a red light to indicate which band is coupled to the IF channel. The rf section is 6J7 RF. 6L7 Mixer and 6K7 hf. osc. The new receiver, almost finished, contains 2RF stages 1st RF. 956. 2nd 6K7G. Mixer 6L7. and hf. osc. 6F6. E.C. Two channels are on five and ten metres and are 1852—6J5 as in June QST feeding into 7 mc tuner as first IF, the 465 kc as 2nd IF. All this ends up with a G12 speaker let into the wall. The audio equipment is of special interest to fone men. The mike is a D104 to a 6J7 and xtal pick-up and the mike out put from 6J7 feeds into a 6L7 tube with a fader arrangement. This control tube is arranged for peak compression, contrast expansion or straight amplifier. For dx working, the peak compression increases the average speech level 4DB (nearly on R point) without over modulation. An 85 D diode triode amplifies and rectifies part of sig output to operate injector grid of 6L7 for compression purposes. Contrast expansion is used for grammo reproduction, and is performed by a 6C5 and 6H6. The former amplifies and the latter rectifies part of the input and the resultant is fed to the 6L7 injector grid. The 6L7 is followed by a 6N7 (Triodes in par) as a tone control amplifier. There are 144 different frequency response ad-

justments available. Both bass and treble can be boosted in a number of steps, the maximum boost being 30 times above normal level. By cutting out the bass, which uses quite a lot of power, and boosting the treble, greater intelligibility for dx is obtained. Treble cutting is also used to cut out needle scratch. The driver is a 6F6 as a triode transformer coupled to a pair of 807's PP. with 600 volts and the screens kept at 300 volts by using regulator tubes VR 150-30's. Battery bias is used. At normal level the modulator runs at AB1, but if more power is required it can be driven fully under AB2 to give 80 watts UPO. The IF channel, now under construction, starts with a Xtal gate with full variable selectivity. Two stages of IF (6K7's) variable selectivity IF transformers infinite impedance (inverse feed back) 6J7 as triode detector, an extra full gain stage of IF and rectifier for exceptionally effective AVC (6K7. 6H6). 6J7 BFO. 6C5 audio for fones and 6F6 feeding the speaker. Besides the above, Bruce has a 3 inch oscilloscope and associated tubes and a hundred or so knobs to make all sorts of queer patterns, and check his own modula-

tion and yours! What a tale it tells, too. Other gear handy comprises Complete valve tester, universal meters, modulated osc. from 5 to 1500 metres and numerous other electrical gear that we see in radio cat. The most interesting thing is that he runs the lot off 32 volts farm lighting plant! Two convertors are used, one for the transmitter (300 watts) and a smaller one for the receiver, each producing 240 volts AC. Although the house is 6 miles from the town, everything is electrified, and the only thing lacking that the best home in the city has, is noisy electric trams! Bruce himself, between qso's grows wheat and sheep, and is in his element driving the caterpillar tractor with a variety of implements hooked on behind. Everything around the place is turned over by some kind of a machine, and manual labour is kept to a minimum as can be expected with about a dozen square miles to look after. The whole radio gear, as well as the conveniences used on the farm, proves just how much science has triumphed over the older methods, and speaks volumes for those responsible.



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## 28—56 MC Notes

By A. Pritchard, VK3CP.

Well, we have a month of surprises and what a happy month! September 2nd brought with it the telegram, which started the wrecking operations, and visions of many pound notes going off into thin air. Sunday, September 3rd, at 9 p.m., war was announced by the BBC. Of course, it is history now, and it is unnecessary to recall the unhappy thoughts that we had. We must now push on with experiments with receivers, antennae and the like. Each month in the past I have started collecting information for the notes from the 18th; so perhaps I had better include in this issue the items I had already collected. Two things of interest are the portable rigs used by K6PIT and W9BHP portable marine, respectively. The former, using only 8 watts input to his final, had r8 signals practically any time during the mornings. The complete outfit had a 6N7g co-doub. 6N7g doub. 10 mx driving an 807 to the 8 watts. The modulator has 6N7g paralleled, driving 6N7g class B. Probably the powerful sigs were due to his lazy H type beam. W9BHP was on a boat between French Indo China and Honolulu, and his portable has 6A6 40 xtal, 20 mx output and an 807 doub final—6N7g paralleled driving another 6N7 class B for the modulator.  $\frac{1}{2}$  wave dipole gave us excellent signals. The ship's 110V d.c. is used with a rotary converter, and the portable's power supply takes either the a.c. or 12V d.c input. It is interesting to note that the 84 type rectifier has been standing up to 500V output at 150 mills and, considering that this is from vibrator supply, and being an indirectly heated tube, gives us a decent solution to the rectifier problem. Possibly the newer 6X5g would be just as good. Talking of vibrator power supplies, a transformer is under construction here using a shell type core, the centre dimension being an  $1\frac{1}{2}$  inch across by  $2\frac{1}{2}$  inches long and stacked

2 inches high, the winding having  $2\frac{1}{2}$  turns per volt, giving 1000 turns for each secondary winding for 400 volts output, and wound with 30 gauge enamel single cotton. The primary has two centre tapped windings of 30 turns each of 14 swg enamel cotton for 6 and 12 volts inputs respectively, as the windings are paralleled when using 6 volts and are used in series for 12 volts. A  $1\frac{1}{4}$ -lb. reel of each gauge should be ample, depending on construction. A TCC .01mf 2000 volts working condenser must be put across the combined secondary, otherwise the rectifier would be wrecked on the high peak voltages when using vibrator primary supply. 3BQ has suggested that the lads get their receivers going well on 56 mc, and with the aid of 3 element beams, keep a look out for those elusive phones in the States. There have been so many local harmonics from 40, 20 and 10 that weak carriers have been plentiful in the past. Max has been experimenting with two converting circuits in his receiver, the 2nd being fed from a 2000 kc xtal oscillator. The line up is, 1851 rf stage, 6C6 1st det. with control grid injection from a 6C6 HFO—6C5 2nd det. and control grid injection from a 6D6 2000 KC xtal controlled oscillator, 6D6 IF amplifier at 500KC (465) into the normal 2nd det., 77 type with R meter. The results are all that could be desired, with much quieter operation, no images and higher useful gain due to less chance of feed-back with the extra converter stage—R meter readings are only down  $\frac{1}{2}$  on R point, from the frequency meter standard. The hams using the thick-cut 40 mx xtal will be able to use a frequency around 2333 KC or higher, depending on the position in the 7000 KC band, as these xtals are there working on their 3rd harmonic. I make a special appeal for dope on rx experiments or anything suitable for these notes vy 73's.

## Afternoon Entertainment

By T. L. Simpson, VK3II.

As I have seen service in the Flying Corps, I am always interested in things up in the air, so that when I heard that 3HG was buying 4 by 4 oregon, I guessed that he was going to strengthen the floor of his shack. The next time I contacted him I asked him to let me know when he expected to upend it as I would like to take some moving pictures of the event.

In due course I was informed that, with help, he was raising the jury mast, and the big stick would be upended the next Saturday afternoon. I put on a collar and tie, loaded up my camera and set out for Coleraine.

As I neared the homestead, I could see that the big stick was not up, but seeing a pole near its position, I thought, "Well, they have the jury mast up and are waiting for me." When I got near the shack, I saw that the pole I had seen was not the jury mast, and when I got out of the car the QRM that greeted me put me wise to the fact that the jury mast did not intend to act, that Neil had only one helper, and that my collar and tie were quite out of place.

On inspection, I found that "jury mast" was not the proper name for the spar they were trying to upend, as it was a green sugar gum tree about the size of an electric light pole, and as heavy as lead.

My arrival created quite a diversion, so we had an inspection of the mast as it lay on the ground (the first of many). It was 125 feet long, in five sections of various lengths, joined by iron fish plates, with six sets of guys, four wires to the set. The foundation consisted of two hefty red gum posts set in the ground about a foot apart, with a piece of 1½ inch shafting through them on which the big stick and jury mast were hinged. The lower portion of the big stick had extension pieces of 4 by 3 hardwood bolted on to each side, and it was through these feet that the hinge went leaving a four inch space for the jury mast. The stick was lying north and south with the foundation at the north end.

The guy wires to the east and west were connected to the mast and to their correct stay posts, which were

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exactly in line with the foundation and level with it, so that as the big stick lifted the guy wires would prevent it buckling. The guy wires, which were connected to the south were connected to the big stick also, and looked a tangled mass. The guys on the north side were not connected, but their ends were tied to the top of the jury mast.

After inspection and some photos we tackled the jury mast again, and with my extra strength and advice, the help of an extension ladder and a Trewalla jack we raised it about 20%, then 3HG thought that a pull from a truck or two would do the trick. So there was another interval while two trucks were got into position and connected to a cable which, passing over a smaller jury mast connected to the top of the bigger jury mast and out over the big stick. I might state that the country around 3HG is hilly and the trucks could not get much of a grip, as we soon found out. I was left at the mast, which had a rope attached to prevent it going right over, and my job was to see this did not happen, also, when the weight was taken off the ladder that it did not fall and get broken, and from my own point of view, that nothing fell on me.

Well, after much unheeded and unheard shouting, the trucks got under way, lifted the mast off the ladder, which I lowered, and grabbed the rope for the next stage. Then I saw the trucks were slipping, and was just in time to get the ladder back as the weight of the mast came on it. More councils of war, in which I was unjustly accused of hanging on to the rope. (How could they pull up the jury mast and me too). Then another volunteer arrived on a motor-bike, and we raised the mast a bit more with the ladder, and I ran my car round and hooked

on to the trucks. Another concerted pull on all motors, and we drivers could see the mast was rising and we had it up to an angle of about 75 degrees. Chocks were placed behind the wheels, and we reckoned the worst was over.

The guy wires, which were attached to the jury mast were now connected to their proper positions on the big stick. The cable, with which we raised the jury mast, was slackened off, the jury guy wires holding it in place. This cable was then run back in a northerly direction and one truck attached to it. In this position he had a good pull as it was slightly down hill. After the struggle we had with the jury mast, it was child's play to upend the big stick. The truck pulled it easily, and we stopped in several positions for photos, but as it was just on sunset, I am afraid with poor results as far as a live Kodak film was concerned.

The final stage of adjusting the guy wires was done by hand, and at one period the stick assumed a shape which would have made a rainbow blush. However, as I was the only one in a position to see it, the exhibition was wasted, but my advice to pull like blazes on a guy wire half way up was carried out in quick time, and the stick assumed a more upright position.

That for me ended a very enjoyable afternoon. I was surprised at the ease of raising a tall mast, and the fun that could be got out of it. 3HG had his fun later, when he found his guy wire insulators would not stand the strain of the antennas. And he had the stick up and down quite a lot. In fact, I would suggest that if he cannot work DX with it as an aerial mast, he could work fairly good DX with it as a semaphore.

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## Divisional Notes

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### IMPORTANT

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceding publication.

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#### N.S.W. DIVISION.

President: H. F. Peterson.

Vice-Presidents: F. A. Carruthers and W. G. Ryan.

Secretary: C. T. Horne.

Treasurer: H. D. Ackling.

Notes Editor for this Division: J. H. Fraser.

At the August general meeting, Mr. John Moyle delivered a very fine lecture to a crowded meeting on "Communications Receiver Design." Mr. Moyle dealt with the design of coils, and the latest practice in the R.F. and 1st Detector stages of such receivers, and the most suitable choice of tubes. Mr. M. Meyers moved a vote of thanks, which Mr. John Pinnell supported. The motion was carried unanimously by all present.

During this period of suspension of our transmitting licenses, there is no need for us to throw in the sponge. Radio will not stand still, and one will have to keep up-to-date by reading overseas journals and carrying out their own private experimenting with the aid of small pieces of testing apparatus, such as described from time to time in this magazine, and in the A.R.R.L. Handbook.

Every ham should, in his own interests, join the Institute NOW, if he is not already a member, so that he will have a representative body to state the Ham's own case when the time comes for us to go "back on the air." The Institute is our National Organisation, and is admirably suited for this task. I commend the Editorial in this issue for your consideration. The Federal Headquarters are in Victoria, and this magazine will publish any steps that they will be taking in our own interests, and believe me, they have not been idle, because within 36 hours of the suspension of our transmitting licenses, they had held a meeting to discuss future policy and to look after our

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interests. In addition, your N.S.W. Council has been meeting each week for the past month, so it is up to you fellows to continue to support the Institute.

For a start, our Division intends to organise morse classes for members of the militia signal divisions in this State, to enable those fellows who can't get morse practice at home to have a place where they can get additional practice.

The Northern Convention had to be abandoned, worse luck.

A message from the Secretary to all hams! Members or non-members alike. Please write him whenever you change your address. The reason for this is threefold. Firstly, our inwards QSL service will continue to function all the time until the last card has been sent out to its owner. Secondly, the Institute may

wish to circularise everyone about an important matter, and will want to reach them quickly. Thirdly, there will be no P.M.G.'s lists now, each month with your change of address, so we want to keep track of you.

Also our Secretary wants to know of ALL HAMS in this State, who are in, or will have served in the Militia, Permanent Army, Navy, Naval Reserve, Merchant Navy, any branch of the Air Force, or any of the Communications Services of this State during the hostilities. This will include all those who are hams, or were hams in the past, and are now serving their country. We intend to keep an Honour Roll and a Register of all the activities of all hams in this State for the duration of hostilities. So please write in, or get your non-member friends to write to the Secretary and tell him just what you

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are doing. In addition, if you have any difficulty in tracing any of your friends, we may be able to help you, with the aid of our register. The Box number is 1734JJ G.P.O., Sydney.

The QSL office will continue to be open at every general meeting.

Now a word from me. Please continue to support the good old magazine. It will be one way of helping you to keep in touch with "Hamdom" in Australia. If you have any ideas on how to improve the magazine, or can suggest any avenues of research to keep the Hams occupied please let me or the Magazine Committee know them. Any news of members should be sent to me to include in these notes. So the rest is up to you fellows now. Just what is done in the future rests with you.

It is pleasing to note that Waverley R. Club intends to keep going, and to train operators. Good work, Waverley, and thank you for your notes. Lakemba R. Club also intends to keep going, but I have no notes from them yet.

Finally, don't forget the Advertisers, for they will be the ones who will ultimately help to keep your magazine in print. 73 Jack.

Next meeting night, Thursday, October 19th, 8 p.m.

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#### WAVERLEY RADIO CLUB.

"Here's to the memory of 2BV  
Standing unused with silent key."

So quoth the Club's jester, and although true in the main, it calls for some explanation. Although, of course, the transmitter will no longer be heard in its accustomed place in the 40 m band, the Club's activities in the form of morse classes and the like will continue as usual.

On the 5th September, a Question Box night was held. Ivan Bailue gave us particulars of the problems

he had encountered in the building of his portable equipment, and was helped over several very tricky spots by the wealth of information usually forthcoming on such occasions.

Bob Wilson, formerly of Moree, was a visitor at the Club during the last month. We hear that he is to become a member in the near future.

Gordon Wells, former president of the Club, treated us to an interesting lecture on AVC at the meeting on 26th September, explaining the fundamentals in detail and leaving no one in doubt as to "what makes the wheels go 'round."

In conclusion, I would like to invite anyone interested in radio to visit the Club rooms at rear of "Almont," 13 Macpherson Street, Waverley, on any Tuesday night. Members will doubtless be found discussing hi-fi amplifiers and new receivers instead of the number of G's and W's they have worked. F.A.B.

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#### VICTORIAN DIVISION.

As the executive of the Victorian Division is very closely linked with the Federal Executive, we are not yet in a position to outline the policy that the Division will follow. 3WG, the Federal President, has written to all divisions, putting forward a number of suggestions and asking for comments and further suggestions. Up to the time of going to press, the replies had not come to hand, but The Notes of other divisions and the article by the Federal President gives some indication of the trend of thought.

It seems almost certain that the Division will undertake the training of new operators, and the holding of classes for raising present hams to a higher standard of efficiency, both

in code speed and technical knowledge. Arrangements are now being made for lectures on phases of radio which are barely touched by the average ham.

All members are asked to write to the Secretary of the Division stated if they are in a position to assist in the monitoring scheme and to put forward reports on overseas transmissions of news, etc., as set out in the article by the Federal President. When writing, state the times when these observations could be made and the frequencies that could be covered.

We hope to be able to give a detailed programme of work in next issue, and in the meantime, it's up to you to let us serve any constructive suggestions as to lines of research and jobs that can be done.

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### U.H.F. SECTION.

By 3JO.

#### COMPETITION RESULTS.

After distributing some 45 copies of log forms to various hams, it was very disappointing to have only six stations active in Melbourne, and only five logs were returned, thus automatically nullifying the contest. Perhaps the most unfortunate station was 3YL, who made an effort to improve her transmission by installing new modulators, but had the misfortune to strike trouble, and was unable to participate. The six stations in Melbourne were 3LG, 3LX, 3ZV, 3ZD, 3JD and 3JO, no trace being heard of any more distant signals, and none of ours were heard at 3BW.

Any further contests and other activities have, of course, been cut short by the outbreak of war, and unless otherwise decided by members, the section meetings will be

eliminated, but members are asked to attend on the first Tuesday of each each month, when it is hoped to provide interesting and instructive lectures.

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### S. A. DIVISION.

By VK5RN.

A Council Meeting was held on Wednesday, September 6th, when it was decided to hold code classes for licensed amateurs twice weekly, in order to increase their code speed, and to get practice in methods of procedure. The student classes will, of course, be continued, as usual, and as far as possible the South Australian Division will continue just the same.

The first code class was held last Wednesday, September 13th, and a large crowd turned up, in fact, the room was practically full, although there were still one or two vacant chairs left. The class lasted for over two hours, and everyone had a turn at the key. Speeds from 12 to 25 w.p.m. were transmitted, and altogether the meeting was a great success. It is unfortunate that country members cannot take part in these classes, but a solution to this problem is being searched for, and it is hoped that this difficulty will eventually be overcome.

In future, the code classes will be divided into groups, so that each person can get more transmitting, and this scheme should also provide some QRM, which might be a help.

A public meeting will be held on Monday, 18th September, for both members and non-members, so there should be record attendance on this night.

The QSL officer is still handling cards for Australia and overseas, so now is the time to fill out all those QSL cards.

## WESTERN AUSTRALIAN DIVISION.

By VK6WZ.

Where do we go from here? That is the question in the minds of many amateurs since the general QRT. At the September general meeting, suggestions were called for, and many received, including one that the division seek the opinions and co-operation of FHQ and other divisions in matters relating to making sound use of amateur skill and specialised knowledge. The suggestion to amalgamate the existing T.D.S., Field Day and U.H.F. committees into an Activities Committee was carried, and the committee-to-be was entrusted with sorting out and working upon the many suggestions put forward.

Such activities are maintaining present technical and operating standards, the exploration of wired television and cypher fields, and other possible avenues left open to experimenters are to be tackled in the near future. It is also likely that an attempt will be made to meet at

more frequent intervals to keep the division together.

Students' classes are being continued at present, and high interest in these is being maintained. The new quarters in C.M.L. Buildings are modern, clean, cheerful and in the heart of the city, and are appreciated alike by students and full members (hollow and meaningless term!).

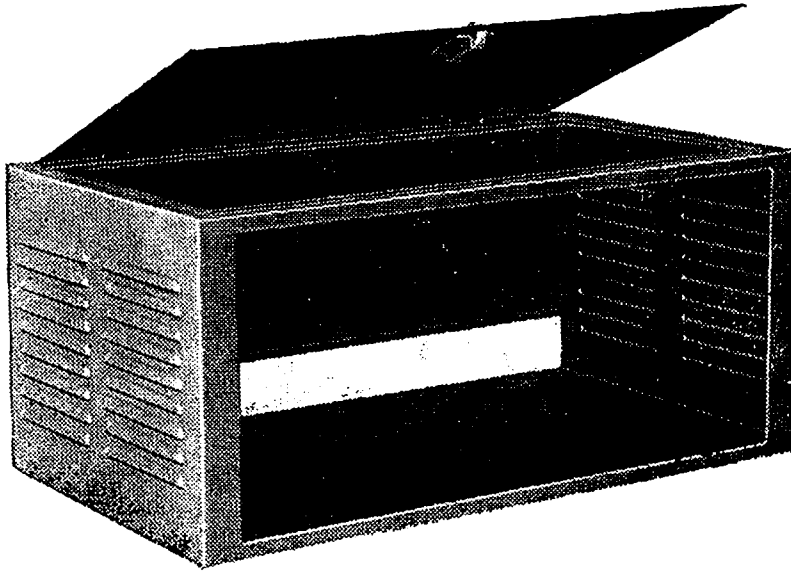
Several VK6's have been called up for the R.A.A.F. and in one quarter, a "B" class broadcasting group suffered a heavy loss of operators in one fell swoop.

The longest faces are to be seen on those chaps who bought new gear just before the outbreak of war. Our sympathy goes out to these chaps with their xtal mikes, xmitting condensers, high voltage trannies, condensers and rectifiers, bugs and new bottles! Rotten luck, fellows!

The months ahead will show where our work lies, and as the various divisions co-ordinate their ideas and work together, things should take on a more settled, even if strange, appearance.



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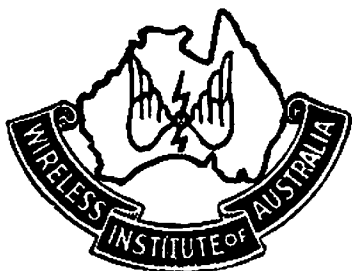
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S.Aus.

VK7EK apologises to quite a number  
of fellow hams for not answering or  
forwarding QSL cards.

On August 14th, he was burnt out,  
home, rig, clothes, cards, stores, etc.,  
and up to the present hardly knows  
where he is.

Will those Hams who forwarded cards  
please repeat them, and those who are  
waiting for 7EK's give him a reminder.

Continued from page 8

4. The **Second Detector** is quite important. The diode detector seems to be the most convenient, because one is able to incorporate A.V.C. and Noise Silencing using such a detector. The latter feature is quite important in such receivers for reasons already stated.

The simple types of noise silencers are to be preferred. The Lamb type is good, but is complicated, and the adjustments are critical. The Circuit of "The Dicket Noise Silencer" is included in the paper, because it is not generally available, as yet.

5. The **Output Stage** requires careful consideration. High power output is not necessary, and it has been found that a maximum of 200 milliwatts is quite sufficient. With a small maximum output available, loud peaks are not so annoying, and a small triode, such as a 6C5 seems quite adequate. If a penthode must

be used, it is suggested that its operating voltages be altered to give a maximum power output of one watt.

6. The **Power Supply** should be well filtered, and the input from the mains should be filtered, too. Finally, the receiver itself should be well shielded, because every lead is a potential input for noise, and a good aerial may be nullified by a poorly shielded receiver. This is a very broad outline of receiver design. Coils should be mounted well away from the chassis, and stand-off insulators for mounting coils are to be preferred to plug in formers of the valve base and socket type at these frequencies. The optimum wire size is No. 18 or No. 20 gauge. Every coil should be rigid, and the winding of coils on formers is quite all right, provided they are not plugged into valve sockets. All insulation should be of the best procurable, namely Trolitol or H.F. Ceramic.

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### *Advertising Department.—*

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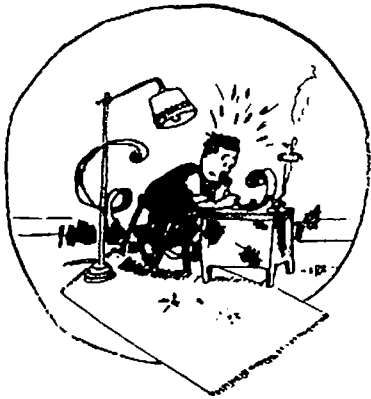
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## EDITORIAL



### ..WHAT CAN I DO?

In these days of War that phrase is in the mind of every Ham in the country who has not already enlisted or been called up for service. Many are in Reserved Occupations, many are on properties in the midst of Harvesting and Shearing, but all are desirous of doing something in this time of need. If your position is such that you cannot enlist for some time to come, there IS still one thing you can do—become a better operator.. Whilst it is no longer possible to practice on the air there is an unlimited number of signals to which you can listen, and the building of a small oscillator for sending practice is a small job indeed.. To those who, in the past, have considered that the CW man was out of date, and that the learning of Morse was a useless drudgery, a real lesson stands out in this time of emergency.. As a W/T operator capable of handling traffic at 25 w.p.m., a Ham is invaluable to his Country to-day, below 16 w.p.m. practically useless, until he has had further Morse training. Operating ability is the prime asset alone. Technical knowledge is naturally of some value, but only as an adjunct, for this business of War is a highly specialised one these days, and from the viewpoint of the Services, operators and more operators are what they need from the Ham ranks.

It is of interest to note what has been written in the Motherland on this subject.. Our quotation is from a letter in "Wireless World." "... far many more operators ... are required than 'technical wizards'. This is true of all the Services, and time has proved it.

Therefore the Services aim at producing the operator first and telling him just what he needs to know about the gear to work it with efficiency.. This is the age of specialisation, and a separate staff is trained to deal with the purely technical side." Another comment, more from the Ham viewpoint is of interest also. "Technical knowledge and proficiency, unless of the right kind, are not enough in themselves. Most wireless people, and particularly Amateurs, tend to be individualists, but individualism is quite out of place in the intricate communication system of the modern Defence Services. Team work, precise synchronisation, and strict adherence to rules and procedure are essential to a successful Wireless Service."

This all means simply and plainly one thing. 99 out of every 100 of our Amateurs, who enlist, will be required as operators alone, and therefore, it is up to every Ham in the country to see he IS an operator, a first-class one, when his call comes.

PURE RESEARCH. Journal of I.E.E., August, 1939.

The President of Massachusetts Institute of Technology, remarked recently that nothing worthwhile ever came out of research directed towards an object. As an illustration, he said that if 50 years ago the lighting trade had carried out research with a view to improving lighting, it would have dealt with wicks, oil, glass chimneys and so on, and the last thing which would have been considered would have been electrons and discharges through gases.

# A Review of Radio Receivers

By Courtesy of The Amalgamated Wireless Valve Co. Pty. Ltd.

## Introduction.

This article is the first of a series intended to cover, fairly comprehensively, the field of Radio Servicing. Each paper will be devoted to one phase of the subject, without any attempt at generalisation.

In this, the first, it is intended to consider the high-frequency section of existing receivers, with particular attention to those aspects which concern the service engineer.

The discussion is necessarily brief and the reader would do well to follow up the subjects introduced, in the third edition of "The Radiotron Designers' Handbook," which is soon to appear. In this publication the subjects are approached from the point of view of a designer, but much of the information will be found invaluable as a background for service work.

**(A) Aerials.**—Listeners in remote country districts invariably realise the need for an efficient aerial and earth system. Such an aerial, however, has disadvantages even apart from its cost and unsightliness in urban areas where field strengths from desired stations are high.

One disadvantage is that a large aerial seriously loads, and impairs the selectivity of, the first tuning circuit in a receiver. In modern receivers the effect is not usually serious, but in older T.R.F. sets having low initial selectivity the loading was quite sufficient to cause interference between stations, and necessitated different tapplings for long, short and medium aerials.

Another disadvantage, which is manifest in modern receivers, lies in the fact that high input voltages invariably mean high values of bias on the bias-controlled amplifiers. The net result is that in most cases the intermediate frequency amplifier is called upon to handle large inputs when operating on the bent portion of its characteristic. The resulting "Envelope Distortion" contributes materially to the overall distortion

in a receiver. In most receivers the effect becomes apparent for inputs above .5 volt.

A very similar effect occurred in certain old type receivers in which a variable bias was applied to sharp cut-off valves such as type 224 (24A). The distortion in such cases became very distressing indeed when the volume control had to be turned back to cope with strong signals.

The average "picture frame" aerial is, however, far from ideal in that when the receiver is not earthed, much of the signal arrives through the house and even the street wiring, and the aerial wire acts in the manner of a counterpoise. It is not difficult to imagine what variations in signal input must occur when lights are switched on and off, or when badly installed conduit gives varying resistance with changes of temperature or mechanical vibration.

Effective A.V.C. systems minimise these effects although the receiver is still in a position to reproduce any electrical interference arriving through the mains. Before the general adoption of the A.V.C. changes in electrical circuits were very often manifest in a sudden change in set output. A very large proportion of service calls for fading appear to be directly attributable to this cause. The routine treatment is to fit an effective earth, and in extreme cases a line filter.

One interesting fact in connection with aerials has been demonstrated by F. R. W. Strafford (of Belling and Lee Research Dept.), that the effectiveness of a receiving aerial is very nearly independent of thickness, within, of course, reasonable limits. The maximum loss of one aerial of 38 S.W.G. as compared to one of 18 S.W.G. was 3 dB in a range of 16-1875 metres.

For obvious reasons it is preferable to use enamelled wire for aerials rather than bare, or even cotton-covered wire. The unprotected metal surface soon becomes badly pitted when exposed to the weather, especi-

ally in localities where the air carries corrosive fumes from factories.

**(B) Aerial Coil.**—Before discussing the aerial coil or indeed any radio frequency circuit in a superheterodyne, the function of the frequency changer must be clearly understood.

When the oscillator section of such a valve functions it produces not only a fundamental frequency but many harmonics. Each one of these is mixed in the valve with the incoming signal to produce sum and difference frequencies, all of which appear in the plate circuit. It is the function of the intermediate amplifier to select and amplify the one wanted frequency, rejecting all others. These latter cannot normally produce any audible tones.

When, however, some carrier frequency in addition to the wanted signal arrives at the signal grid, this carrier frequency beats with a harmonic from the oscillator which may produce a frequency at or near the intermediate frequency, and sufficiently strong to cause an audible beat note with the desired signal.

It is the function therefore of the signal frequency circuits to attenuate as much as possible all signals but the desired one.

Again it is generally realised that of all valves in a normal receiver, the frequency changer introduces the most noise. For this reason it is highly desirable to have as much gain as possible ahead of this valve.

In a typical 4-5 superheterodyne the responsibility of selectivity and gain falls entirely to the tuned aerial coil, so that its design and alignment are critical factors in receiver performance.

Up till recently the usual aerial coil consisted of a low impedance primary wound about the "cold" end of a solenoid of solid wire. Although fairly satisfactory on local stations, such an arrangement left much to be desired when distant signals were to be received.

One characteristic common to most receivers is that they tend to be more sensitive at the high frequency end of the bands where the L/C ratio of the tuning circuits is higher. The low impedance primaries usually associated with solenoids when connected to a large aerial resonated just beyond the high frequency end of the band, or in the worst cases, just inside the band. The result was

to increase further the high frequency sensitivity and to accentuate the variation across the band.

The modern high impedance primary is so designed that with the shortest aerial likely to be used, it will resonate below the low frequency end of the band. A single turn in series with the "hot" end of primary wound in close proximity to the "hot" end of the secondary gives some capacity coupling between aerial and grid, and tends to maintain the high frequency sensitivity. Such a coil may be so adjusted as to give, in conjunction with the remainder of the receiver, a fairly level sensitivity characteristic.

Moreover, the simple solenoid secondary has largely been discarded, since in the broadcast band much better selectivity and higher gain are attainable by the use of litz honeycomb winding and powdered iron cores.

When, as often happens, the service engineer is faced with a set having high noise level and objectionable "joys" which cannot be eliminated, the trouble can frequently be minimised by the simple expedient of replacing an old fashioned aerial coil with a modern type.

On the short-wave band the position is different, and interwound coils with low-loss formers and heavy single-strand wire for the secondary are commonly used. Iron cores have been used to a limited extent on the short-wave band, but their advantages are less marked than on the broadcast band.

**(C) R.F. and Oscillator Coils.**—The foregoing remarks apply in general to the R.F. coil, but not for the oscillator coil, where the problem is quite different.

Here the solenoid is generally regarded as satisfactory, although for reasons of symmetry and compactness some designers prefer the more modern type of winding.

Apart from correct electrical design the oscillator coil must be, firstly mechanically rigid, and secondly impervious to moisture. Both requirements are readily fulfilled by a compact honeycomb winding dipped in a good wax. Many receivers have been produced in past years having untreated oscillator coils, and great difficulty has been experienced in that, during damp seasons, the oscillator has failed to function on the

low frequency end of the band. The effect is particularly noticeable in battery receivers where the oscillator has less in reserve.

The trouble may usually be remedied by thoroughly impregnating the coils in hot wax of a low-loss variety.

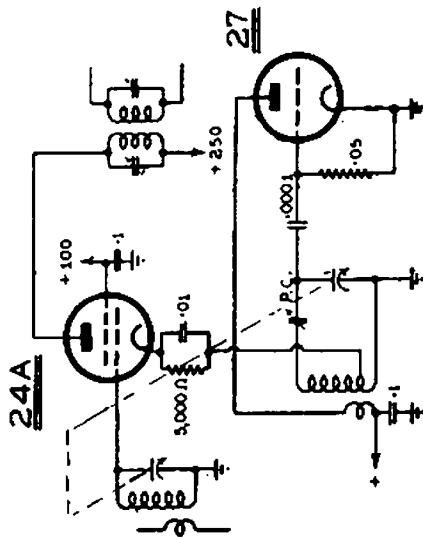


FIG. 1

**(D) R.F. Amplifiers.**—Early radio receivers, few of which were superheterodyne, employed general purpose triodes as R.F. amplifiers. Due to their high grid-plate capacitances the valves were prone to instability and receivers were normally limited to a single low gain stage ahead of a regenerative detector. The introduction of neutralisation made possible the use of two, three or more stages with much higher overall gain and selectivity.

Radio frequency tetrodes with lower internal capacitances (grid to plate) eliminated the need for neutralisation and made possible much higher R.F. gain. Modern R.F. pentodes such as type 6U7-G under optimum conditions give good stage gain to frequencies as high as 30 megacycles. At such frequencies the importance of coil formers and gang insulation cannot be over-emphasised. For instance the Q of a coil can be improved two or three times by substituting a trolitul former for some types of cardboard or bakelite. Coils for broadcast reception have already been discussed.

In a superheterodyne, the desirability of attaining high gain and selectivity ahead of the frequency changer has already been stressed, and it is obvious that an efficient R.F. stage affords both. From experience it seems that an R.F. stage is highly desirable in receivers intended for country use, or where the user is interested in long distance reception whether on broadcast or short-waves. Apart from the improvement in signal to noise ratio and image ratio, the added sensitivity contributes materially to the effectiveness of the A.V.C. system, as seen in its ability to cope with a weak fading signal.

In suburban areas where the receiver is rarely tuned to any but local stations the R.F. stage may not justify its cost.

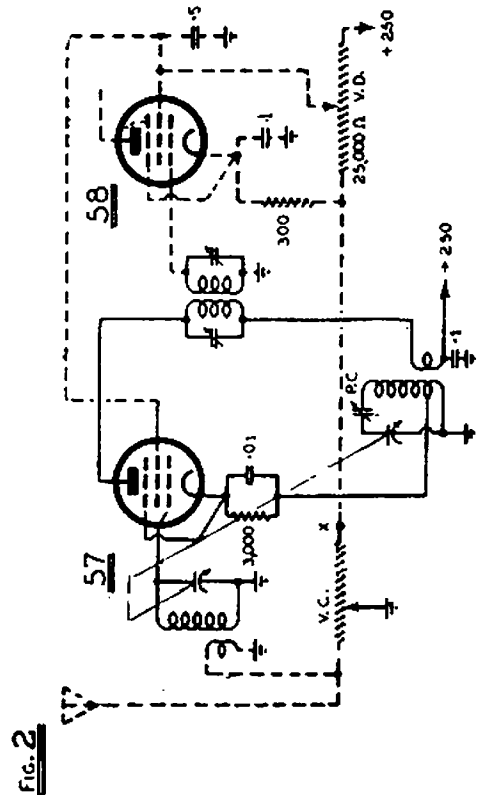


FIG. 2

**(E) Frequency Changers.**—Something has already been said on this subject in section B. Briefly the function of the frequency changer is to mix with the incoming signal another generated by itself, of a separate oscillator valve, to produce a frequency equal to the intermediate frequency of the associated receiver.

Three types are commonly met in radio service work, namely tetrode or pentode mixer with separate oscillator, autodyne, and pentagrid converter.

The first of these was very popular about 1929 to 1930 in the form illustrated in figure 1, and used the then modern type "24" with a "27" separate oscillator. The arrangement was generally very reliable and servicing rarely goes beyond replacing some faulty part or valve. Occasionally it may be necessary to repair an open circuited winding.

The autodyne, which came into popular favour about 1932, was rather more critical in operation than the older circuit. Figure 2 is a typical circuit arrangement. Frequently the oscillator coil assembly was mounted in the same can as the first intermediate, but this did not lead to any ill effects due to the widely different working frequencies.

In all autodyne circuits the primary of the first intermediate transformer is in series with the oscillating circuit, and since the oscillator frequency is higher than the intermediate the reactance of the transformer is capacitive. (See figure 2). For this reason the primary of the intermediate transformer should always be designed for high C, to offer as little impedance as possible to frequencies higher than the intermediate frequency. This point should always be borne in mind when dealing with this type of circuit.

One serious disadvantage with the autodyne is that it cannot be used with variable bias to control the gain. Hence effective A.V.C. is impractical with 4-5 valve superhets using this circuit. Even manual volume control presented a problem in providing smooth control on the strongest stations. The dotted portion of figure 2 illustrates the usual method adopted. The potential at point X on the volume control is very important. If it is too low the volume

control becomes very critical on a strong local, and frequently complete attenuation is not possible. Too high a voltage will cause the intermediate amplifier to reach cut-off before the signal is sufficiently attenuated at the aerial terminal, and very distressing distortion can occur. The aerial shorting path needs to have a very low resistance, particularly with a low impedance primary. It is advisable to take the aerial lead directly to the volume control terminal and thence to the coil, as this ensures the most effective shorting.

Autodynes have seldom, if ever, been used commercially in dual-wave receivers due to the difficulty in maintaining satisfactory oscillation across the short-wave band.

The introduction of pentagrid converters made possible the application of A.V.C., and later dual-wave reception, to small receivers. With old intermediate frequency transformers the pentagrid gave less sensitivity and selectivity than the autodyne, but this was soon offset by the more efficient intermediates and coils which were introduced. A typical pentagrid converter circuit using the type 6A8-G is shown in figure 3.

Generally speaking pentagrid converters are not critical in operation, but there are certain points to watch. Element supply voltages should be maintained reasonably close to manufacturers ratings, as under some conditions excessive current may flow to one or other of the electrodes and cause overheating and release of gas. Again the oscillator grid current, which is an indication of oscillator amplitude, should be maintained within the limits given by the valve manufacturers for the particular frequency at which the valve is

## HAMS!!

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operating. Insufficient grid current means low conversion conductance and loss of sensitivity. Excessive values also cause low conversion and conductance, and in some cases very noisy and erratic operation. In all cases the oscillator grid leak should be of the recommended value.

A grid current test can be applied to all common oscillators (with the exception of the autodyne) as a test for oscillation. To do this an 0-1 milliammeter is connected in series with the cold end of the oscillator grid leak. If the valve is oscillating a definite deflection should result, being usually between .1 and .6 milliamp. Battery converters usually operate with lower grid currents than A.C. types.

The best test for autodyne frequency changers is to measure the plate current, first normally, and then with some section of the oscillator coil shorted out. The plate current of an autodyne should fall appreciably when oscillation is suddenly stopped.

The popularity of short-wave reception has emphasised some shortcomings of normal pentagrid converters which are not so evident on the lower frequencies. One is that any variation in the voltage applied to one or more of the electrodes tends to change the frequency of the oscillator section. By far the most important of these to the listener is the effect of the variation in signal grid bias caused by A.V.C. circuits. The drift is negligible on the broadcast band, but is quite serious on the short-wave channels. The effect is that as a signal varies in strength it causes a corresponding variation in A.V.C. bias, which when applied to the converter grid alters the frequency of the oscillator and therefore of the I.F., which is equivalent to detuning. Distortion as well as loss of sensitivity usually results. An obvious cure is to operate the converter on fixed bias, but in receivers where the number of controllable valves is limited this is not always possible.

The supply voltage in the receiver has also a marked effect on oscillator frequency, and many motorboating complaints are traceable to this. When a strong signal is tuned-in the plate current (and hence plate voltage drawn from the power supply) varies, and tends to detune the oscillator. The resulting drop in signal restores original voltages and

once again the oscillator returns to resonance, and the original cycle is repeated. If, as frequently occurs, the time constant of the anode supply is sufficiently short, and the frequency drift of the oscillator appreciable, an audible "motorboating" is produced. Obviously the removal of either condition eliminates the trouble. The recommended treatment is to feed the oscillator anode directly from the rectifier filament through a resistor, and to by-pass the plate feed with an 8 mfd electrolytic condenser.

Two valves, namely, the 6K8-G and 6J8-G, have been developed with a view to reducing frequency drift and its attendant complications. The 6K8-G oscillator coil differs from the normal design in that approximately one half the usual number of feedback turns are required for optimum coupling. Overcoupling

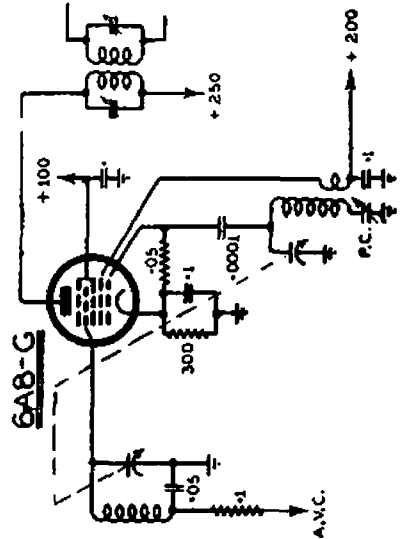


FIG. 3

as would occur with a standard coil usually results in unsatisfactory and noisy operation. Maximum oscillator anode voltage is 100 volts, the recommended practice being to supply both screen and oscillator anode through a common 15,000 ohm resistor. The 6J8-G has a high plate resistance which improves the selectivity and also, when it is followed by a high Z (Z equals dynamic resistance) intermediate frequency transformer, enables good sensitivity to be obtained. In order to improve the oscillator strength and stability, the tuned oscillator circuit for the 6J8-G is frequently placed in the

plate circuit, and the untuned (primary) winding in the grid circuit. Although these two valves may appear from a circuit diagram to be similar to a pentagrid both valves represent a radical change in valve design.

**(F) Intermediate Frequency Amplifiers.**—As already indicated, the image ratio and signal to noise ratio of a superheterodyne receiver are almost entirely a function of the gain and selectivity of the signal frequency circuits, but the final selectivity curve and to a lesser extent the sensitivity are determined by the design of the I.F. amplifier.

The majority of home receivers employ but a single amplifier valve in association with two high gain I.F. transformers. The maximum gain attainable by this arrangement is no more than necessary for modern requirements, and some designers prefer to use two lower gain stages which, despite the cost, can be made to give a much more ideal selectivity curve, in that although the adjacent channel selectivity is better the peak is less pronounced and more rounded. This latter point is very important in the attainment of fidelity of reproduction, since a sharply peaked selectivity curve invariably results in serious high note attenuation and "woolly" reproduction. Even well designed two stage channels exhibit this failing to a lesser extent, and accounts for the arduous searchings of engineers for a cheap and reliable method of obtaining a flat topped selectivity curve. More may be said in this connection at a later stage.

Actually sharply peaked circuits are desirable in communication receivers when receiving C.W. signals, and regeneration or crystal filters are used to obtain this result.

Early I.F. transformers consisted of two solid wire honeycomb windings tuned by two mica dielectric compression type trimmers, mounted on a moulded bakelite base. In the search for higher Q which followed the introduction of pentagrid converters and diode detectors, and of course dual-wave reception, the solid wire was rejected in favour of multi-strand litz, which gave much lower values of "skin-effect" resistance. The insertion of an iron-dust core in the windings allowed the same values of inductance for much less wire, and hence still lower high frequency resistance.

The mica dielectric trimmers pre-

viously mentioned were characterised by two serious failings. The first was a slow change in capacitance as the adjustable plate gradually lost tension and altered its shape. In some cases where particularly robust plates were used the change in capacitance could be traced to the rivets at the fixed end of the variable plate. The second drawback was that unsuitable mica and bases tended to absorb moisture in humid weather and allowed serious high frequency leakage to occur. Careful selection of raw materials and better design were found to minimise both effects, but many designers were still not satisfied. Air dielectric trimmers are an obvious solution, but are bulky and costly without always being rigid mechanically.

A very satisfactory arrangement is to use a sealed fixed tuning capacitance and to vary the inductance of the coil by means of an adjustable portion in the iron dust core. The resultant gain and frequency stability meet present day requirements.

The intermediate frequency has an important bearing on the performance of a receiver. For satisfactory converter performance a certain percentage difference should be maintained between the local oscillator and signal frequency. If the maintained between the local oscillator tends to "lock" with the incoming signal. This tendency, of course, varies widely with different valve types and circuit arrangements but must be taken into consideration when original design work is done.

In normal superheterodyne receivers a station tends to reappear at a frequency removed from its calibrated position by twice the intermediate frequency. Most receivers operate with the oscillator higher than the signal, so that this "image" would appear at a lower frequency than the correct position. The attenuation of this "image" is determined solely by the selectivity of the signal frequency circuits.

The early adopted standard of 175 Kc/s. allowed adequate gain and selectivity to be obtained from comparatively cheap I.F. transformers, but tended to produce images only 350 Kc/s. away in a band which was 950 Kc/s. wide. Adequate image suppression with the coils then available called for at least two tuned circuits ahead of the frequency changer. This meant that 4-5 recei-

vers were almost invariably fitted with pre-selector coils.

The general adoption of 465 Kc/s. as the intermediate frequency has eliminated this trouble since the images normally fall beyond the limits of the broadcast band. The loss in gain and selectivity has been made up largely by improved transformer design.

On the short-wave bands where the selectivity of the signal frequency circuits is comparatively poor, images are very obvious but are usually tolerated in household receivers. Special communication receivers for short-wave reception almost invariably use several stages of I.F. amplification at a frequency of about 1,600 Kc/s., giving images which are 3.2 megacycles away from the calibrated position. In some cases two frequency changers are used. The first changes to a high frequency to avoid image reception, and the second to a fairly low frequency for the sake of obtaining high gain and selectivity.

When aligning I.F. amplifiers care must be taken in the final selection of frequency to avoid heterodyne whistles on some stations. When this trouble does occur, it is generally possible to shift the whistle to a position on the dial where it matters less by shifting the intermediate frequency by a few kilocycles per second.

(G) Detectors.—The question of detectors in relation to audio fidelity will be dealt with in the next lecture, and it is proposed to discuss detectors at this juncture only in respect to their effects on the tuned circuits with which they are associated.

The operation of the grid leak detector is well known and scarcely warrants repetition in full. Since such a detector operates under conditions of zero bias, the control grid

draws current over portion of the input cycle, and in so doing loads the input circuit and reduces its Q factor. The application of a positive feedback offsets this effect and results in an apparent Q factor much higher than the original. The grid leak detector with positive feedback is eminently suited to positions where detector sensitivity is of prime importance.

When, with the introduction of R.F. tetrodes and pentodes, it became possible to achieve high gain before the detector, "reaction" with its undesirable features was no longer necessary and designers rejected the leaky grid detector in favour of anode bend detection with a screen grid or pentode valve. This latter detector operates with a high negative bias on the control grid and hence offers no appreciable loading to the input circuit. The gain is high and the output voltage capabilities better than the grid leak detector. Nevertheless distortion in an anode bend detector is much higher than in a well designed diode circuit, and it does not offer facilities for obtaining A.V.C. bias. With few exceptions modern usage of anode bend detectors is confined to communication receivers where lack of circuit loading is important.

The operation of diode detectors is discussed in section 1 (A.V.C.). In general, the diode is characterised by its ability to handle large signal voltages, by low distortion and lack of gain. However a modern duo-diode high-mu triode or duo-diode pentode is capable of giving gain in a "single" valve comparable to earlier types. For normal household receivers it would seem to be the obvious choice.

End of Part I.

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## Double Detecting Super Experiments

By M. Howden, VK3BQ.

---

In these days of silent local bands and skeleton racks taking up useful room in our shacks, we seldom bother even to go into them, but now and then the old urge enters and we switch on the RX to see what is doing on the bands overseas. Now is the opportunity to solder that loose connection that we have not been bothering about.

And now the set is quieter there is still not much satisfaction in just listening when you can't even try to raise the DX. Why not try a few experiments to see if we can improve the receiver still more, and then, when we get on the air again, we can make the most of it.

That Dope on the double detecting super in July QST by W9CJJ and W9AUJ gives one something to think about. Suppose we pull out the first 465 KC IF tranny and substitute a 1600 KC in its place, and couple up the frequency meter through a small padding condenser to the control of the 1st IF tube. Not so good, because we have not lined up the two circuits of the 1600 KC tranny. Perhaps the easiest way to do this will be to run the grid lead from this tranny straight on to the second detector and get it somewhere near, and then revert to the former arrangement, leaving the set tuned to a strong signal while the change is made and then swinging the dial of the frequency meter until they come in again. A slight re-tuning of the grid circuit will be needed now to counteract the detuning effect of the grid loading on the 1st RF tube, and we find that signals are down to a point or so on what they were before but the set is much quieter and the double spots have completely disappeared and if there was a tendency to self oscillation before it will have gone now and the gain can now be turned right up so that there is no loss of signal strength.

The trouble with this grid injection in the second mixer is that the oscillator (Freq. meter) damps the circuit rather badly so that the conversion gain is rather low. Anyway, there will be plenty of time to fix that next time we come into the shack.

The output from the normal meter is rather low and anyway we don't want the frequency meter continually tied up as a fixed oscillator. Take a note of the exact frequency for future reference and let us substitute any standard "mixer" valve in place of the original 1st IF amplifier. "Bill" was saying the other day that he had a spare, so I'll borrow it and see how she works. And so to bed.

A couple of nights later the urge is once more upon one and having seen Bill in the meantime and succeeded in putting it over, we enter the shack again and listen for a few minutes while the iron heats up. The trouble is that this fixed oscillator coil will have to be wound, and its size must first be calculated or guessed. Let's see—our old IF was a shade higher than 465, we'll say it was 470 kc, and our new one is round 1600, so that our oscillator will want to be about 1600 plus 470, that's 2070 KC. I know, I'll get a good idea of the size of the coil from the frequency meter coil. Or better still why not rub down that old 200 mx crystal to about 2070 and see what happens. Down she comes, and the output getting better. No, now it's falling again, I suppose one corner is high. Now it's double peaking—well, we'll edge the brute. 'Ah; that's got him, but it's away down on about 2090 now. Never mind, we can easily retune the IF's to suit that instead. Now there is still the need of a plate coil for the oscillator, and since it will be more convenient to mount it under the chassis and right up against the valve socket, it will need to be quite small. An old Marquis

former cut short and with the base part removed will be the very thing and give one hole mounting. If my judgment is right, about ninety turns of 30 DSC on this former will cover 2090 KC nicely when it is tuned with a little padding variable, so here goes. Ah; the iron is well and truly hot, so I'll alter the connections before worrying about the crystal holder. The old one out of the perk would do, but I may want that again soon, so a couple of plates the size of this little crystal will do, supported by its leads and held loosely together with a rubber band round each way, will do for the tests.

Well, those connections look all right. Now, I wonder if that crystal will oscillate. I'd better screw the padder right out to start with and see if the set will note. She is taking a long time to warm up — something must be wrong somewhere. No, there's a signal, but mighty weak. Of course, I've got to re-line the IF's to suit the 2090 oscillator. Here she comes — now for the other circuit. Yes, that is a signal. It sounds near, but can't be a local. I have not adjusted the triode oscillator for maximum output yet either. The old set used to work on its side and should still do so as long as the crystal does not slip out of the rough holder. That's got her. Now where is the padder screw. I'll have to bend these leads so that I can get at it easily. The oscillator is stable enough. That's made no difference, so now I'll screw her down. Whew! listen to that conversion gain coming up. Oh! that is too far. It cuts off dead when the crystal stops oscilla-

ting. That's about the best setting, so I'll leave it at that. Now I had better set the old freq-meter as a signal generator again and line these IF's properly. That did not take long, and now for some signals. Yes, there are plenty of them, and there is someone talking Spanish, South American, I guess.—Was that a knock at the door? Who would come at this time of night? Oh! Hullo, Bill, come and hear a real receiver. No double spots, far more selective and the background away down. "Yes, it sounds the goods all right, and the signals seem as though they are nearer somehow. That Yank might almost be right here in the room. How do you account for it?" Oh, I put it down to the lack of interlocking in the mixers. The first is 1600 KC off the incoming signal, and I am using a crystal oscillator in the second, and you can't pull a crystal off its frequency, you know. The 1st IF tranny being on 1600 instead of them all being on 465 makes it possible to turn the wick right up and there you are.

"All right, I'll take your word for it—I can't stay now. Only dashed round to collect my valve as I want to try some experiments myself. This it. Thanks, cheerio."

Good-bye, Bill. Darn. Now I'll have to go and buy a mixer valve.

---

TO THE POINT (QST, August 1939).

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## WHAT TO DO WITH MY RADIO GEAR!

By "Emmel."

That's the question!

How often, in the last few weeks, have you ambled moodily into the shack, cast a longing glance at the rig, at the new bottles, the old key, the time honoured junk . . .

Breathes there a Ham whose soul hath not said, "Why must I let it lie so? Why can't it be used? What use can I put it to other than its original allotted job?

Suddenly the thought dawns that all the valves, transformers, condensers, instruments — indeed even the racks and chasses could be adapted to other uses. When connected a certain way, they are known to perform the most wonderful of modern miracles. Why not try connecting them in other ways and see what results can be obtained?

Many of the greatest advances made in the course of developing the Science of Electricity have been due to the adaptation of ideas or designs brought to a certain stage by the neighbouring sciences and then rejected or shelved for some reason. That's a pretty bald statement, but read it again, then try and think up an instance. You, who have delved into the progress of science won't find it difficult. The early development of the Radio Valve is an excellent example.

Already Radio Valves are being put to industrial uses quite divorced from wireless applications. In fact, they have led to the production of special tubes for these purposes. Hence we have Thyratrons, Ignitrons, Phanotrons and more "Thingummytrons" to come. Their development has lagged several years behind that of Radio Valves, but this only gives us a start over the other hobbyists or pseudo-scientists.

Most hams have a very up-to-date knowledge of recent advances in Thermionic Valves, and hence are well equipped to study the new fields. Of course, one cannot expect hams to emulate the successes of well staffed scientific laboratories, but it must be admitted that we have a knack of doing big things with a minimum of equipment. Indeed, this very fact has been the despair of

many a learned Professor, who has tried to coax his occasional ham student into using complicated methods when makeshift ones appear to give the same answer!

The idea I've been hatching is that we can get new diversions and build up a new hobby by putting our radio gear to new uses. They need not be so ambitious as suggested above. Even the most humble ideas can render a great deal of pleasure and satisfaction.

No doubt the Pick-up and Turntable will continue to rattle the china-ware and rouse the neighbours, the short-wave receiver will be in its element getting the latest news from overseas, and the instruments in the rig will make up a nice test kit for future use.

Supply houses already report an increased demand for cathode-ray tubes, indicating that many hams have turned their attention to this very absorbing field.

But can someone tell us how we can use our old moving coil speakers. maybe to provide inter-bedroom communications or front door to kitchen communication? (That would shake

the vacuum cleaner salesman!) Can anyone give us hints on making gramophone recordings at home? Can we get a lead into home talkies?

I'm sure we can. All these and many more fields can be covered in this magazine by hams who will have obtained results and are glad to pass the information on. Someone may tell us how he remotely controls his junior ops. toy railway, somebody else may describe a burglar alarm. These are just scattered thoughts and probably dozens of others will suggest themselves to you.

We want to work valves and radio gear into these gadgets as much as possible so we can keep familiar with them. It is vitally important that when hostilities cease, and we approach the authorities for new licences, that we produce evidence of having kept our knowledge of Radio Theory fresh.

In the past, we have been accustomed to swapping ideas over the air, we must now air our ideas through this magazine, which is our only common hander out of information.

Go to it!

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# A Noise Limiter with Automatic Control

(Incorporating Infinite Impedance Detector and Amplified A.V.C.)

By K. Heitsch, VK3HK.

After looking through various "mags," and trying just about every type of noise limiter without obtaining results that satisfied the writer, it was decided to experiment a little and the circuit described is the result. The oscilloscope proved very useful in these tests. This limiter is just as effective as the best I had previously tried, but with the additional advantage that the signal can fade badly without requiring any manual adjustment. An initial adjustment of the threshold control on no signal is all that is required.

In order to obtain satisfactory results on fading signals, I would advise the adherence to the circuit values given, as these were experimented with to get the best results. The infinite impedance type of detector has advantages over the usual diode in (1) better selectivity, (2) higher gain than diode, (3) high fidelity (it will handle 100% modulation with less distortion than a diode).

In order to check the damping imposed on the secondary of the I.F. transformer when nursing a diode as compared to the inf. imp. detector, a test was made. The oscilloscope showed the I.F. signal voltage on the secondary and then the plate voltage was removed from detector so making it a diode in action. The signal voltage dropped to about half, indicating a drop in impedance imposed on the secondary by the diode. In explaining the circuit, it will be noticed that the positive drop across the .1 and .25 meg. resistors in series is more than balanced by the negative drop across the earth end of the 15,000 ohm potentiometer, so biasing the 76 grid negatively. By adjusting this, it is possible to bring the A.V.C. line to earth potential. The writer uses a magic eye on the A.V.C. line and adjusts till the eye is only just wide open on no signal. Before making the above adjustment, turn the 10,000 ohm potentiometer to the 5000 ohm

resistor end. A carrier on the 6C5 grid will cause the 76 grid to become less negative, due to the increase in the positive drop across the .1 and .25 meg. resistors, the A.V.C. line will then become negative.

The noise limiter 6H6 picks up some of this negative voltage, so delaying its action and stopping it from blocking with the carrier. With the resistor values given and a measured 50 volts negative above earth at the point indicated, the 10,000 ohm potentiometer is adjusted on no signal so that the background of the receiver is just starting to be cut off. It will then be found that even the strongest signal will not block when the A.V.C. is being used. When the switch is off, the 6H6 gets a negative voltage from across the negative end of the 15,000 ohm potentiometer applied between plate and cathode, putting it out of action. The two diodes of the 6H6 are used in parallel.

The 50 volt negative may be obtained by other means than that shown, but the method shown suits the writer's power pack arrangements best. The resistor marked X is about 15,000 ohms, but may be replaced by a small iron cored choke to reduce the voltage drop through it if desired. The idea of taking the audio feed from between the .1 and .25 meg. resistors is to make sure that no r.f. gets into the audio stages, no r.f. choke is needed. The audio stages in the writer's set is a 6C6 pentode followed by a 2AC, this combination gives more gain than is required, however, so the audio gain control is needed.

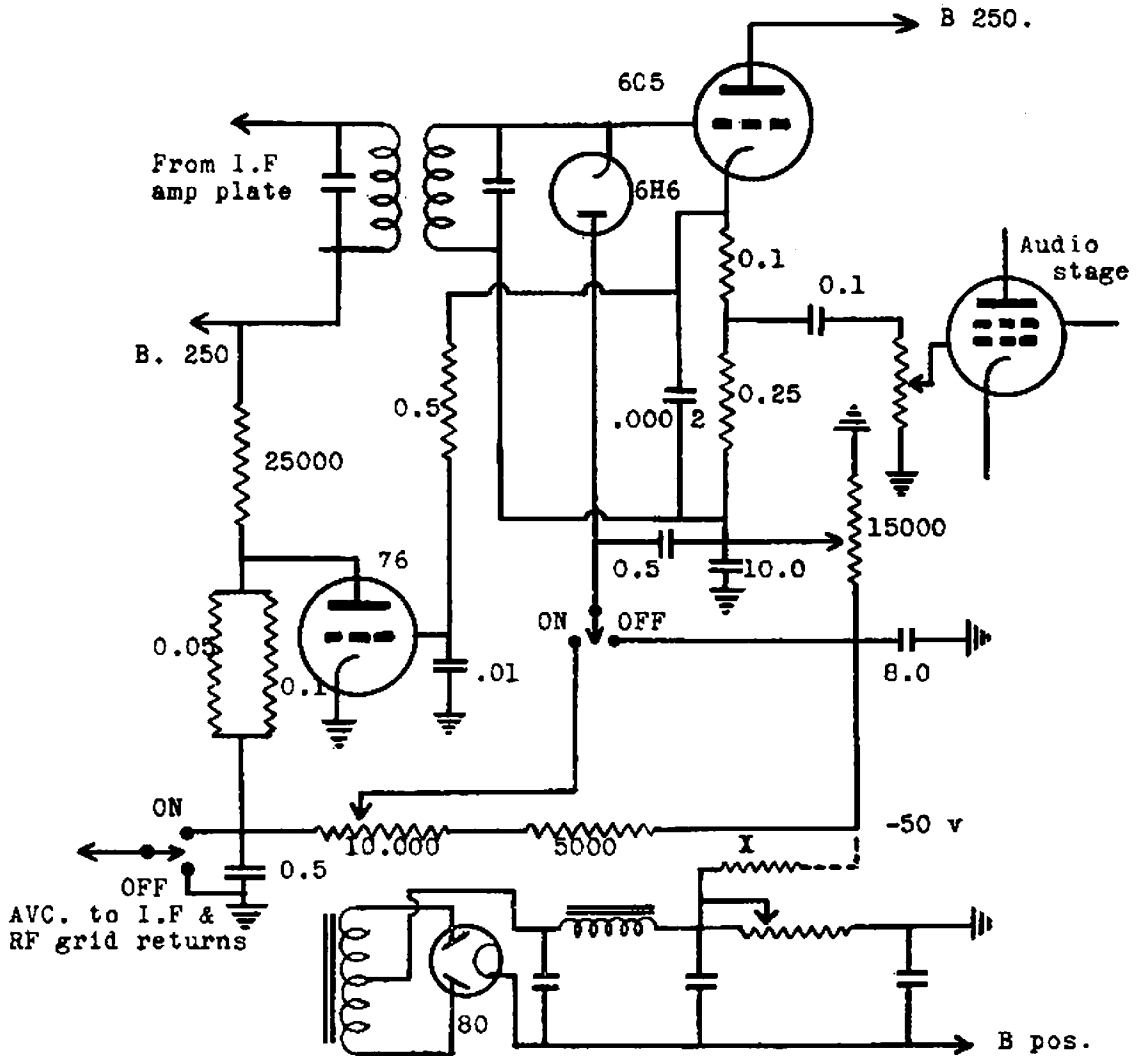
A beat note oscillator may be coupled to grid of 6C5 by twisting an insulated lead from oscillator around the grid lead from sec. of I.F. transformer a sufficient amount to give the desired degree of coupling. It might be thought, on looking at circuit that the .5 mfd. condenser across A.V.C. line is too large, but as the resistance to earth at this point is



much lower than is usual, this is in order. The point that will probably be appreciated with this noise limiter is that once initially adjusted, it is ready for instant use when needed by the flick of the switch, no matter what signal level is being received. In fact, both the potenti-

meters may be mounted at the back of chassis if no room is available on the panel, so it is possible to alter most any multi-tube super. to take this circuit.

And lastly, the writer would like to hear from anyone wanting more details.



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## 15 Watt Modulator To Modulate 30 Watt Carrier

By R. W. Best, ex VX2TY.

Having need of a rather decent amplifier for use for P.A. work, and also with an eye to the future for a modulator, the following circuit was evolved. After some experimenting (which after all is the essence of our existence) the amplifier was at last ready for use, and fully justified the time spent on its construction. The original circuit had push pull E.L.3 tubes in the final and was quite satisfactory, and is still used in the Public Address amplifiers. Requiring a little more power for use as a

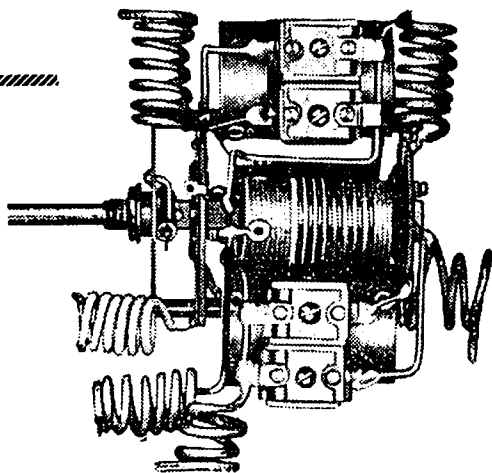
modulator, we hunted up dope on numerous tubes in the Continental range. The only other worth-while tube available was the E.L.5, which seemed quite a reasonable proposition until we turned to the 6L6. The 6L6 offered numerous advantages, the main one being its adaptability to Class B or AB, and so it was chosen. Another big point in its favor was its R.F. characteristics, which naturally appealed on the score of economy of surplus tubes. In using the 6H6, the glass version was

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chosen owing to the lack of trouble experienced with this tube as against its metal prototype.

So much for the output stage. The driver stages could quite easily be metal tubes, such as the 6N7, to replace the 6A6 and the 6C5 to replace the 75. The glass tubes were used here because it was found that we already possessed them. Actually the tubes used are 75 — 53 — 2/6L6-G's, but the 53 serves the same purpose.

The microphone first used was a D104 xtal and gave excellent results, but the price was just a little too much for the bank roll. Examination of the microphones procurable showed a little job with possibilities, the Regal Double Button Carbon, which proved to be all that was necessary for our requirements.

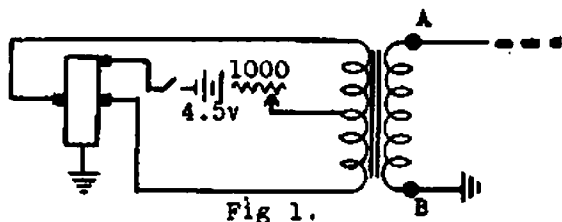


Fig 1.

The pick-up, which is seldom used, is a B.T.H. Senior. The B.T.H. Junior works quite well, and could quite easily be used. If the ham is mechanically-minded, the best proposition is to buy a xtal cartridge and make your own tone arm. The main requirements are balance, minimum weight and freedom of rotation.

The modulation transformer should be made to match Class A 6L6 valves to the Primary and whatever secondary impedance is required. The

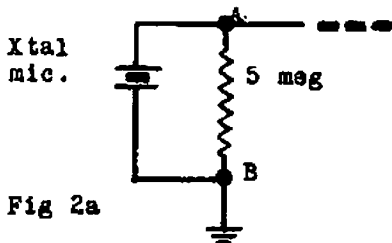


Fig 2a

nett trade price should be between 15/- and £1.

The potentiometer used in the grid circuit of the 6L6 G's is to get correct balance in the amplifier, and in some cases, it may be unnecessary. Nevertheless, its cost is only small and its inclusion is recommended. The tone control was originally installed to help in the overcoming of feedback with the xtal mike whe nused as a P.A. equipment. To obtain best results, I would suggest that it be included.

Although it may seem unnecessary to couple the pickup into the pre-amplifier, I would point out that the gain in the 6A6 is not terrific, and even should the 75 give too much gain, the volume control on the pick-up may be used to limit the input to the grid of this tube.

The original chassis measured only 12 in. x 7 in. x 3 in., but I think a better size would be about 15 in. x 8 in. x 3 in. This chassis also holds the power supply.

Should this modulator be mounted in a rack, as is often the case, together with the rest of the rig, care should be exercised in the placement of the various sections of the rig.

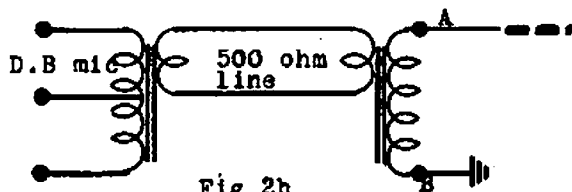
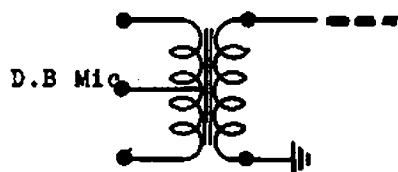


Fig 2b

It seems to be the general rule to mount the power supplies on the bottom, and to put the modulator in the next shelf. If this is done, shielding of the power supply will probably



## Contest Notes

R. E. Jones, KB3RJ, Federal Contest Manager.

### 80 METRE FONE CONTEST.

The contest committee and the N.Z.A.R.T. are gratified at the splendid activity and great interest shown in this contest. Ten VK logs were submitted in the Unlimited Section and seven logs in the Limited section, and included entries from all divisions excepting VK7. Results of the contest will be announced by the N.Z.A.R.T. in due course.

### D.A.S.D. CONTEST.

The VK Contest Committee cast longing eyes on the month of August, 1939, intending to push the VK-ZL 160 metre test and the VK all-band contest into that month, as it was expected in view of the international situation it would be highly improbable that the D.A.S.D. would stage

their annual DX contest this year. However, somewhat belatedly the rules of the German contest came to hand, and there was nothing else to do but to reserve August for them. Look how they treated us—their own contest became a wash-out and we lost our own contest entirely.

### FEDERAL AND VICTORIAN Q.S.L. BUREAU.

R. E. Jones, VK3RJ QSL Manager.

The enforced period of inactivity should enable all hams to catch up with their qsl. Cards can be forwarded to all non-enemy countries at the usual Bureau rates and with the usual promptitude.

The address of the Manchukuo QSL Bureau is:—MX3H, Box 30, Shinkyō, Manchu-Kuo.

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— IN —

## Eddystone Short-Wave Components

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Keep the game going, gang!

**R. H. CUNNINGHAM, VK3ML**

Visitors to Melbourne during September were VK3KS and VK3XB. Both were in the pink. Fritz Haas, ex UO1FH, well known to DX hams of 1928/1932, also dropped in whilst en route from VK2 to Adelaide. Fritz has been in VK for nearly a year and intends to stay put in this country.

The following VK3 stations should now be able to find time and postage to send for their cards, which are languishing at this Bureau, 23 Landale Street, Box Hill.

3AC, AE, AP, AS, AX, AY, BD, BE, BF, BG, BH, BK, BN, BS, BV, CA, CH, CQ, CU, DI, DJ, DS, DU, EF, EH, EI, EL, ES, EU, EV, EW, EZ, FA, FG, FW, GB, GD, GE, GP, GR, GU, GX, HI, HV, IA, IB, ID, IE, IF, IM, IP,

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The enforced inactivity falls especially heavy on Ted Jenkins, VK 3QK. Ted is moving for the summer to Churchill Island, just near Phillip Island in Westernport, and had built up a nice portable for use down there. A brand new steel tower, with a 3 element rotary beam at his Elwood QRA has to wait until "apris la guerre finish" for its initial try out.



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## 28-56 MC Notes

A. Pritchard, VK3CP.

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Well, chaps, another month has passed, and doesn't it make the heart of the ham sad! — especially with such wonderful conditions as we are having at present on ten; five is very dead, still it is worth watching in the hope of sigs from the States. Considering the very good strength of London on 16 metres at 10 p.m. these nights, we would probably be hearing the Europeans at the accustomed time of 7 p.m. if any were lucky enough to be still on ten. I would like to thank the lads for that dope on receiver-antenna experiments—still hoping, hi. VK3YT, of Ballarat, was here in Melbourne a few weeks back and had a few qso's on 'phone (P.M.G. variety!). Alan informed me he was getting real efficiency on 56 mc with his xtal controlled rig, still it will keep and the receiver is now being put through its paces. 3BQ has finished the experiments with his double converting super, and has now built his idea in permanently. The signal is amplified at ten metres with the 1851, then converted to 1500 KC in the 1st det., next converted to 500 KC and amplified with another stage at that freq. then detected in the usual 2nd det. The 2nd converter stage with the 2000 KC xtal osc., now has a single tube, i.e., a Phillip EK2 combination osc-amps type. This xtal freq of 2000 KC could be altered to a freq having its harmonics just a few KC's out from the low edge of the ham bands, say 2332 KC and by not shielding this oscillator, a beat on 6996 KC's would give the 40 mx band just 4 KC's higher, and so on, an excellent marker, always on the job. The circuit constants on the 2nd det. here in use at CP may be of value for the chaps thinking of putting in an R meter. I use a type 53, but the 6V equivalent, 6A6 and .....N7, give the same results. The tube, being a twin triode, one section is used as an anode beam det. and the other as the beat osc. As the tube has a common

cathode for the two sections, care must be exercised with the amount of current used in the osc section, when switched in, otherwise this extra current flowing through the cathode bias resistor produces far too much bias for correct anode-bend det. action. I use just under a meg. i.e., 760,000 ohms for dropping the voltage in the osc plate circuit, and this limits its current to only one-tenth of a mill. and the tube oscillates perfectly at this very low current, the circuit being shunt fed Hartley. The values of the detecting section are: 30,000 ohms cathode bias resistor, with a .5 mf cond. across same, a 100,000 ohm plate load resistor with a 10,000 ohm de-coupling. This gives a standing current of .2 ma., and on each sig. rises providing the I.F. gain is set near the full on position (but not using any regeneration, 2 stages of 465 KC IF). The majority of sigs put the needle up to .7, but many put the needle off scale, W6POZ and W6NKF for instance, often hit .9 with the RF stage screen regeneration control turned off, and this stage when off reduces a .9 signal back to .3 — a meter with a 1.5 mill scale would be ideal, as this is near saturation for this tube in this position. The figures as they stand make an ideal R scale, which compares very favourably with the HRO scale. The hiss cycles, due to heavy ionization, caused by Aurora displays, were putting the R meter up to the 1 ma. on 1st October at 9.30 a.m. The band was absolutely alive and packed full of sigs until 9.20 a.m., when they all disappeared to be followed by this terrific hiss. Talking with 3BQ at the time over the phone, we could hear the rise and fall of the hiss from the speakers, and the intensity of the cycles were perfectly in step. The band gradually came back to life with faint signals half an hour later. The States are at their best around 8 a.m. at present, with the cw portion showing plenty of life. vy 73.

## Short Wave Notes

By M. Campbell, ex VK3MR.

Even now we are speaking about the days when we were on the air, and as I gaze at the pointers heavily leaning against their zero posts in the meters in the rig, I think back, and sigh. They WERE the good old days. Hams are still doing their bit, even in war time, and according to pre-war VK3CX, the boys in the R.A.A.F. come from all States and it's like one big ham convention. We can find plenty of time to study radio seriously now, and learn something about the more complicated theory which we were apt to pass over before. I must plead guilty to neglecting the ham bands in favour of the overseas propaganda, and can recommend some good code practice on DLN just lower in frequency than the 16mx stations. He uses ICW and his speed depends on the importance of the news, and varies from 16 w.p.m. for extra special news to 22 up to 30 for lesser stuff. The good sending to some extent, overcomes the weakness of the propaganda. There doesn't seem to be very much to break through more easily to the PK's and neighbouring countries with no qrm from VK's trying to "take" them off on fone! Much regret, however, is expressed by our pals in U.S.A., but we have the satisfaction to know that we were at least missed from the band! The band is not so easy to locate now, and while searching for it the other day, I automatically went over to switch on the CO to check the receiver, when something seemed to say, "you can't do that there here!" It's an empty world, although there is a position open as traffic manager for the W.I.A., the only qualification needed is to be able to copy the keying of VK2VN. By the way, Morry, don't you owe me a letter? Re countries. Our Mister Brown, 3CX, has come to light with 137 countries worked. He lives for new countries, and in between collects postage stamps, and is particularly interested in air mail stamps, and would like to hear from others that way inclined. This stamp racket is spreading, as 3BM has fallen, too.

Latest list available for most countries worked is as follows: 3CX, 137; 2DG, 122; 3MR, 121; 3KX, 112; 2HZ, 101; 3HG, 99; 4JP, 94; 3BM, 67; 2AHM, 63; and 3XB, 61. The last two use about 4 watts. I am interested to know how some of the old timers in VK4/5 have fared, and also 2ADE, who has taken the lead in the contest, world, closely followed by 2DG. It would be also interesting to know how many contests you two chaps have won. What about it? Send in your list of countries worked while we have the chance to compile a stable list. (Very appropriate in view of the Melbourne Racing Season.—Ed.). It may interest someone to know that I have been working on an entirely new type of monitor for checking the tone of signals. As soon as all patent rights have been adjusted, full particulars will be given. It works on the principle of colour as produced by the modulation in the carrier, and has a very decided variety of colours for different notes. The best type of T9 signal appears as pure white, and varies down the spectrum to a dull brown for heavily modulated notes. One interesting point is that this monitor can be more capably handled by YL's, as colour blindness rarely, if at all, exists in women, whereas about 15 per cent. of the male species are colour blind. More later.

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## Divisional Notes

### IMPORTANT.

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceeding publication.

#### N.S.W. DIVISIONAL NOTES.

President: H. F. Peterson, 2HP.

Vice-Presidents: W. G. Ryan, VK 2TI and F. Carruthers, VK2PF.

Secretary: C. Horne, VK2AIK.

Treasurer: H. Ackling, VK2PX.

Interstate visitors should telephone FX3305.

The September general meeting of the Institute was the first held since the outbreak of war, and it is quite safe to say that the attendance was the largest for some considerable time. The chairman, in his opening remarks, gave details of steps taken by Council since the outbreak of hostilities to place the resources of the Division at the disposal of the Defence Authorities, the principal of which being an offer to train a body of Telegraphists to a standard necessary for service in any Arm of the Defence Forces. Letters of appreciation of this offer was read from the Minister for Defence and the Commanding Officers of the First and Second Division Signal Sections. A communication was also addressed to the Senior Radio Inspector asking that present licencees be allowed to retain their Call signs, and an acknowledgment has been received granting this request, and a further communication states that Experimenters will be given credit for the unexpired portion of their licence when applying for a Broadcast Listeners' Licence. The meeting unanimously endorsed all actions of Council.

It was decided that a time would be set aside at general meetings for the discussion of Ultra High Frequency topics, and Mr. Ross Treharne, VK2IQ, was elected to the position of Director of U.H.F. Activities, the Chairman of the U.H.F. Section, VK2NO, having previously intimated that pressure of business would preclude him from accepting that position.

Meeting agreed that all Members on Service should be made Honorary Members for the duration or period of service, and that a Comforts Fund be organised as soon as possible.

Quite a number of the Institute Members of the R.A.A.F.W.R., were present, and were given a hearty welcome by all present.

An interesting lecture was delivered by Mr. Jack Fraser, VK2AFJ, on "Vacuum Tube Amplifiers," and was well received by members, who commended him on filling the breach at very short notice. 2AFJ has the real Amateur Spirit, and whilst we have members with his spirit and enthusiasm, the Institute will continue to forge ahead.

Council meetings have been slightly disorganised since the outbreak of war, due to several resignations of members who are at present unable to be in regular attendance due to Emergency Services. Messrs. Bennett, 2VA, and Moore, 2HZ, have tendered their resignation and Council were loath to lose their services, but their action in making way for others, who at present are free to attend, is to be commended.

Mr. Ross Teharne, VK2IQ, has been elected to one vacancy and the other will be filled at a later date.

Any member serving in any of the Defence Arms is asked to communicate with the Secretary and give details of his unit, together with the calls of any other "ham" that he may know of. (See Amateur Radio Register.—Ed.). Also it is of the utmost importance that members keep the Division informed of any changes of address as due to the non-publication of the monthly supplement, it will not be difficult to lose track of some members.

Let every Division of the Institute make their watchword the same as VK2—"Carry On."

*"IF IT'S TRIMAX IT'S GOOD"*

# *Just a Reminder!*

Some of our transformer customers have been surprised that we manufacture steel chasses and cabinets — and some of our sheet metal customers didn't know, until recently, that we make transformers.

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**WAVERLEY RADIO CLUB NOTES.**

By F.A.B.

Despite troubled waters elsewhere, affairs at the above club have gone on smoothly during the last month.

On the 26th September, a demonstration of hi-fi amplifiers was given. Amplifiers were brought along by Ted Rodgers and Dev. Dunn. Ted relied on a large horn with a 3 foot flare in front of his speaker to give him his low notes, while Dev used an ordinary baffle. Honours were equally divided for what one gave in low notes the other made up in highs. The amplifiers were finally checked with an oscilloscope.

I must be forgiven if I digress a little here. At a former amplifier night, some years ago, arrangements were made to compare the results obtainable with transformers and resistance coupling. Several amplifiers were placed behind a screen, and the audience, after hearing each, were asked to vote on which they considered was the best. The experts to this day are trying to explain why the bulk of the votes went to one using small "Junk" transformers.

Arrangements are being made for another picnic to National Park. The previous one was to have been held on September 3rd, and was of necessity cancelled. This time unworried by cranky transmitters and the like, we should have an opportunity to really enjoy the beauties of the scenery.

I would like to invite anyone interested in radio to meet the hams of yesterday in the Clubrooms, rear of "Almont," 13 Macpherson Street, Waverley, on any Tuesday night. They are assured of a pleasant evening.

**AMATEUR RADIO NOTES.  
VK4 DIVISION.**

By VK4LT.

Friday evening, September 29th saw the monthly meeting of the Q'ld. Division of the W.I.A. at Ye Olde Head Quarters, George Street.

Mr. A. Walz, VK4AW presided.

As the old saying goes, "It's an ill wind that blows nobody good," so the war had its compensations, for we were treated to a show of old faces, some rarely seen at H.Q.

VK4's were present: AW, ZU, UL, VJ, JP, DY, HR, KF, WL, RC, JF, HU, ES, LT, SN, DM, WT, RT, UU, FB, FJ, WB, UR.

After a lengthy debate on the international situation between members, all ganged up and a few bedtime stories (or were they) were told. The meeting started at 8 p.m., more or less.

When things got organised properly, and members made themselves properly comfortable the meeting was commenced. It proved a great success, and as the subject under discussion was the future of the W.I.A., members were serious for once in their lives, and great enthusiasm was shown by all with regards to carry-in on.

It was decided unanimously to "carry on as usual," holding our usual monthly meeting, and lectures are to be arranged for each night.

The meeting was then concluded and VK4KF gave a very interesting lecture on A.C. Motors, which was absorbed by all Members.

Showing the keenness of our country hams, VK4SN, Frank, from the one ham town of Goomburra, travelled 3½ hours per his car to attend the meeting, and he assured us that the Warwick and District boys were keen to keep the W.I.A. operating, War or no War. F.B. boys, and very glad to hear same.

Then refreshments were to be served "gratis," but alas the cupboard key was not to be found, so most of the gang gathered in "Joes" and held quite a social gathering till the party broke up about 11.30 p.m.

So notes from VK4 Division will be forthcoming as long as AR continues, and I've got 2d. for a stamp.

Any notes, Radio or otherwise, regarding Hams will be appreciated by the New Publicity Scribe.

**HAM NOTES.**

VK4ZU. — Howard, now off Hi. Freq. and in the Low Freq. with Wireless Div. of Militia.

VK4HR—Tibby will sell out for £100. (On the lay-by—Editor). What offers?

VK4FB—Behind the scenes, building a 7 or 8 Tube Super to combat the after war QRM.

VK4SN—Frank has a 4 section 8JK just installed working overtime as a trapeze for Magpies.

VK4ES.—Herb. being married this month—poor Sap—and going up to the old home town for celebrations. Best luck, Herb.

VK4VJ.—Vince only complaint was the apprentices from shop were all going away to the Camps.

# Royal Australian Air Force

---

## VACANCIES FOR WIRELESS OPERATORS

Applications will be received from amateurs in all States.

Details of enlistment from the Secretary, Air Board, or  
W.I.A. Divisional Headquarters.

Apply at once by mailing the form below.

---

The Secretary,  
Air Board,  
Victoria Barracks,  
MELBOURNE, S.C. I

I wish to enlist in the Royal Australian Air Force as a Wireless Operator. My age is..... years\*, I hold the A.O.P.C. and can send and receive at.....w.p.m.\* I am available for immediate war service.

Signed.....

Address.....

.....

Date.....

\*Age limits are 18 to 35 years and minimum operating speed is 16 w.p.m.

NOTE 1.—Enclose separate sheet giving full details of qualifications, etc.

NOTE 2.—Persons who do not possess the above qualifications, but who are desirous of enlisting for training as wireless operators may do so by applying to the above address stating full particulars.

VK4RT.—Johnnie, our late secretary, sat back and enjoyed proceedings.

VK4RY.—Bill having holidays in Sydney.

VK4WT.—Old Bill has been called up for the Air Force.

VK4HU.—George, also a Military guy now. Member of the Signal Corps.

VK4DM.—Dave still manages to talk Radio and had a good rag-chew with 4SN at meeting.

VK4AW. — Arthur still keeping things organised for W.I.A. VK4 Division.

VK4KE.—Keith said he had no notes for his lecture on A.C. Motors at meeting, but we guess he doesn't need any after that lecture.

VK4LT.—This poor sap started up a 10 Tube Super. the day our licences were suspended, so the B.C. Stations get worked overtime on it. Also a Member Wireless Section, Sig. Corps.

VK4CJ.—Poor Cedric, transferred to VK8HI.

VK4UU.—Bill now has no QSL cards to play with. Guess Motor Bike gets more attention.

#### S.A. DIVISION NOTES.

Ex VK5RM.

Towards the end of last month, a code speed test was held. The test was held under examination conditions by Mr. De Cure, who very kindly came along and tested everybody's speed, and also gave us a great deal of valuable advice on how to handle a key and improve our sending generally. The average speed was about 18 words per minute, and the maximum speed was 28 words per minute, one member passing this section. The tests started at 12 words per minute and ended up at 28 w.p.m., and it is hoped to repeat them at regular intervals, with a view to keeping a check on each person's progress.

A number of members have decided to sit for the Class B examination at the end of the year, to see if they can get the B Class certificate.

Now that there is no more DX to work, and no more skeds to keep, and therefore no earthly reason for staying at home, the meetings are becoming very popular indeed. Wednesday evenings appear to be more popular than Friday evenings, and there is usually a crowd on these nights. Some of the members of the student classes, who have been suc-

cessful in their A.O.C.P. exam., will now join the advanced class, and this should swell the crowd.

Quite a number of hams from South Australia, who were members of the R.A.A.F. wireless reserve have gone over to Melbourne for a month's training. It is reported, however, that still more are required for the scheme, and more applications are needed.

There have been no technical lectures for the past two months, but it is hoped to continue them later. In the meantime, the code classes will continue as usual, and we will probably have a test during the second week of November, if it can be arranged. The date will probably be November 10th, but this has not yet been fixed definitely.

#### WESTERN AUSTRALIAN DIVISION.

By VK6WZ.

There is a strong resolve in W.A. to keep the W.I.A. going and to hold the members together. In the absence of the friendly contact per ether we must do something, and the first moves by this Division have been the decision to hold an extra "meeting" or informal evening each month, and the move to make permanent the series of television lectures to be given by 6GM. These lectures will cover the principles of television, and in order that country members shall share in the scheme, and all members be supplied with permanent records of the course for future reference, the monthly letter to members will in future be enlarged to carry instalments of this course.

A ladies' auxiliary is to be formed from among lady members, YL's and XYL's to assist the newly-formed Activities Committee in its work of running the extra monthly get-togethers. There will be no transaction of formal business at these evenings, and their form will be elastic enough to embrace all sorts of entertainments, lecturettes, outings, and "rag-chews." We have hopes of a special show for the November evening, which will introduce the idea. Mr. Hayman, of the Technical College, a patron of the Division and a firm supporter of our cause, has promised an interesting and enlightening evening for members and their friends. If his other commitments allow, he'll supply us with our November show. Further dope forthcoming in time for the November

general meeting and circular. The social evenings are fixed for the fourth Tuesday in each month and the W.I.A. calendar now reads:—

- 1st Tuesday—Council.
- 2nd Tuesday—General.
- 3rd Tuesday—Activities Committee
- 4th Tuesday—Social Evening.

Members of the Division attached to the various defence arms and either called up or likely to be include:—6CC, 6IG, 6TM, 6AF, and 6ZX. The position of others, including a number of country chaps, is unknown. (See Amateur Radio Register.—Ed.).

Several members have taken an interest in talkie projection, and it's likely this disease will spread. 6CC was observed at the October meeting brandishing a camera tripod. 6EL

and 6WH admit interest in celluloid sound. 6BB still interested in high-speed film for taking snaps at the movies and also blowing the dust off the talking-light-beam gear. 6GB has been promoted to the ranks of broadcast ops. and is slowly fading away as a victim of "needle-watcher's neurosis." 6BW is planting out 913's under glass in the hope they'll grow 9-inch screens. Threatens to take up wired television. 6YZ talks of trading-in the piano-accordion on a B/C set; don't do it, Dick—the programmes are lousy, anyway! 6EC and others seem interested in home-recording, and we might have some lectures on that topic before long. The only country news comes from 6FL, who is busy with p.a. work, and is doing Daventry pick-ups for a local station.

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# AMATEUR RADIO



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PRICE

6<sup>d</sup>

DECEMBER, 1939

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## OUR ORGANISATION

### *Publishers.—*

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### *Editorial Department.—*

W. R. GRONOW (VK3WG),  
Editor.

R. H. CUNNINGHAM (VK3ML)  
Technical Editor.

C. SERLE (VK3RX)  
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V. E. MARSHALL (VK3UK)  
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L. T. POWERS (VK3PS)  
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### *Advertising Department.—*

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129 William Street, Melbourne.  
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Sydney Representative—

J. H. FRASER

8 Deakin Avenue, Haberfield. UA 1725.

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### *Printers.—*

H. HEARNE & CO. PTY. LTD.,  
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### *Accounts Department.—*

LARGE & POWERS,  
Chartered Accountants (Aust.),  
422 Collins Street, Melbourne.

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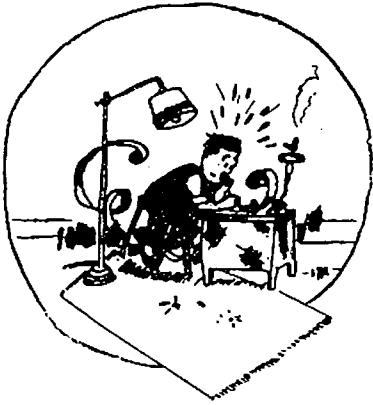
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# EDITORIAL



## "W.I.A. WAR BULLETIN."

Here is the news!

### **Federal Executive applies to P.M.G. Dept. for U.H.F. allocation.**

After discussion with Chief Inspector, Wireless F.H.Q. has made formal application for re-issue of experimental licenses throughout Australia, for frequencies of 112 MC and above—Power limit 25 watts.

### **Non-members of W.I.A. endorse action to restore licenses.**

Realising value of Institute as representative Amateur Body, non-members wholeheartedly support Institute's action to obtain re-issue of Experimental Licenses.

### **N.S.W. Division propose 5 metre relay.**

...Stations every 30 miles to provide Interstate relay for emergency communications has been mooted by Sydney H.Q.

### **S.A. Division running Commercial Classes as well as A.O.C.P.**

For details see Divisional Notes. Classes enthusiastically supported by P.M.G.'s Dept.

### **Unofficial Report from Air Force Officials lauds amateurs in R.A.A.F.**

High praise for the efficiency of Members of the Air Force Wireless Reserve, who have been called up, has been given from all States.

Every man, without exception, was able to go straight onto handling traffic without further training, and nothing but praise for their efficiency has been heard from all quarters.

### **Institute's National Survey will be Permanent Record of Amateur's Worth.**

A survey of amateur's serving in the Army, Navy and Air Force, is being made in all States and will form a valuable record of the amateur's part in war time. Don't neglect to fill in and return YOUR form.

### **Navy makes bid for Amateur's Services.**

The Secretary of the Naval Board has asked us to let members know that applications are invited from all amateur operators, who can do 20 w.p.m., to join Navy.

### **Work of Hams in Services shows need for universal traffic handling after War.**

If traffic handling had been permitted before the war, we should not have to chronicle the case of one ham who could copy 25 w.p.m. in his head, but could only write down 10 w.p.m. accurately when tested on enlistment.

### **Reduced subs and Xmas Hampers for hams on Active Service.**

N.S.W. Headquarters are discussing plans to provide hampers at Xmas to hams with the three services. Most Divisions are promoting a move to reduce subscriptions for these members when they are on active service.

**Merry Xmas to all our readers, and our sincere thanks to all contributors for their support during the year.**

# A Review of Radio Receivers

By Courtesy of the Amalgamated Wireless Valve Co. Pty. Ltd.

**(H) Volume Control.**—The function of a volume control, or more correctly "gain control" is to vary the overall gain of a receiver to produce the required output from different input signals. A volume control should satisfy two important requirements. Firstly it should be in a position such that there is no possibility of overloading the earlier stages. Secondly that it should reduce as quickly as possible the background noise in the receiver.

One of the earliest forms of control was a rheostat in series with some of the filaments. This is not used to-day because of distortion as well as the time delay as filaments heat up or cool down. It is of course out of the question with indirectly heated types.

Following the introduction of tetrode and pentode valves, some attempts were made to use variable screen voltage, but although satisfactory in the receivers to which it was applied, the range of control is insufficient for more sensitive receivers. The screen grid, having a sharp cut-off characteristic, is critical in setting at low screen voltages. Again any attempt to secure large voltage outputs at such settings introduces considerable distortion.

Modern practice is almost without exception to control gain by means of control grid bias, as applied to variable-mu or super-control valves. With sharp cut-off valves such as 24A, 57, 6C6, 32 and 1K4 the gain can be controlled to a certain extent, but once the bias has reached a certain critical value distortion rises rapidly and renders further control

useless. With variable-mu valves such as the 35, 6D6, etc., the grid is so designed that the mutual conductance (which governs the gain) slowly decreases with increasing bias, and allows the valve even to attenuate without serious distortion.

In a normal pentode valve, increasing the grid bias tends to decrease screen (and plate) current. If the screen supply is badly regulated, as would occur with a single series feed resistor, the screen voltage rises as the control grid bias is increased, and tends to lengthen the cut-off characteristic. This effect has at times been used to control the gain of a sharp cut-off valve, and is sometimes used in the I.F. stages of receivers having at least two other controlled stages. With a variable mu-valve it is normally undesirable to increase further the already substantial cut-off bias which is required, and the screen supply should be reasonably well regulated. Normal practice is to use a 25,000 ohm voltage divider across the high tension supply.

The screen current of a pentagrid converter remains fairly constant with varying bias, and if supplied in parallel with other screens exerts a useful stabilising influence.

The foregoing remarks apply of course whether the bias is applied directly to the grid, or through a variable cathode bias resistor.

**(I) Automatic Volume Control (A.V.C.).**—A.V.C. is a circuit arrangement which reduces the gain of the receiver in proportion as the strength of the income signal increases. The result is to cause all stations to be heard at about the same volume. The majority of A.V.C. circuits depend for their operation upon a diode rectifier.

Figure 4 shows a simple diode detector arranged to provide, in addition to detection, A.V.C. voltages. When a carrier is tuned in alternating voltages at intermediate frequency appear across the secondary of the I.F. transformer. Each time

that the diode plate swings to a positive peak a flow of current occurs through the diode, the secondary of the intermediate frequency transformer and resistor R2. The direction of the current is such that each positive swing on the diode plate causes a negative potential to appear at point A. If we connect across R2 a condenser C2 of sufficient capacity, it will exert a storage effect and tend to keep a constant voltage at point A. When the amplitude of the carrier is varied by modulation at a frequency normally much lower than the intermediate frequency, the value of C2 can be so adjusted as to remove practically all the carrier frequency from R2 while still allowing the voltage across it to vary at the modulation frequency. If therefore R2 is a potentiometer connected as shown we can select from the tapping the voltage necessary to excite the audio amplifier. In practice rather more filtering is necessary to remove from the amplifier all traces of high frequency. The presence of high frequency in the audio amplifier is usually manifested as an unusual "liveness" of the speaker lead, or sometimes as a tendency to howl.

We have seen that at point A there is a D.C. voltage dependent on carrier input, but subject to variation at modulation frequencies. If R1 and C1 are connected as shown, and the time constant made sufficiently long, it is possible to obtain at point C an unvarying voltage which can be applied to the grids of the variable-mu valves for purposes of control.

Without entering into too much detail the A.V.C. voltage, for all normal requirements, must be applied to at least two and preferably three stages in the receiver. In a 5 valve receiver without an R.F. stage the bias must therefore be applied to the converter and intermediate frequency amplifier. Where an R.F. stage is available recommended practice is to apply the A.V.C. to all three stages (R.F., converter, and I.F.) on the broadcast band but to the R.F. and I.F. only on short-waves. With a 6K8-G converter operated on specified conditions, A.V.C. may be applied to the converter without introducing trouble due to frequency drift.

From figure 4 and the associated discussion it can be seen that any signal, no matter how weak, will cause

a voltage drop to appear across R2 and a slight negative bias to appear at the grids of the amplifying valves. The receiver therefore tends to lose sensitivity in the presence of a weak signal, or indeed, in the presence of background noise. It is highly desirable therefore to have some delay effect such that the sensitivity of the receiver remains unaltered until signals exceed some pre-determined limit.

If, in figure 4, cathode of the

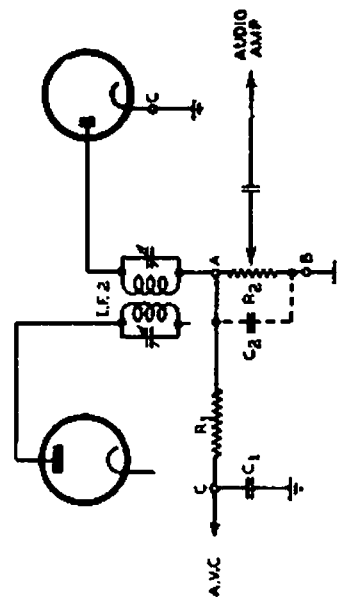


FIG. 4

diode is made positive by say 3 volts in respect to earth, or point B is made negative by the same amount in respect to earth, the desired effect will be had in that no current can flow in the diode circuit till the peak value of the incoming wave exceeds this "delay" voltage. Where, however the same diode is used for detection and A.V.C. as in this diagram, the application of such voltage cripples the detecting action and renders the circuit impracticable. For delayed A.V.C. two diodes are necessary. Where, as is common practice, the diodes are included in the same envelope as a voltage amplifier, the delay may be simply obtained by utilising the voltage drop in the cathode bias resistor. The two to three volts thus obtainable are approximately the optimum delay voltage for average receivers.



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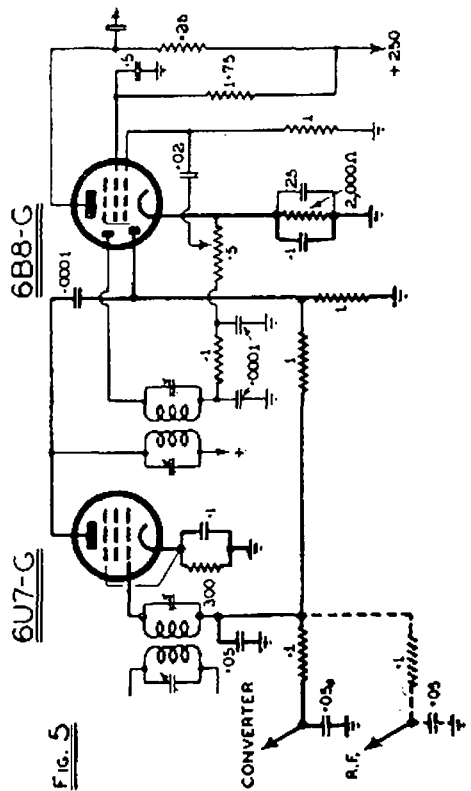
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Figure 5 shows a satisfactory delayed A.V.C. system.

An important feature of A.V.C. systems is the time constant, or in other words the time taken for the bypass condensers to charge or discharge through the feed resistors. Excessive values of condensers (or resistors) will not allow the receiver to follow fast fading as encountered on the short-wave bands. In addition the receiver tends to be sluggish to handle in that an appreciable time elapses before the receiver recovers full sensitivity after having been tuned to a powerful station. The lower limit is set by two considerations. The first is that the time constant must be long enough so as not to respond to the lowest modulation frequency. Secondly in the majority of circuits the bypass condensers are effectively in series with the tuning capacity across the coil, and small values tend to restrict the tuning range. The values shown in figure 5 are a happy medium between the two requirements.



In figure 5 it will be seen that the A.V.C. diode is fed from the plate of the last intermediate frequency amplifier. This method has two ad-

vantages over the scheme of feeding it from the detector diode. The first is that the available voltage at the plate is higher than at the detector diode, so that the A.V.C. system is improved. The second is that it minimises the shunting effect on the detector diode and hence the distortion caused by such shunting.

Amplified A.V.C. takes two general forms, either a special valve to amplify the signal before rectification or a D.C. amplifier to magnify the actual D.C. bias. Amplified A.V.C. is a highly desirable feature, but is seldom seen in household receivers due to the additional cost involved.

An important point to watch in A.V.C. circuits is that the standing bias on the controlled valves, whether derived in their own cathode circuits or from the A.V.C. return, corresponds to the rated value.

Another important consideration in the effective operation of an A.V.C. system is the regulation of the screen supply, as has already been mentioned in section H. There is one important exception to this general statement. When it is desired to enable the receiver to operate without appreciable distortion on very strong signals the screen of the I.F. amplifier valve may be supplied through a series resistance from the full voltage. When the bias rises on a local station the screen voltage also rises and tends to give the valve a more linear characteristic. This action however materially affects the A.V.C., and the arrangement is not recommended except in cases where there are two other controlled stages having good screen regulation.

When a receiver is fitted with A.V.C. some form of tuning indicator is highly desirable. Many complaints of distortion and harsh tone are directly due to incorrect tuning. Many mechanical devices have been introduced from time to time, generally operated by the change of plate current in one or more of the controlled valves. The majority of receivers nowadays use an electron-ray tuning indicator such as type 6G5 or 6U5. Early samples of these indicators were sometimes unreliable but structural alterations have greatly improved the uniformity and life. Anode supply voltage is not critical, but target supply should never exceed maximum ratings. It is advisable rather, to operate with no more

volts on the target than necessary for adequate brilliance (say 180 to 200 volts).

**(J) Push Button Tuning.**—The latest trend in receiver design is the provision of push-button tuning. The systems employed may be divided into two main classes.

In the first, some form of multi-pole switch disconnects the gang condenser from the aerial and oscillator coils and substitutes one of a number of pre-set trimming condensers. Such an arrangement demands from both coil and condenser extreme stability against mechanical shock and temperature change, if anything like satisfaction is to be had. The oscillator circuit is of course far more important in this respect than the aerial circuit. Early attempts to use conventional bakelite mounted, mica dielectric trimmers almost invariably met with failure. Of late some manufacturers have achieved a measure of success by using carefully designed mica trimmers mounted on trolitul bases and shunted, where necessary, by fixed condensers having low temperature characteristics. Other manufactureres have discarded variable capacity tuning in the oscillator circuit and employ the required number of separate resonant circuits, each one consisting of a small fixed condenser shunted across a variable inductance iron-core coil. Such an arrangement can be made extremely stable if the temperature co-efficients of coil and condenser are arranged to be equal and opposite.

The other general classification refers to systems which, either by a system of levers or a small electric motor, rotate the gang condenser to a predetermined position. Problems which arise are therefore of mechanical nature, although effects of temperature must still be considered in design.

It would appear that in existing systems slight readjustment may be necessary on at least some stations about every six months. The majority of these receivers are accompanied by detailed instructions for adjustment and the job of the serviceman should not be very difficult.

Automatic frequency control has been used in a number of the larger receivers in this country, but such a subject is of a specialised nature and beyond the scope of this present treatment.



## DETECTORS AND AUDIO AMPLIFIERS.

**(A) DETECTORS.**—It is the function of the detector in a receiver to rectify the voltages of carrier frequency developed across the tuned circuits of the R.F. stages, and to pass on to the audio amplifiers the modulation components of the carrier.

One form of detector which was popular in early broadcast receivers was the grid-leak or "leaky grid" type, using a small triode valve as shown in Fig. 1. As the name implies, rectification (or detection) is effected in the grid circuit, in a manner which closely resembles that of the familiar diode detector.

The grid is returned to the cathode, or in the case of a directly heated valve to the positive side of the filament. Under such conditions, a small positive voltage applied to the grid causes a flow of current in the grid circuit. When a carrier is tuned in, an alternating voltage appears across the tuned circuit and is impressed on the grid. As each positive half cycle approaches its peak value, grid current flows through the grid resistor in such a direction as to cause a negative bias to appear on the grid. Since the grid condenser C1, is shunted across R1, it becomes charged by these impulses and tends to maintain on the grid a negative voltage very nearly equal to the peak value of the input voltage. Thus, in the case of a carrier of constant amplitude, there appears at the grid a negative bias, together with a certain amount of rectified carrier voltage. When the carrier is modulated at an audio frequency (at which frequency the storage effect of C1 is very small), the grid voltage consists of the negative bias, an audio voltage component and a certain amount of rectified carrier voltage.

The A.F. and R.F. voltages are amplified by the triode in the normal manner and appear in the plate circuit. The higher frequency voltage is prevented from entering the audio amplifier by the R.F. choke and associated bypass condenser. Radio frequency bypass condensers in such

circuits should be no larger than necessary, since excessive values seriously attenuate the higher modulation frequencies.

By feeding back a proportion of the carrier voltage into the grid circuit (i.e., by "reaction"), it is possible to realise much higher detector sensitivity than would otherwise be possible.

The plate load of a grid-leak detector usually consists of the primary of an audio transformer. Since with weak signals the negative grid bias is very small, the plate supply voltage has to be reduced sufficiently to limit the plate current under such conditions to a safe figure. Excessive plate current may damage the primary winding of the transformer, and/or cause damage to the valve. A supply voltage between 20 and 100 volts is satisfactory for most valves.

The distortion introduced by a grid-leak detector is appreciable in most cases. With small input voltages it is caused by the non-linear relationship of applied grid voltage to grid current. If the input is increased sufficiently to minimise this effect, the bias developed is too great for the valve to amplify high percentages of modulation without distortion.

Grid-leak detectors are now seldom used in modern receivers where detector linearity is of far more consequence than detector sensitivity.

The grid-leak detector has been largely superseded by the anode bend detector, which in its usual form consists of a triode, tetrode or pentode valve, biased almost to plate

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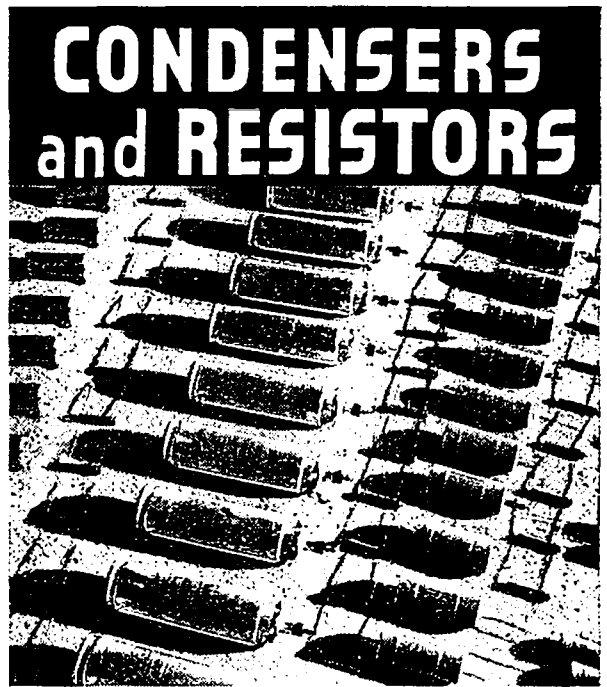
current cut-off ("Lower Bend Detection"). The high bias required is usually obtained by means of a large bias resistor in the cathode circuit, as shown in Fig 2. This bias resistor is bypassed by a condenser of suitable capacitance both for R.F. currents of carrier frequency and A.F. currents of modulation frequencies.

When an alternating voltage is impressed on the grid, each positive half cycle produces an increase in plate current, while little change is produced by the negative half cycle. When the input voltage is an amplitude-modulated carrier, the plate current consists essentially of a series of unidirectional current pulses varying with the modulation depth, and at modulation frequency, together with a D.C. component, the average value of which is dependent on the carrier input voltage. These current pulses produce across the plate load resistor (RL) a series of voltage pulses (at carrier frequency), the peak values of which vary according to the modulation.

The plate bypass condenser C1 provides a low impedance path to the cathode (or filament) circuit for current components of carrier frequency appearing in the plate circuit, and, together with the R.F. choke and second bypass condenser C2, prevents the R.F. components of the plate current from reaching the plate load, so that the voltage developed across the latter varies only at modulation frequencies. In this manner, the modulation components of the carrier appear as audio frequency voltages across the plate load of the detector valve, and may then be applied directly to the audio frequency amplifier.

The gain of an anode bend detector may usually be increased by substituting for the plate load resistor a high inductance audio choke (shown dotted), which offers a high A.C. load impedance but allows a much higher effective plate voltage to be obtained. It is usually desirable to shunt such a choke with a resistor (e.g., .25 megohm) in order to stabilise the A.C. plate loading of the valve, since the impedance of a choke varies with frequency. In normal broadcast receivers it is doubtful whether the use of a choke justifies its cost.

An anode bend detector is capable of handling relatively large signal



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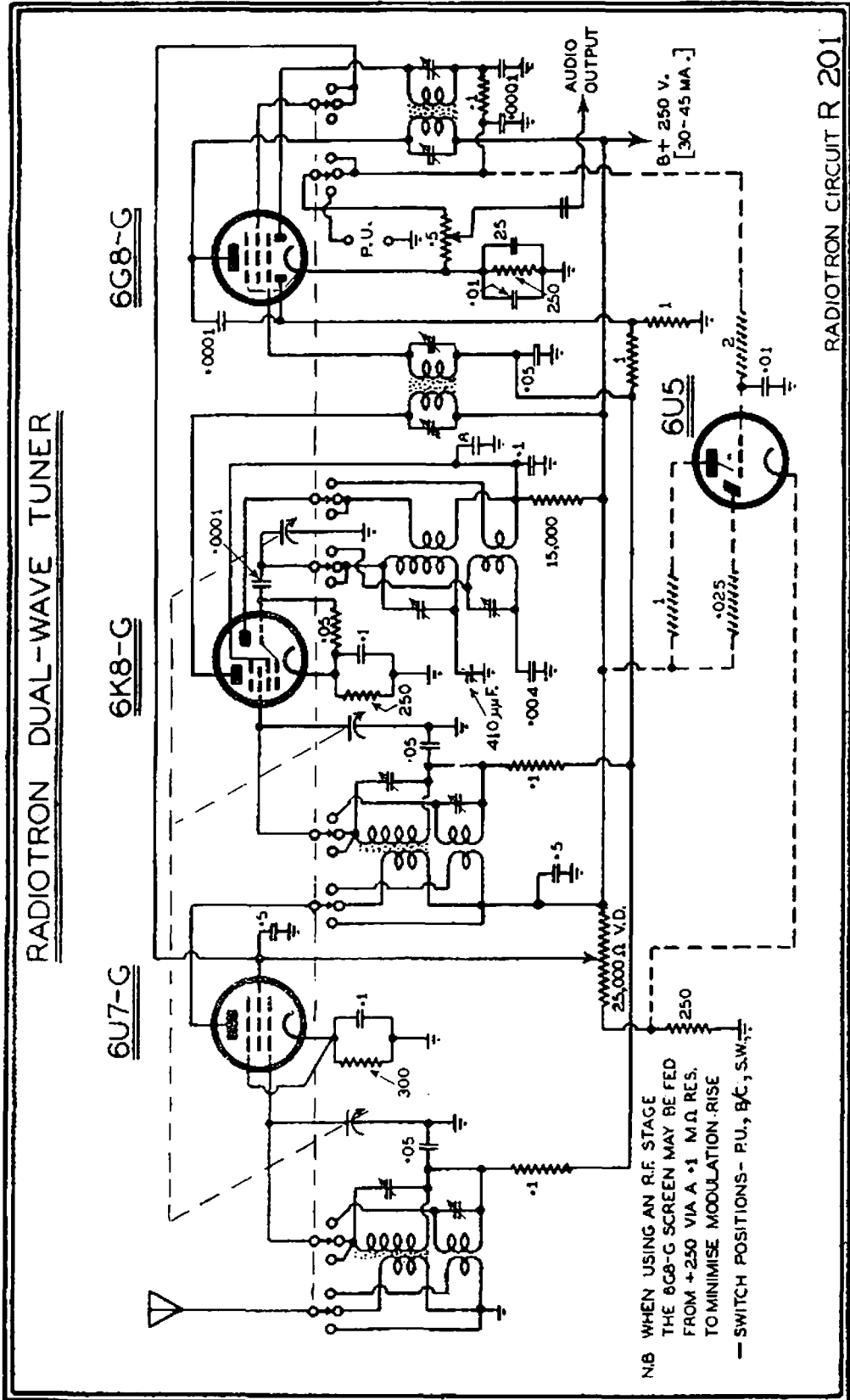
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input voltages and imposes comparatively negligible loading on the input circuit. It can be shown, however, that under average conditions it introduces appreciable distortion, although not necessarily sufficient to debar its use in present-day recei-

vers. The use of this type of detector is also restricted by its inability to provide A.V.C. voltages.

A recent development of the anode bend detector, known as the "Linear Reflex Detector," incorrectly though commonly called the "Infinite Im-



pedance Detector," is worthy of note and will be mentioned more fully in a later lecture.

The majority of modern receivers use diode detectors. This form of detector has already been mentioned in connection with automatic volume control, but some repetition is necessary for the sake of continuity.

Fig 3 shows a simple diode detector circuit. When a carrier is received alternating voltages at intermediate frequency appear across the secondary of the I.F. transformer. Each time the diode plate becomes positive during a positive half cycle, a pulse of current flows through the diode, the secondary of the I.F. transformer and the load resistance R2. The direction of this current is such that during each positive half cycle, a voltage negative with respect to earth, is produced at point A. If we connect a condenser C2, of sufficient capacitance, across R2 it will exert a storage effect and tend to maintain a constant D.C. voltage at point A. When the amplitude of the carrier is varied by modulation at frequencies normally much lower than that on the carrier (or the I.F.), the value of the C2 can be so adjusted as to remove practically all the voltages of carrier frequency from R2, while still allowing the voltages developed across it to vary at modulation frequencies.

In order to obtain sufficient excitation voltage for the output stage, it is usually necessary in practice to incorporate at least one stage of audio amplification between the diode detector and the output valve. When a duo-diode triode or a duo-diode pentode is used, it is possible to obtain (in one valve) detection, first stage amplification and A.V.C. voltage. An alternative scheme is to employ a duo-diode super-control pentode, such as the type 6G8-G (6B7S), and use the pentode section as the last I.F. amplifier. It is then possible to use an efficient pentode, such as type 6J7-G, in the first audio stage and completely isolate the high and low frequency circuits.

Early practice was to connect the grid of the first audio amplifier directly to point A, or in the case of receivers equipped with A.V.C. to a variable tapping on R2. With this arrangement the bias on the first audio amplifier is developed by the

diode across the load resistor (R2), and is therefore of a very variable nature, being dependent on both the carrier strength and the position of the tapping. The valve when operated in this manner is said to be "Diode Biased," and the method is only practicable with a valve having a very low amplification factor (e.g., type 55), being quite unsuitable for high- $\mu$  types.

Normally it is necessary to use a D.C. blocking condenser (C3) followed by a grid resistor (R3). These constitute an A.C. shunt on the D.C. load resistor (R2), and have a very important influence on the operation of the diode. The ratio of the A.C. to the D.C. loading sets a limit to the depth of modulation of a carrier which the diode is able to handle without serious distortion. In a circuit, such as that shown in Fig. 4, the maximum percentage of modulation which can be handled without appreciable distortion is 33%. At the highest modulation frequencies, where the reactance of the R.F. bypass condenser is appreciable, the distortion is even greater. On peaks of modulation the distortion is very serious and figures of up to 30% can be expected.

The arrangement shown in Fig. 5 is representative of good practice in diode circuit design. It will be seen that the A.V.C. network can have little effect on the detector diode, while the shunting effect of the grid resistor is low, since the volume control is seldom used in its maximum position. Measurements show that the effect of the high frequency bypass condensers specified is not serious for percentages of modulation, which can be expected at higher audio frequencies at which the shunting effect is appreciable.

Continued on page 21.

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# Resistance Coupled Amplifiers

By J. H. Fraser, A.M.I.R.E. (Aust.), VK2AFJ.

*The Author discusses the theory of resistance capacity coupling of amplifiers and then goes on to describe the way to go about designing such an amplifier. He concludes with a few practical tips which should be kept in mind when looking for trouble in the finished amplifier.*

## GENERAL.

The design of a resistance capacity coupled amplifier is not complicated, and for average performance the design is not critical, but for those who would wish to extend the frequency range at both the low and high frequency ends of the audio spectrum the information in this article may prove helpful.

This type of amplifier has a characteristic which is well known, namely: the capability of amplifying a wide band of frequencies, but another characteristic is that the amplification falls off at low and high frequencies unless special precautions are taken with the choice of resistance and capacitance values to ensure amplification of that wide band of frequencies.

The falling off in amplification at low frequencies is because of the high reactance of the coupling condenser, whilst at high frequencies it is because the tube and stray capacities tend to have a low reactance and thus lower the effective load impedance of the tube.

## NOTATION AND FORMULAE.

- $R_p$  = plate resistance of the tube.
- $R_c$  = plate coupling resistance for the tube
- $R_g$  = grid resistance for the following tube
- $R_a$  = the value of  $R_p$   $R_c$  and  $R_g$  in parallel
- $R_b$  = the value of  $R_g$  in series with the value of  $R_p$  and  $R_c$  in parallel
- $X_c$  = the reactance of a condenser

$X_{cs}$  = the reactance of the stray capacities

$X_{cc}$  = the reactance of the coupling condenser

$C_c$  = the coupling condenser

$C_s$  = the stray capacities including the output capacity of the amplifier tube and the input capacity of the following tube.

$$\pi = 3.1416$$

f = frequency in cycles per second

$$X_c = \frac{1}{2 \pi f C} \dots \dots \dots \text{eqn (1)}$$

ratio of amplification at high frequencies to amplification at medium frequencies.

$$= \frac{1}{\sqrt{1 + \frac{R_a}{X_{cs}}} \dots \dots \dots \text{eqn (2)}$$

ratio of amplification at low frequencies to amplification at medium frequencies.

$$= \frac{1}{\sqrt{1 + \frac{X_{cc}}{R_b}}} \dots \dots \dots \text{eqn (3)}$$

## THEORY.

Reference to Fig. 1 shows a conventional one stage amplifier. Equivalent circuits of Fig. 1 are shown in Figs. 2a, 2b and 2c. Fig. 2a is the equivalent circuit for studying the amplification at medium frequencies, Fig. 2b is that for the high frequencies, whilst Fig. 2c is the equivalent circuit for the low frequencies.

**AMPLIFICATION AT MEDIUM FREQUENCIES.**—Fig. 2a.—It will be readily realised that the reactance of the coupling condenser  $C_c$  can be neglected at these frequencies and the shunting effect of the stray capacities  $C_s$  can be neglected too, so the effective load resistance is the sum of the three resistances  $R_p$ ,  $R_c$  and  $R_g$  in parallel, i.e.,  $R_a$ . The amplification at medium frequencies will be taken as a reference point.

**AMPLIFICATION AT HIGH FREQUENCIES.**—Fig. 2b.—At high frequencies the reactance of the condenser  $C_c$  can still be neglected, but the shunting effect of the stray capacities begins to be appreciable, and is the more so the higher the frequency. Thus it will be seen that the stray output capacities limit the high frequency response of an amplifier. This leads to RULE 1, viz. :—The amount by

which the amplification falls off at high frequencies is determined by the ratio which the reactance of the shunting capacity bears to the equivalent resistance obtained by combining the plate resistance coupling resistance and grid resistance all in parallel.

**AMPLIFICATION AT LOW FREQUENCIES.**—Fig. 2c.—The effect of the stray capacities on the output can be neglected at low frequencies, but not so the effect of the reactance of the coupling condenser  $C_c$ . At low frequencies this condenser's reactance is so high as to limit the low frequency response considerably. It will be seen from the Fig. 2c that  $R_g$  is now in series with  $C_c$  and the smaller the value of the resistor  $R_g$  the poorer the low frequency response. This leads to RULE 2, viz. :—The amount by which the amplification falls off at low frequen-

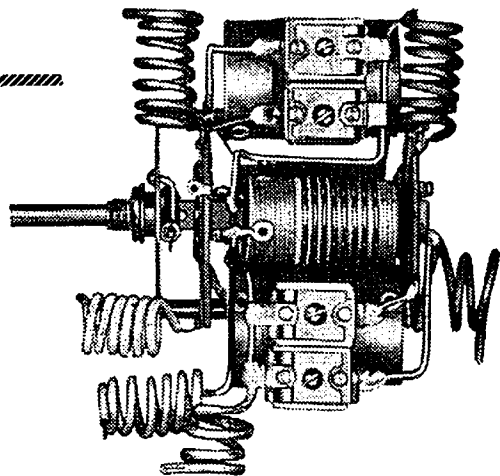
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ies is determined by the ratio of the resistance of the coupling condenser to the equivalent resistance of the grid resistance in series with the parallel combination of the plate resistance and plate coupling resistance.

Equations (2) and (3) are useful for numerically determining the falling off in amplification compared with the amplification at medium frequencies.

100,000 ohms and 500,000 ohms, so that the voltage at the plate of the valve is between 50% and 20% of the available plate supply voltage approximately.

The third step is to choose the values of the GRID RESISTANCE  $R_g$  and COUPLING RESISTANCE  $R_c$  together, on the basis of the desired low frequency response. This leads to RULE 3, viz. :— the greater the numerical value of the

## Internal Plate Resistance $R_p$ .

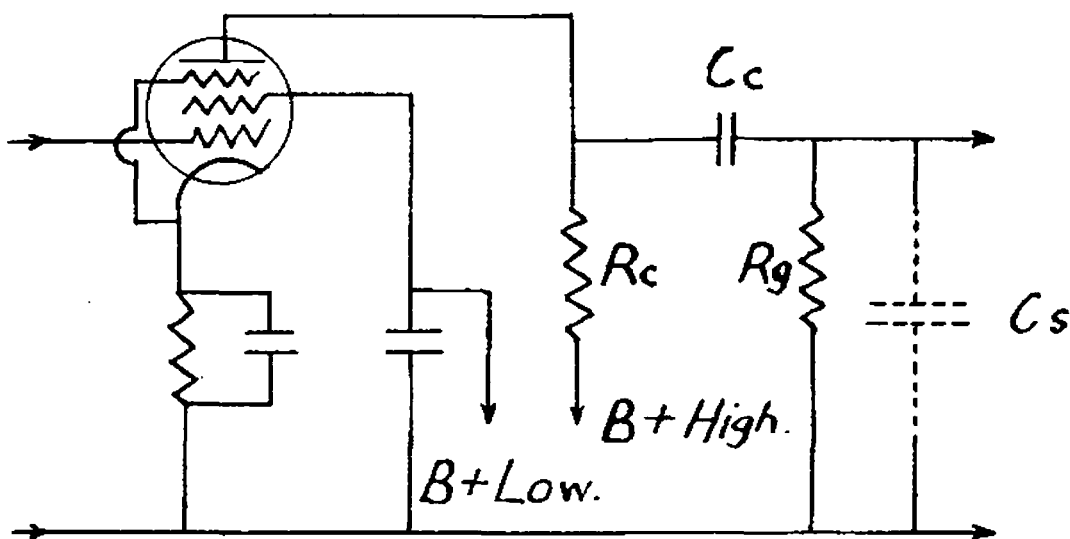


Fig 1.

### STEPS IN DESIGN.

The first thing to choose is a SUITABLE TUBE. Sharp cut-off pentodes are most suitable because they give high gain and a better high frequency response. If triodes are required it is better to use a high- $\mu$  type than a low- $\mu$  type. However care must be taken in ensuring the correct bias for the high- $\mu$  types as a variation in a few tenths-of-a-volt can be quite upsetting in performance.

The second step is the selection of the best value of COUPLING RESISTANCE. If all things were equal the higher the value of the coupling resistance the greater would be the amplification, but increasing the plate coupling resistance reduces the voltage at the plate of the tube. It is usual to choose a value of between

product  $R_g C_c$  the better the low frequency response. However it is better to use the highest value of grid resistance permitted by the tube manufacturer, under the intended operating potentials.

The fourth step is to ESTIMATE the STRAY CAPACITIES  $C_s$ . Work out the reactance their total value has at the desired HIGH frequency and substitute the value in eqn. (2). If the result does not give the desired high frequency response, it will be necessary to REDUCE the value of either or both  $R_p$  and  $R_c$ , until the desired response is obtained.

It was stated earlier, that increasing the value of  $R_c$  improved the gain, thus it will be seen that when  $R_c$  is lowered the gain is reduced. And reduced gain is the price that must be paid for a good response characteristic.

**PRACTICAL HINTS.**

If one desires to use a type 6B7, 6B7S or 6G8G as an audio amplifier in either a receiver or straight amplifier the following procedure should be adopted. Use a 250,000 ohm plate coupling resistance with a power supply voltage of 250. Then apply the following screen and control grid voltages. Use a 1000 volt scale meter for measuring the screen voltage. It is essential that the bias value be adjusted carefully to these values if the GREATEST gain, with the particular screen voltage used, is to be obtained.

Bias	Screen
- 2.5 V	+ 30 V
- 3.2 V	40 V
- 4.6 V	50 V
- 7.8 V	75 V
- 9.3 V	100 V

Fig 2a.

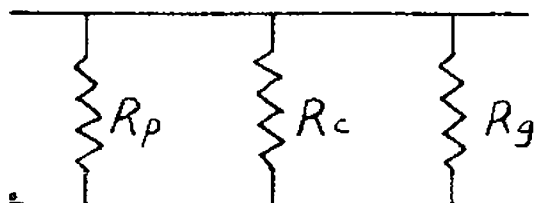


Fig 2b.

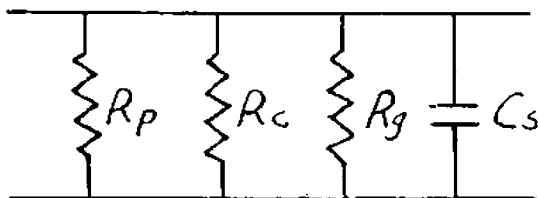
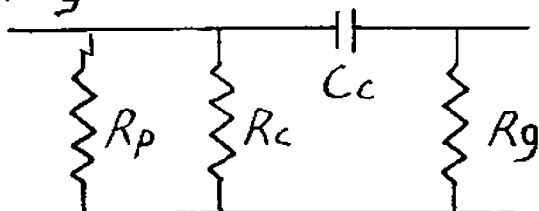


Fig 2c.



Only good paper condensers should be used when extending the low frequency response beyond normal. Paper condensers can be used satisfactorily down to 40 cycles and mica condensers will permit of the frequency range being extended to 5 cycles per second.

It is generally undesirable to extend the low frequency response lower than required. This is because such an improvement is of no benefit, and invites trouble from feedback, arising out of common plate impedances amongst other things.

Make sure that you have the full filament voltage on all the amplifier tubes, especially the power output stages. If you have an amplifier with types 6L6, 6V6 or 6Y6 and can't get the full output, then look to their filament voltage first.

When the amplifier happens to be a high gain outfit, then take special precautions to shield the entire first stage COMPLETELY in a 16 gauge brass shield, both top and bottom, and do not use a steel chassis if there is a power or filament transformer on the same chassis. This will ensure both electrostatic and electro-magnetic shielding. Shield the filament leads as much as possible. The entire chassis should be earthed too.

It is considered bad practice to use carbon resistors as plate load resistors. They are a potential source of noise and the noise increases as the current flowing through them increases. The reason for this is because of fluctuations in contact resistance between adjacent granules in the carbon resistor, and is similar in character to the hiss occurring in carbon microphones. The obvious remedy is to use wire-wound resistors for the plate load resistance, or failing that to use carbon resistance of the highest quality only. Such high ohmage wire-wound resistors are rather expensive, but are nevertheless worthwhile incorporating in the first stage of a high gain amplifier. They are obtainable in Australia and are used in pre-amplifiers in Broadcasting stations extensively.



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R. E. Jones, VK3RJ, Federal QSL Manager.

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Another one for the stamp collector is Pklog, Ong Keh Kong, Malabar Radio, Java, Netherlands East Indies.

Help the QSL manager "enjoy" his inactivity in other directions, by claiming the cards on hand at The Bureau, 23 Landale Street, Box Hill. This is intended to catch the eye of the following VK3's:—

AC, AE, AP, AS, AX, AY, BD, BF, BG, BH, BK, BN, BS, BV, CA, CH, CQ, CU, DI, DJ, DS, DU, EF, EH, EI, EL, ES, EU, EV, EW, EZ, FG, FW, GB, GD, GE, GR, GU, GX, HI, HV, IA, IB, ID, IF, IM, IP, IS, IT, IU, IV, IY, JM, JP, KQ, KT, KY, LF,

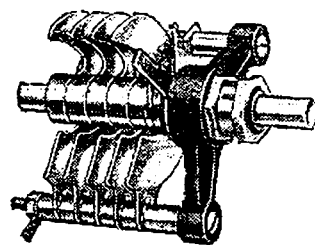
Continued on page 16.

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SYDNEY: United Radio Distributors Pty. Ltd.

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HOBART and LAUNCESTON: W. & G. Genders Pty. Ltd.

# DX Notes

By VK3MR.

I notice by the VK5 notes there is somebody like myself with a depraved sense of humour signing themselves "ex-VK5RM." It has been said that great minds think alike! The trouble nowadays is that there is little to relieve the monotony of the European situation which is dished up with the bacon and eggs every morning, very trying on the digestion, too. Pity he didn't take on ham radio when a boy!

Notes are scarce this month, as most of the old reliables have joined up in the R.A.A.F. or the Army and Navy as operators. Your scribe is still practising to pass the 16 w.p.m., as still more are required. Applications for the position of traffic manager are here now assured that Morry can handle the brass. This is my personal recommendation. Our dear old editor has started his funny business again by querying my "selections" in last month's mag. He is quite his old self again now as he has eased his conscience regarding last income tax returns. Added to the list of countries worked we hear from Ted (3QK), who has worked 121 and 108 verified, which is great work for the short time on the air. Ted is now reclining down in Churchill Island, near Phillip Is. (He spells it Phip-pit Is., but I think his mill slipped). He has everything suited for radio and big Vee beams including 100 ft.

Continued from page 15.

LH, LI, LM, LQ, MJ, NB, NC, ND, NT, OA, OE, OI, OU, OZ, PC, PH, PK, PJ, PL, PV, QE, QG, QT, QZ, RF, RL, RV, SC, SE, SK, ST, TA, TC, TD, TF, TM, TP, TY, UC, UV, UX, VA, VB, VD, VV, VW, VX, VZ, WH, WR, XC, XG, XK, XL, XQ, XR, XU, XZ, YG, YH, ZC, ZD, ZG, ZJ, ZL, ZO, ZS.

Bill Barratt, VK3WT, has moved into civilisation in Geelong, and is anxious to see how the new location works out. He extends a hearty invitation to all hams passing through to look him up.

high pines. What a blow Ted. He is very pleased with his Centenary certificate. I would like to exchange W cards from any eastern State for one from S. Carolina. A complete set of WAC's will also be offered. Season's compliments to all.

## NORTHERN ZONE NOTES.

By ex-VK3BM.

Many thanks, gang, for FB returns to my requests for dope, the notes forwarded for publication mentioned nearly every member in the zone, but—we will blame Hitler for their non-appearance. One of the many problems to be solved during this war is how a notes correspondent is to get dope from the gang scattered over half the State AND further! without our means of communication? It's up to you chaps to let me know the doings.

3OR Murray responded to the call of the R.A.A.F. WR early in the piece has established himself and family in Melbourne, and is operating at Victoria Barracks.

3KR—Ken left Melbourne to take on talkie operating at Benalla, but soon after received the call and is, we believe, at Point Cook.

3EP—Ted is very busy in Bendigo and missing the chin wags over the air—but aren't we all. Had just completed an fb new rig, too.

3QZ—Graham had started to build his modulator.

3TL—Had an unfortunate fall from a ladder, but is now recovering—bad luck, 0M!

3HX—Left Charlton for address unknown as yet.

3FF—Had only just completed a beautiful new rig, all aluminium rack and panel, and it worked like a dream.

3JG—Had just landed a swag of Bliley Rocks. Plenty of time for yachting now.

3ZK—Will have to complete his affairs by mail!

3EC—Taken up yachting.

3BM—Has tried cinematography and philately, but anyway is too busy with the harvest to be worried.

## 28-56 MC Notes

A. Pritchard, VK3CP.

We still have our old interest, and although we cannot press the key or warble into the mike, we still hear our numerous old friends in the States, who are coming through very well at present. The CW portion of the band is very lively and gives us plenty of opportunity to keep our code up to scratch. The following are on the job quite often: WILFI, IGBD, 2KZN, 3BKH, 4EED, 4FIG, 5HGD, 6LCP, 7BAA, 8AJE, 8FTM, 9GKZ, showing all districts active, in fact, more so now than before the war. This must be due to the lack of foreign QRM which has taken up the low frequency end of the band.

The phone men have been experimenting with the latest method of modulation, this being the cathode system, and K6PLZ in particular, of 100 WAC's in two years fame, has spent some time with this, and finds that the results are all that could be desired. The main advantage is that less audio is required for 100% modulation of the full carrier available for plate modulation, as compared with the best of grid bias systems, i.e., the class BC amplifier, which compromises a maximum carrier output with a minimum of audio for 100% modulation, but which possesses the disadvantage of requiring considerable reduction of the carrier power.

Other phones coming through well are WIYE, WIKTF, 2ICL, 6PDB, 7BQX, 8FXM, 9DRQ, not forgetting 'the old faithful' 6POZ, with his 'plumber's delight' 3 element beam.

The beam is of all steel construction with welded joints, the whole system being grounded, and those who are using it are putting through outstanding signals. As no insulators are required with this ideal scheme these sources of losses are completely removed. Several insulatorless beams have been described in Radio (Calif.) for 56 mc., and higher frequencies, but so far as I know, none of these beams have been tried in VK. Talking of antennae, K6QXY has his beam on top of a 40 feet stick of 6 in. x 6in. section and no guy wires.

Two visitors at present in the States are SM5YU and ZLILC, the former speaking excellent English and the latter excellent (?) American.

Those elusive K7's are showing up represented by K7EMN and K7GZH. Experience has shown that, like Europeans, they only come through for a short period of the year. Other countries are represented by KAIME, KAIOZ, XU8AM, ZS6W, HQ5AD (qso'd by J2XA), XEIAM, XEIGL, TI2AV, and CXIFB. Unfortunately, these only provide good hunting for the W's. Fate would predict that we cannot participate.

In the October QST, an article on the series valve noise limiter should give the lads a few ideas on this subject. The limiting valve works in conjunction with the second detector adjusted for infinite impedance detection so that very little change over is necessary to test the idea.

Of the many W's active on 56 mc., one has at last succeeded in contacting all districts. W6GPY and W6ZA have been experimenting on 325 mc., (below I meter) with low power and have established entirely satisfactory phone communication over a path of five miles. Their observations are interesting,—firstly the almost complete lack of auto QRM in receivers, and secondly, that readable signals have been obtained over a similar distance with a hill in between. 112 mc. has previously exhibited similar immunity from the limitations of an optical path.

VK's 3BQ, CZ, and CP, and poppa de EX had hopes of developing the art of portable ham radio on a trip to East Gippsland, which was planned in the early part of the year for November, but such valuable time will now be spent calling CQ's to blondes (auriferous?) and trout, to the accompaniment of mosquito QRM. The boys should return in good health and spirits if Max maintains his customary culinary proficiency as was magnificently displayed at Torquay.

## Divisional Notes

### IMPORTANT.

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceding publication.

#### N.S.W. DIVISION.

President: H. F. Petersen, 2HP.  
 Vice-Presidents: W. G. Ryan, VK  
 2TI and F. Carruthers, VK2PF.  
 Secretary: C. Horne, VK2AIK.  
 Treasurer: H. Ackling, VK2PX.  
 Editor of Notes for this Division:  
 J. H. Fraser.  
 Next Meeting: Thursday, December  
 14th.

Interstate and Country Visitors  
 should ring FX 3305.

Well, here I am, back on the job of writing these notes. Last month I was in camp and I left the job to 2TI, and I would like to take this opportunity to thank him for doing the Magazine Manager's job for the month. I went to Nowra Show-ground for the thirty days' camp with the 1st Cavalry Division Signals. There were quite a few Hams in camp, including 2UP, 2RF, 2ALG, 2ACS, Ex-ZLIAQ, Ex-VK3ZE and 2AFJ. The camp was a great success, and for my part, I would not have minded if the camp had lasted for three months.

The secretary reports that the register of Hams on Service will be published very shortly. We are actually waiting for the final list from

our representative at Richmond Aerodrome.

The meeting held during October was well attended, about 50 hams being present. The lecturer was Mr. Ross Trehearne, who spoke on "Some Interesting Phases of U.H.F. Work."

The November meeting was also well attended, between 30 and 40 hams being present. The lecturer was Mr. R. Lackey, Chief Instructor at the Australian Radio College. The title of his lecture was "Factors Determining the Choice of an Intermediate Frequency." The lecture was well received and there was quite some discussion at the end of the lecture.

Rev. W. Kennedy moved a vote of thanks to Mr. Lackey, and said that if the discussion was any indication the lecture must have aroused considerable interest. He complimented Mr. Lackey on presenting an involved subject in simple terms. The motion was carried with acclamation.

There does not seem to be much news this month, fellows. I seem to have got out of touch with things, being away for a month. Incidentally, I don't expect to be writing these notes much more, because, if I have to go to the three months' camp, I will have to resign from the

## HAMS!!

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Council, temporarily at least, so that someone else can be appointed to the council to carry on the job of "Magazine Manager."

Readers will be pleased to know that the past president of the U.H.F. Section, Mr. D. B. Knock, is now a Lieutenant in 1st Div. Sigs. Also 2UP, a past councillor of the Institute, has transferred from 1st Cav. Sigs. to the A.I.F., as a Lieutenant. Mr. London was my officer in Cav. Sigs before transferring.

Just a reminder to keep the secretary informed of any change of address. He reports that the Morse classes are making rapid headway. There are at present two classes, but very shortly they will be split up into three classes.

Well, that seems all this time. Write in and let me know any news, please.

#### WAVERLEY RADIO CLUB NOTES.

The fact that everyone's thoughts are now turning to A.R.P. and the like probably accounted for the popularity of the film on the above phase of war work, shown at the Waverley Club during last month. This really excellent film was supplied by the St. John's Ambulance, while Arthur Henry and his brother supplied and operated the projection equipment. Other films supplied by the Shell Oil Co. and General Motors completed what all the members voted was an excellent night's entertainment.

On the 17th October, Ivan Bailue produced a small projector and took us back 15 years by screening a Felix cartoon, and what must have been one of the first "Our Gang" comedies. Realism was added by the motor breaking down, the operator having to turn the handle for the rest of the show.

Mr. W. Stewart, one of the first members of the Club, was present at the Club on the 31st October, and treated the boys to a talk on his varied experiences in the country. Varied they must have been for the chuckles haven't died down yet.

The Club still meets on every Tuesday night at rear of "Almont," 13 Macpherson Street, Waverley, and non-members wishing to keep alive the spirit of "hamdom" are cordially invited to be present.

#### KEY SECTION NOTES.

By VK3CX.

The November meeting of the K.P.S. was postponed for one day on account of the Melbourne Cup to enable the lads to recover after celebrating their winnings. However this did not prevent a bumper attendance, and the Institute Rooms were filled to overflowing when QW called the meeting to order at 8 p.m. Business was quickly run through to enable us to get down to the treat provided by RJ, which was in the form of an illustrated lecture on how Picturegrams are sent from Sydney to Melbourne. The pictures flashed on the screen, together with a diagram of the transmitting and receiving equipment made the lecture very interesting and easy to follow. Photos of a beautiful blonde evoked much comment, and some lads were heard asking RJ how they could get a job with her. His lecture was most instructive and as in addition, he was able to give the lads some news of 112 Mc. work, he was the hero of the night.

This lecture was followed by a demonstration of KN's new receiver—a HQ120x. Even the thought of this receiver still makes me envious, so I won't extoll its virtues, except to say that it is a humdinger of the humdingerest kind.

CZ has leave from work and is going prospecting. He hopes to persuade BQ and CP to go along with him and they have visions of striking it rich. When last seen Arthur had an armful of literature from the Mines Department and a far away look in his eyes. Yes, lads, "Thar's gold in them there mountings," and speaking of this, I hear that MR was absent from the last meeting due to an urgent appointment with his dentist that he had kept.

RX still has blonde trouble (he says "It's no trouble"), and is looking for a new flat near the beach—the accent on the last word is heavy as in "feet". CX had a hamfest of his own in the R.A.A.F., where he met about 35 hams including representatives from all States. SG can't give up his radio, and has installed his receiver at his bedside in order to hear all the dx that he is missing! BQ is still doing good work on SS receivers.

Instructive lectures are promised for future meetings, and all hams

will be well advised to keep K.P.S. meeting nights free, and turn up. A good time is assured.

**QUEENSLAND DIVISION.**

By 4AW.

Meetings of the VK4 Division will, in future, be held the last Thursday in each month, at the rooms of the Diggers' Association, Essex House, Adelaide Street, Brisbane. Note: The December meeting will be held on 21st and not 28th, owing to the holiday period. As mentioned in previous notes, our student classes of instruction have been discontinued, but a move is afoot to co-operate with other patriotic bodies in the matter of Radio instruction.

Country members! We would like to hear from you occasionally as to your present activities, so that we are able to keep this social column going. Our postal address remains the same.

4JB—Very busy painting.

4FB—Touring around the country looking for good portable locations. Is building a battery portable super. (Not BCL).

4UR—Concentrating on receiving code. Must be able to take 35 per now, Jack.

4UR — Likewise code swatting. Very keen on exchanging photos.

4FJ — Just been promoted in charge of Radio department of his firm. Keen on R.A.A.F.

4KS—Joining up RAAF Reserve, and putting in some time on Radio study.

4XO—In Brisbane at present, and is doing good code practice with 4KS. After commercial ticket.

4JP, 4RY and 4AW it is rumoured, have been seen indulging in golfing exercises. Judging by the swings and the language, it should not be long

before they are able to take on any of the VK2 or VK3 boys.

4PX—Joining the R.A.A.F., likewise 4HD.

4WT—Just finished painting the shack and now sure looks fl.

4KH—Concentrates on the receiving side. Bill did not know there were so many S/W BC stations. Says we will be on the air again before 1940. I hope so.

4UU—Our QSL officer is complaining now of the scarcity of cards. O yeh! I still want my Yankee WAS.

4HU—Just returned from camp. Brass pounding.

4ZU and 4LT—In camp. Brass pounding.

4E1—In Brisbane—Camp.

**SOUTH AUSTRALIAN DIVISION.**

VK5RM.

In November, the Institute moved from its old rooms in Rundle Street to new quarters on the second floor of Chapman Buildings, in Bank Street, which is opposite the Railway Station. Code classes have been resumed and are still held every Wednesday and Friday night, and both members and non-members are welcome, the classes being free to all amateurs.

On Wednesday, November 8, Mr. J. De Cure very kindly came and gave us another code test at speeds of 12, 15, 18, 20, 22, and 25 words per minute. Each test lasted for five minutes and showed that over half of those who took the test would receive at 22 w.p.m., and about a third of them showed quite good efficiency at 25 w.p.m. On the same night, we had an unexpected visitor from the country as Clarrie Castle (5KL), who was down from Yunta, where he is an operator in VHU9, dropped in.

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We wish him the best of luck and hope to see him again soon.

Some members are going to sit for the Second Class Commercial exam., which is to be held on December 5th and 6th, at the G.P.O. Study circles are being held for these members twice weekly, when they discuss the theory section of the syllabus. The code speed required for this exam. is 16 cypher groups per minute.

Professor Kerr Grant is kindly giving us a lecture on November 15 on "The Generation of High Voltages and their Use in Modern Transmission Experiments." The lecture will be given in the new rooms, and a council meeting will be held before the lecture starts.

In the new year it is hoped to start another A.O.C.P. class, covering a period of six months. Code and theory will be dealt with, as in previous classes.

QSL cards are still coming in from all over the world, and the Institute has cards for the following stations:—

VK5AG, AP, AR, BF, BG, BN, CM, CB, DY, DK, DC, DX, EM, FN, FG, FA, FX, GB, GA, GS, GN, HK, HC, HR, HS, HW, HA, JK, JG, JU, KR, KB, KX, KJ, KY, KM, LC, LS, LY, LM, LZ, LH, LO, LJ, ML, MW, MH, NL, NW, NA, RJ, RL, SL, UK, TW, WD, WM, WK, WJ, WG, XR, XL, YQ, ZU, ZK, ZR, ZN.

These stations can get their cards by sending a stamped addressed envelope to the Institute.

#### WHY NOT A GARDEN BATTERY?

In English "Wireless World," of July 27th, 1939, is described a novel battery for running a receiver using 1.4 volt low consumption valves. One sets to work by digging a hole one foot deep and a yard square, and laying at the bottom a sheet of zinc with an insulated wire attached. Cover with a few inches of earth and trample well down, following with a layer of crushed coke in which is embedded a number of carbon plates and rods similar to those used in large size dry cells. Connect all the rods together, fill up the hole with the remaining soil and liberally douse with salt water. It is stated that on short circuit, the "battery" will blow a five amp fuse! However, it should be remembered that, in addition to spoiling portion of the garden, the digging of the hole will show the YF you do know how to handle a spade after all.

Continued from page 10.

#### (B) VOLTAGE AMPLIFIERS.—

The characteristics of normal output valves are such that they require relatively high values of grid excitation voltage. In cases where the detector is incapable of delivering the voltage required, or where, for reasons of sensitivity, higher gain is needed, it is usual to incorporate one or more stages of voltage amplification between the detector and the output valve.

An ideal amplifier should be capable of amplifying equally all frequencies in the audible range (approximately 30 to 15,000 cycles per second). If it fails to do so, it is said to have frequency distortion. Frequency distortion can usually be attributed to the presence in the circuit of reactive components, which, varying with frequency, tend to alter the conditions in the circuit.

Present-day requirements demand a voltage amplifier having a reasonably level response between approximately 50 and 7,500 cycles per second. Extension beyond these limits is seldom warranted, since other factors such as side band attenuation, speaker response, and effective speaker baffle area impose limitations far more serious than those likely to be encountered in the voltage amplifier itself.

One other form of distortion, which can be very serious, is that known as the "Harmonic Distortion." This refers to the tendency of an amplifier to introduce spurious frequencies which have a harmonic relationship to the frequency (or frequencies) of the applied input voltage. The average amplifying valve under ideal conditions introduces negligible distortion, but when operated under other conditions, such as incorrect grid bias or plate-load resistance, may cause very serious harmonic distortion. (It should be noted that this subject has been treated very comprehensively

in the third edition of the "Radiotron Designer's Handbook.")

The audio stage of early radio receivers used triode valves coupled by means of interstage transformers, which usually had a step-up ratio of the orders 1 : 3, or 1 : 5. Such transformers in themselves afforded useful gain, but for the most part were of relatively poor design resulting in poor quality reproduction.

With a typical general purpose triode valve, the stage gain increases rapidly as the plate load resistance is increased until this approaches a value of approximately five times the plate resistance of the valve. Increasing the load above this value then produces very little increase in stage gain.

When the plate load of a triode valve consists of the primary winding of an unloaded audio transformer, it is important that the inductive reactance of the valve at the lowest frequency, which it is desired to reproduce without serious attenuation.

For a typical general purpose triode, having a plate resistance of 10,000 ohms, the primary should have an effective inductance of not less than 20 henries. The average inductance of early transformers under working conditions was considerably less than this, and the brass correspondingly poor.

The inductance of a transformer (or choke) is dependent on three main factors:—

- (a) The number of primary turns.
- (b) The core material.
- (c) The amount of direct current flowing through the windings.

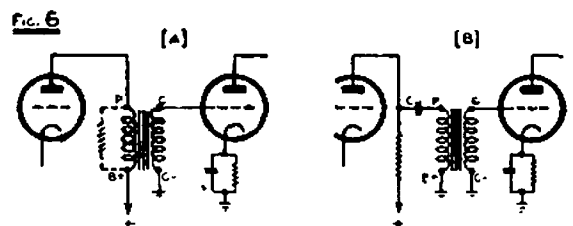
It is not practicable to continue indefinitely the addition of turns to the primary and secondary in order to obtain a higher primary inductance. As the number of turns is increased, the distributed capacitance across the windings also increases, and what is gained in bass response

is liable to be lost in high-frequency response, due to the added capacitance effects. In many modern transformers the windings are wound in separate sections and arranged in such a way as to minimise distributed capacitance.

The "Permeability" of the core material has also a marked effect on the inductance of a transformer, and is, therefore, also an important factor to be considered in the design.

When direct current flows through one of the windings, it produces a uni-directional magnetic flux in the core material, which reduces the effective primary inductance. The use of a butt joint, or air gap in the magnetic circuit minimises but does not obviate this effect. One well-known make of transformer has, in the absence of magnetising current, an inductance of 260 henries, which however falls to 80 henries at the full-rated primary current of 10 milliamps.

The plate current may be isolated from the primary windings by shunt-feeding the valve. Fig. 6 illustrates (A) the conventional, and (B) the shunt-feed method of connection. With the latter arrangement, the



operating conditions of the valve are quite different to those in the conventional circuit, and the output voltage available from the stage is much smaller. In cases where lower output voltages can be tolerated and the shunt-feed connection used, the resulting increased inductance usually enables better frequency response to be obtained. Under these conditions, the coupling condenser



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Signed.....

Address.....

.....

Date.....

\*Age limits are 18 to 35 years and minimum operating speed is 16 w.p.m.

NOTE 1.—Enclose separate sheet giving full details of qualifications, etc.

NOTE 2.—Persons who do not possess the above qualifications, but who are desirous of enlisting for training as wireless operators may do so by applying to the above address stating full particulars.

"C" should have a reactance which is small in comparison with that of the transformer primary at the lowest frequency to be reproduced. In general, for a transformer of given primary inductance, the bass response may be adjusted, within certain limits, by using a coupling capacitance of such a value as to give a suitable resonant frequency with respect to the lowest frequency to be reproduced. For an even bass response the resonant frequency should be chosen below the latter.

It will be seen from the foregoing discussion, that even for general purpose triodes, the design and production of interstage transformers having a good frequency characteristic are by no means simple.

High gain triodes, such as type 6B6-G, have a relatively high-plate resistance and are not suited to transformer coupling, since the requirements of high inductance and low distributed capacitance are such that satisfactory transformer design is impracticable.

For the same reason, transformer coupling is also unsuitable for use with tetrode or pentode voltage amplifier valves.

When for some reason it is necessary to use a transformer having insufficient primary inductance, the variation with frequency of the plate load impedance of the associated valve may be reduced by loading the primary or secondary with a resistor as shown in Fig. 6A.

With few exceptions modern receivers use resistance coupled voltage amplifiers. In the main resistance coupling has the advantage of cheapness and the ability to provide an even response over a wide frequency range. In addition, the chances of hum pick-up are minimised with the elimination of large iron core inductances, which tend to pick up by induction hum volt-

ages from the power transformer and filter chokes.

Modern high gain triodes, when resistance coupled are capable of providing stage gains comparable to those of normal transformer coupled stages. Resistance coupled pentodes, however, such as type 6J7-G, working under optimum conditions are capable of providing higher stage gains than those obtainable from triodes, with better fidelity and less distortion. The actual voltage output capability (for a given plate supply voltage) is usually less than that of transformer coupled stages, although, in the majority of cases, it is ample for all requirements. Figs 7 and 8 show typical circuit arrangements for triode and pentode resistance coupled stages respectively.

Special circuits are necessary when it is desired to excite push-pull output valves, and some designers prefer to use in this case a push-pull audio transformer.

It is beyond the scope of this lecture to investigate fully the design of resistance coupled amplifiers, but

FIG. 7

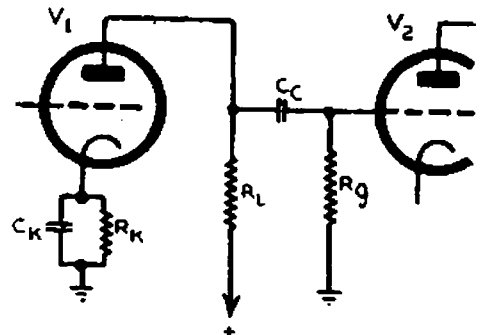
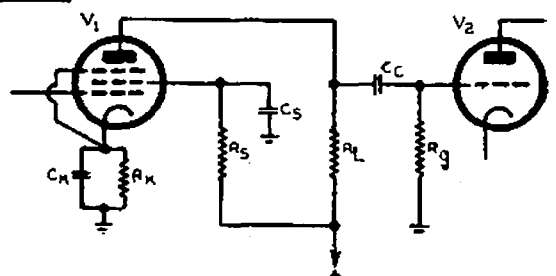


FIG. 8



a consideration of certain aspects may be of value.

The maximum D.C. plate voltage rating of a valve refers to the maximum permissible D.C. voltage which may be applied between plate and cathode. With resistance coupling, the supply voltage may be made equal to approximately twice the rated plate voltage, due to the voltage drop which occurs in the plate-load resistor. For a given percentage distortion, the maximum output voltage of the stage increases with the supply voltage.

It has already been pointed out that the stage gain with a normal triode increases rapidly with the plate load resistance until the latter approaches a value of approximately five times the plate resistance of the valve, beyond which point further increase in load resistance produces little increase in gain. It is desir-

able, therefore, that the value of the plate-load resistor should be at least five times the rated plate resistance of the valve.

There are, however, other factors which must be considered. It can be shown that the grid resistor ( $R_g$ ), which, for audio frequencies, is effectively in shunt with the plate load resistor ( $R_l$ ), has a marked effect on the performance of the stage, tending to reduce the output voltage capabilities and stage gain, and increase the distortion. The grid resistor ( $R_g$ ) should have, therefore, preferably at least five times the resistance of ( $R_l$ ), but in practice its value is limited by the maximum permissible grid circuit resistance of the valve  $V_2$ . For the majority of power output valves, this resistance is .5 megohm under self-bias conditions. The final choice of  $R_l$  therefore must be a compro-



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mise between optimum load and the ratio of  $R_g$  to  $R_l$ . For high gain triodes (e.g., type 2A6) or pentodes, which have high values of plate resistance, the usual value of load resistor is .25 megohm. With lower gain triodes, having plate resistances of the order of 10,000 ohms, a plate load resistor of .05 to .1 megohm is satisfactory.

The capacitance of the coupling condenser ( $C_c$ ) depends mainly on the value of  $R_g$ . At low audio frequencies the reactance of condenser ( $C_c$ ) rises and tends to cause loss of response. The following table shows the recommended values of capacitances of coupling condensers ( $C_c$ ) for various values of grid resistors ( $R_g$ ). At first sight, the values may appear to be excessive, but it should be remembered that where several such couplings are used, as may be case in a multi-stage amplifier, any losses so introduced are cumulative, and may result in a poor overall frequency response. In a simple receiver the coupling condensers may be reduced with negligible loss to one half the values shown.

Grid Resistor ( $R_g$ )	Coupling Condenser ( $C_c$ )
2 megohms	.01 Microfarad
1 "	.02 "
.5 "	.05 "
.25 "	.1 "
.1 "	.25 "
.05 "	.5 "

Where  $R_g$  is limited by circumstances to .05 megohm (50,000 ohms) (e.g., as in the case of certain power valves when operated under fixed bias conditions), the plate load resistor  $R_l$  of the preceding valve should preferably not exceed 25,000 ohms, so that a valve having a very low plate resistance is required for the voltage amplifier stage.

The operating conditions of a pentode voltage amplifier are more critical than a triode, in that one more factor has to be considered,

namely, the screen grid voltage. The overall performance, however, is superior to a triode in most applications, for which it is advisable to adhere rigidly to the recommended operating conditions, as listed in Radiotronics Bulletin No. 76, and also in the loose leaf Radiotron Valve Data Book under "Resistance Coupled Pentodes."

The capacitance of the screen bypass condenser ( $C_s$ ), at the lowest frequency which it is desired to reproduce, should be such that its reactance is very small compared to the resistance of the screen dropping resistor ( $R_s$ ). The value of  $C_s$  may be .5 microfarad when  $R_s$  is 1 megohm or less, and .25 microfarad for values in excess of 1 megohm.

For obvious reasons, the condensers  $C_g$  and  $C_s$  should both have extremely low leakage, as even a few micro-amps. of direct current through the associated high value resistors can vitally affect operating conditions of the valves and lead to serious distortion.

#### (C) GRID SUPPLY VOLTAGE.—

Except in special cases, the grid of an amplifying valve must be maintained at a potential which is negative with respect to the cathode or filament. The actual value of this "grid bias" is, of course, dependent on the valve type and the particular conditions of operation. The bias may be applied in one of two ways. If the filament or heater is maintained at earth potential, the grid return may be made to a point which is negative with respect to earth. Alternatively, the grid may be returned to earth and the cathode or filament made positive with respect to earth.

In battery receivers where the filaments of a number of directly heated valves are connected in parallel, the latter scheme is not usually practicable, as individual requirements of bias for the various valves can-

not be satisfied. When the filaments are wired in series-parallel and operated from a higher voltage source (as in some vibrator receivers), the problem is different, and it is frequently possible to arrange the circuit so that each valve receives its correct bias. Particularly useful in this respect are the Australian type 1M5-G, and the type 1C7-G, which may be operated without negative grid bias.

In the majority of battery receivers, it is simpler to connect the negative side of the filaments directly to earth and apply the bias in the grid circuit. The bias voltages required may be obtained either from a "C" battery, or from a suitably tapped resistor connected between the negative side of the high tension supply and earth. With the latter arrangement, some form of grid circuit decoupling is frequently necessary to prevent feedback through the bias network.

It should be noted, that the rated grid bias of a battery valve refers to the D.C. potential difference which should be applied between the grid and the negative filament

pin, which is usually connected to earth. Incorrect connection of the filament battery has therefore the effect of reducing the bias by an amount equal to the filament voltage. With directly heated valves intended primarily for A.C. operation, the grid bias, unless otherwise specified, is measured between the grid and the mid-point of the filament.

In mains receivers, designers have the choice of using back-bias or self-bias. With back-bias, the cathodes of the valves concerned are directly earthed, and the grids returned to suitable tapings on a resistor connected in series with the negative arm of the high tension supply. With such an arrangement, it is possible to eliminate entirely the need for separate cathode bias resistors and condensers.

The self-biasing method utilises the voltage drop produced by the cathode current flowing through a resistor connected between the cathode and earth. The direction of this current is such that the cathode becomes positive with respect to earth and therefore to the grid,

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which is returned to earth. The cathode current is equal to the plate current in the case of a triode, or to the sum of the plate and screen currents in the case of tetrodes and pentodes.

When an alternating voltage is impressed across the grid input circuit the cathode current does not remain constant but varies at the frequency of the applied voltage. The resulting voltage developed at the cathode is in phase with the applied grid input voltage and tends to reduce the potential difference between grid and cathode. This is equivalent to a reduction of stage gain, and the method is one form of applying degeneration (or negative feedback). This degeneration may be minimised by connecting across the resistor, a condenser having a capacitance such that its reactance, at the par-

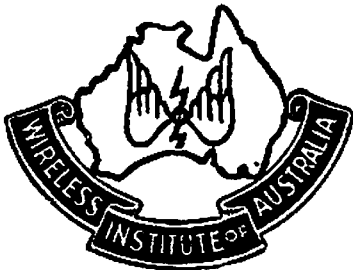
ticular frequency or frequencies concerned, is small compared with the value of the resistor. In R.F. or I.F. stages, conventional capacitance employed are of the order of .1 microfarad. In the case of audio amplifiers, however, the value has to be very much higher and electrolytic condensers having capacitances from 10 to 25 microfarads are generally used. If the capacitance is too small it is effective only at the higher frequencies, and leads to loss of bass response. The gain of the average stage without the condenser is about one half of that with the condenser in place.

Self-bias is most satisfactory in cases where the average cathode current is substantially constant for all values of grid input voltage. In power amplifiers in which the average cathode current varies with the grid input level (e.g., under conditions of overbiased or Class AB1 operation), the use of self-bias produces a drop in power output. In extreme cases, as with class B output stages, self-bias is quite unsatisfactory.

(To be continued).

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