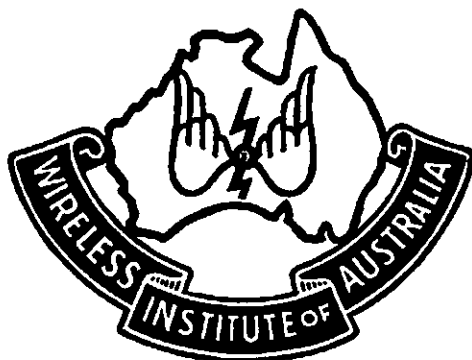


SIXPENCE

JANUARY 1944

AMATEUR RADIO

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... VACUUM TUBE VOLTMETERS ...

By Alec H. Clyne. VK3VX

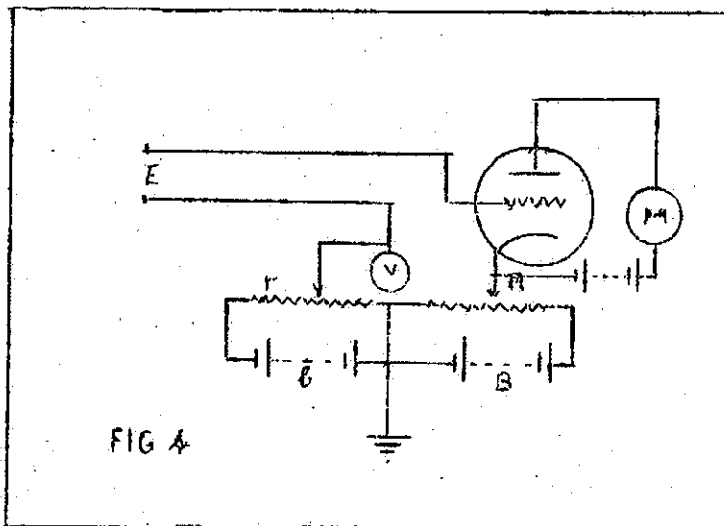
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PART 2 (Continued)

(b) The SLIDE-BACK V.T.V.M. .. One of the cardinal rules of all laboratory procedure is that the measurement of an unknown quantity is often most conveniently and accurately accomplished by balancing it against a known variable quantity in such a way that inaccuracies in the measuring equipment may be as far as possible cancelled out.

Hence we have such instruments as the slide-wire potentiometer for measuring DC voltages and the Wheatstone Bridge for resistance and in a modified form for reactive impedances.

The Slide-back VTVM is really an electronic off-spring of the Slide-Wire Potentiometer, being an instrument in which measurement of an unknown voltage is made by balancing its effect on the grid of a vacuum tube against the effect on the same element of a known (or measurable) DC voltage. The Slide-Back VTVM is shown in its simplest form in Fig 4.



Neglecting voltmeter V and the associated resistor r and the battery b it will be readily seen that the instrument is a simple plate rectifier type except that instead of the usual cathode resistor bias a battery and potentiometer are used in the cathode circuit to provide the necessary bias.

In operation the resistor R is first adjusted to give a low reading on M when the

input terminals E are shorted, this reading, the "false zero" should be some low value, say .5m.a. The actual value is of no consequence, but it must always be the same value. R is then left set and plays no further part in the measuring procedure.

When a voltage is applied at E the plate current shown on M rises. Then by adjusting r the bias applied to the tube may be increased and the plate current brought back to the original level.

It is now obvious that the additional bias has an effect on the grid of the same magnitude but opposite to that of the applied voltage. Hence the voltmeter V, which reads the additional bias voltage, also gives an indication of the effect of the applied voltage E.

When E is DC then V reads its actual value. When E is AC the reading on V may indicate RMS, average or peak value according to the characteristics of the vacuum tube circuit. In the form shown V indicates average value. By connecting a condenser between cathode and earth it may be made peak reading.

A study of the circuit arrangement will suggest that V, r and b may be omitted and R used to adjust the balancing bias, and if R were to have a pointer moving over a calibrated scale then the final result could be read off from the scale. This is sometimes done to save the cost of the meter V (which incidentally should be a good one). However it is necessary when using this simplified arrangement to make two readings from the scale thus increasing visual errors by 100%. It is not possible to have a fixed zero since, due to battery deterioration, or variation in any other source of supply voltage, it is always necessary to set R to secure the desired initial reading on M before using the instrument.

The outstanding advantage of the Slide-back VTVM is that, being a comparison instrument it requires no calibration by the builder. This is taken care of by the manufacturer of the volt-meter V. Thus high accuracy is possible. Naturally only steady voltages may be measured; the instrument is capable of following moderately rapid variations but the operator never is.

Probably the most common application of this instrument is when a temporary set-up is required in a hurry, the absence of the necessity for a calibration then becomes important.

(c) D.C. AMPLIFIERS ... The accuracy of any type of Vacuum Tube Voltmeter is restricted at low values of applied voltage by the visual accuracy possible in reading the indicating device. It is desirable therefore when measuring very low voltages to have some means of stepping up the sensitivity of the whole instrument.

Some form of amplifier immediately suggests itself, and since it is only necessary to amplify DC it may be made very simple.

On this point there may be some misconception, therefore it is necessary to point out here and now that in referring to DC amplifiers, we mean DIRECT CURRENT AMPLIFIERS, which paradoxically enough we use to amplify a DC voltage. The term DC is also used in connection with amplifiers to mean Direct Coupled, but although we use a Direct Coupled Amplifier to amplify DC we refer to it as a DC Amplifier, not because of its circuit arrangement, but because of its application.

The above wordy explanation is occasioned by the contention in a certain local handbook that DC amplifiers are inclined to be inconsistent in performance, probably that is true of Direct Coupled Amplifiers used for sound reproduction, but they are quite suitable as DC Amplifiers for use with Vacuum Tube Voltmeters.

It will now be obvious that we propose to amplify the output from the rectifier, and it may be asked why not place the amplifier ahead of the rectifier. This is a possibility if the instrument is to be used on a fixed frequency, or on a narrow range of frequencies, but the problem of designing an amplifier to give constant amplification on all frequencies from DC to say 100 Mc/s is one that not even a Ham would attempt, even if it could be done.

It is also well to note that the addition of an amplifier is not the only solution, but it is probably the best. Alternatives are to use a very sensitive meter of the usual type or to use a mirror galvanometer having a scale several feet long if desired, but both have obvious disadvantages.

Getting back to our DC amplifier, all that is necessary is to use the rectified output of the voltmeter tube to change the bias on a second tube, and then read the plate current variation in the latter to give the desired result.

The amplifier then boils down to the arrangement shown in Fig 5, where it is shown applied to the output from a Diode-Capacity VTVM to indicate how it may be used. In this case the voltage V applied to the DC amplifier is taken from across the condenser in series with the diode. With other types it may be taken from corresponding points, for instance across the plate resistor of grid rectifiers or

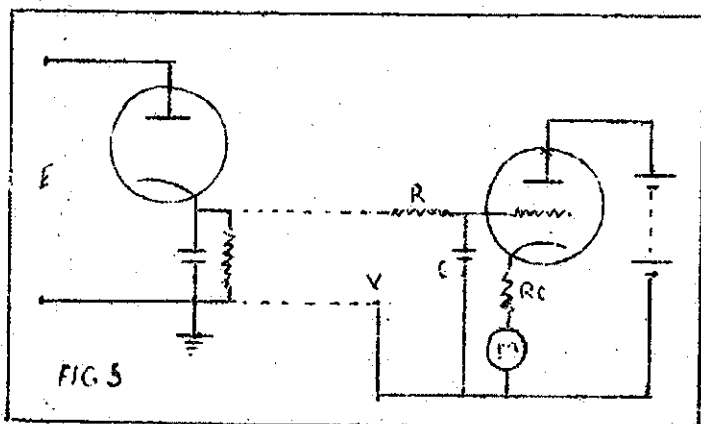


plate rectifiers. In the case of the reflex type it would, of course, be taken from the cathode resistor.

The resistor R and the condenser C are included in order to filter out stray AC, which might be rectified by the amplifier and cause error.

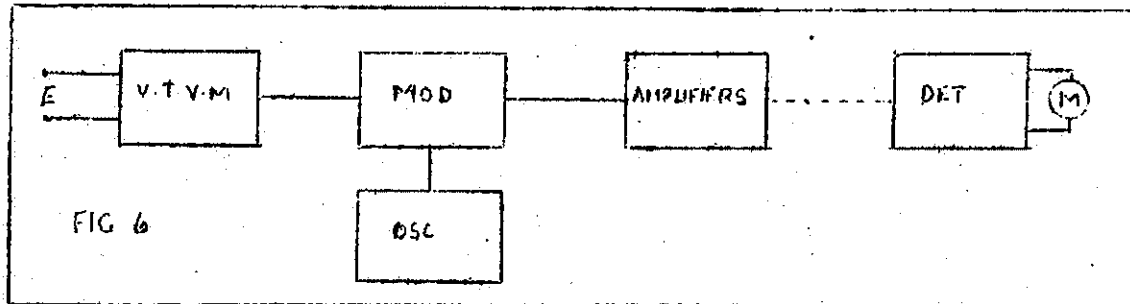
In the design of such an amplifier it is necessary to know the value of V which is to correspond to full scale reading on meter M. Assuming that the characteristics of the VTVM are known, as they should be, V may be calculated. In the arrangement shown V is equal to the peak value of E. In the case of say a plate rectifier VTVM the maximum value of V may be found by measuring the "full scale" plate current of the voltmeter tube and combining it via Ohms Law with the value of the plate resistor. By "full Scale" plate current we mean that which corresponds to the maximum value of E to be measured.

Having the maximum value of V it is now necessary to choose a suitable tube and set of operating conditions so that V max will produce full scale deflection on the meter M. This may be readily done with the aid of tube characteristic charts, it being simply a matter of finding a tube whose plate current will swing from say .2 m.a to full scale current of M, when the grid voltage is varied by an amount equal to V. This also gives the necessary initial grid bias and the value of plate voltage. R_c , the cathode resistor may then be roughly determined by calculation and finally adjusted to give the exact calibration desired.

As shown the amplifier has negative feedback, this is most desirable since it gives good linearity between input and output.

It is possible of course to use more than one stage of amplification, and provided that negative feedback is used good results may be obtained. A limit is reached when variations in the electron stream of the voltmeter tube cause serious fluctuations in the plate current of the final amplifier. This sets a limit to the ultimate sensitivity of conventional Vacuum Tube Voltmeters.

Another variation on the amplifier theme is that shown in block form in Fig 6.

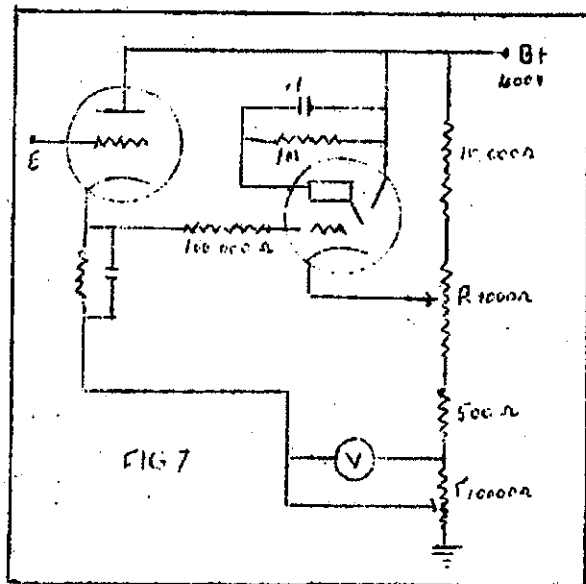


In this arrangement the output from the VTVM is fed to a modulator tube which also takes the output from the oscillator. The Modulator's AC output is then proportional to the DC output from

the VTVM and this may be amplified and detected, the output from the detector being read by a DC meter. Since the amplifiers operate on a fixed frequency they may have very high gain. Alternatively the output from the final amplifier may be fed to an antenna and radiated. This is the system used in some types of stratosphere balloons used for meteorological observations, and is really only a conventional transmitter modulated with DC instead of AC as in the case of speech transmission.

(d) MAGIC EYE INDICATORS ...The possibility of using a Magic Eye as an indicator in a Vacuum Tube Voltmeter is one which finds considerable favor among Hams. The Magic Eye when used properly is very suitable as an indicator, but if accuracy is desired, considerable care is necessary. By this is meant that the Magic Eye should be used only as an indicating device and not as a direct reading measuring device.

Bearing this point in mind it will be seen that the Magic Eye is very suited to use in place of the plate current meter in the Slide-back VTVM. A typical arrangement is shown in Fig 7.



The operational procedure is similar to that already described. First the input terminals are shorted and R is adjusted until the Eye is just closed. When voltage is applied at E the eye will flick open and it is necessary to adjust r until the Eye is once again just closed, when V is read off as before.

The Magic Eye is particularly useful in this application on account of its ability to take a heavy overload. Even this has its limits however, and the 100,000 ohm resistor is placed in series with the grid to limit the flow of grid current when the Eye is wide open.

The values shown in the circuit diagram are suitable when it is desired to measure voltages up to about 200 volts and may be varied to suit individual requirements. The resistor and condenser in the plate circuit of the magic Eye are shown with typical values for the 6E5 and will of course remain unchanged.

(e) BYPASSING... IN all the circuits shown in these articles bypass condensers have been omitted for the sake of simplicity.

With diode types bypass condensers are not necessary, but with other types it is necessary as a rule to bypass the plate with a small mica condenser, say .002 mmfd to eliminate stray RF introduced into the plate circuit through grid-plate and other stray capacities.

In most cases it is also necessary to bypass the meters and this is particularly so with the voltmeters used in the Slide-back VTVM's.

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The American War Production Board has made a call to all citizens who own property, or if they know of any other property, on which quartz crystals may be found. To be useful for radio purposes the quartz must grow in separate individual crystals, weighing at least half a pound, at least an inch thick and three inches long, colorless or light smoky. Crystals in clusters or masses are useless, as are the milky, rose and purple varieties... It is understood that a Melbourne firm have commenced mining for suitable crystal in Australia.

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Riveting inside small structures was impractical until the dynamite-filled heat detonated rivets were developed. The first detonator was a slow "soldering-iron" device, but today an electron "gun" allows one man or woman to "set" 20 to 40 rivets a minute! The electron riveter shoots high-frequency current into a rivet instantly raising the temperature of the powder to the detonating point.

.....

A new electronic device has been developed for testing four-engined bombers in flight. During flight the temperatures of all 72 cylinders, the changing temperature of the carburetors, exhaust and the oil in the fuel lines, and the pressures on the wing struts bulkheads and tail surfaces, are automatically recorded...

QST

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FOR SALE

The Victorian Division has a number of the Admiralty Handbook for sale. These are in brand new condition and are the 1938 two volume edition. Anyone wishing to purchase are advised to get in touch with the Secretary, Box 2611W, G.P.O. Melbourne.

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THE LUNAR PHOTOELECTRIC EFFECT ON RADIO WAVES

In the good old days many hams swore blind that DX was at its best on a clear moonlit night, while others were just as positive that the opposite was true. Perhaps the following notes which are taken from an article by O. Ferrell in "Radio", may shed some light (not moonshine) on the subject.

Recently Dr. Stetson announced his discovery of "moon rays" that positively affect E layer ionization, and a good correlation to DX-ing between 100 and 600 metres is now indicated. It is a simple fact that the light of the moon itself is too feeble to have any ionizing effect on the earth's upper atmosphere, and yet the fact that the ionization appears to depend upon the amount of the illuminated surface of the moon turned towards the earth has suggested some sort of photoelectric effect. Furthermore the fact that the effect is much more marked at sunspot maximum than minimum strongly suggests that the solar radiation falling upon the moon's surface is a primary factor.

It is not possible to be too dogmatic as to the nature of the bombardment from the moon, just as it is not wise to say what type of 'ray' causes the lunar surface to become radioactive. There appears to be a very wide choice of particles, including high velocity electrons, positrons, neutrons, deuterons, alpha particles and cosmic rays, not forgetting the greater numerical strength of the potentially weaker photon.

We can, however, assume that myriads of electrically charged particles arriving from the sun at the speed of light, strike the moon's surface and cause the probably raw element deposits there to become atomically excited emitting strong gamma rays or something akin to ultra-violet light whose high penetrating power affects the E region ionization.

It is pointed out that this is the result of several cycles of interlocking factors. The new moon rays are not detected at all times, but only at periods of sunspot activity and when the moon itself is approaching the optimum position in the heavens, i.e. if there should happen to be a particularly active sunspot group about two days before the full moon, the E layer ionization at night would rise notably. As the moon becomes full the lunar energy begins to decrease until two days before the last quarter, when it has its least effect.

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One of the newest developments in use by the U.S. Signal Corps in field communication is a four wire cable the size of a lead pencil. By means of carrier-current technique three telephone and four telegraph circuits may be handled simultaneously over a single cable, which are laid along the ground for distances up to 150 miles. Amplifiers are spaced along the way.....QST.

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- THAT HE WHO FIGHTS MAY READ -

A page of book reviews conducted for the benefit of
Hams in the Services, and others similarly situated.

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MICROWAVE TRANSMISSION, J. C. Slater. 310 pages 29/9.

Of American origin this is an advanced manual, dealing for
the most part with the mathematics of wave guides, transmission
lines and antennas for use in the centimetric wave portion of
the spectrum.

FREQUENCY MODULATION...August Hand...375 pages...34/-

Also American. Maths of Frequency Modulation, with descrip-
tions of Receivers Transmitters and Antennae. The Author of this
work has allowed himself to be side-tracked into an old argument
"is it Frequency Modulation, or Phase Modulation, or both or what..
..." Otherwise it appears to be very good, but needs a fair know-
ledge of advanced mathematics for a complete understanding.

In view of the fact that the two books reviewed above are of
a highly specialised nature and rather mathematical we are append-
ing this month a short list of some of the many other books avail-
able at present.

R.S.G.B. Handbook....Reviewed last month.... 8/3.

A.R.R.L. Handbook ...20th Edition...478 pages ...11/6

RADIO RECEIVING CIRCUITS HANDBOOK...Squire (Lond), 104 pages, 8/3.

OSCILLATOR AT WORK ... Rider (U.S.A.) .. 243 pages .. 20/-.

METER AT WORK ... Rider .. 152 pages .. 15/-

SERVICING BY SIGNAL TRACING .. Rider .. 360 pages .. 30/-

VACUUM TUBE VOLTMETERS .. Rider .. 179 pages .. 19/-

The prices shown here are the ruling retail prices in Melbourne
and are subject to variation from time to time.

All books reviewed on this page are loaned for review by
McGills Newsagency, Elizabeth Street, Melbourne.

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It would be appreciated by the Editorial Staff if readers
would drop a line expressing their opinion of this feature.

Alec H. Glyne

- Review Editor.

.. SLOUCH HATS & FORAGE CAPS ..

Believe it or not ... the yf went to a school concert t'other night and one of the items was called "Slouch Hats and Forage Caps." Guess we will have to take out a copyright soon, Hi!

Well, well, when you chaps read this it will be 1944, so first of all A Happy New Year to all of you hams VK, Ws and all the rest, and may this time next year find us dusting off the old rig for a little bit of surely nobody said... "pirating" !!! Oh well, see you on 7 or 14 mc. Hi!

Had a letter from VK4RF after he had made a couple of tours up where the yanks are pretty busy, and as usual he finds some notes to fill up the page.

"VK4EL sends in the following via 4RF...RB is acting Foreman at National Station 4QN, near Townsville. 4FK, 4AN, 4LW, 4HC, 3IV, and 5IV are also working in National Stations in Qld. 4EL cycled over 25 miles to see his old pal 4RF, chowed the rag till midnight and then rode back all that way without a light. If that isn't the true HAM Spirit, what is???

Met W9YRL at 4CA Cairns recently and had a good yarn in 4CA's Studio...hope none of it went over the air, Hi!...3RY's brother and 2ACU's brother now help 4RF out on the "Manoora". "Truly this Ham Spirit is a contagious disease, Hi. (2YC)." VK2CT at present "war up north" and we wish him the best of luck....he'll need it....

As for 4RF well, he's on 14 days leave with the yf and baby daughter in VIB, and inbetweentimes he looks at the nice lot of gear he is gradually acquiring. The boys on the ship swear blind that they heard morse coming out of his suitcase when he was carrying down the gangplank on shore leave...." Pretty good Fred, om, even for you. Hi. 2YC.

VK2AKA, VK2AKA, VK2AKA de VK3AH....anybody knowing where 2AKA is, please advise via 2YC or direct to 3AH P/O A. Miller Group 599 RAAF Mascot.

Flying Officer Gordon Bridgen 2ACT was one of those early birds of the Empire Air Training Scheme, starting as an AC2 and taking the long road to a Commission. He graduated in Canada and first served in Bomber Command, then saw service in the Middle East and now is one of forgotten men of the R.A.A.F. in India.

2AMS F/ o Keith Avery recently joined the happy band of Benedicts, taking for his bride a Queensland girl. All the best for the future, om.

Captain Fred Carruthers 2PF is the proud father of another baby daughter. I believe the Acting C.S.O may be seen sometimes, these days getting round the house in an apron, looking after the "3" Beans.

2AMQ Jim Haining fought a fight with a tank coil and came off second best...reckons that the first 1500 are the worst. Hi.

2UX, an ex VK2 President is wandering round VIC on "leave". He is a ball of muscle now he no longer carries all those gallstones around.

Ray Jones of 3RJ still sits in his office or RAAF Eastern Area and keeps a watchful eye on his many WAFF's. But the place is very efficient I am told, and PMG ideas can be seen around the place. Hi. He will be a good NS Welshman when he gets back to Box Hill.

Dear, of dear...more trouble. Hi! What I want is three liason officers, one for each of the Services, and then I will not (perhaps) make so many mistakes???? Poor old Jim Korley, a Petty Officer way up in Darwin and a post master of sorts (I trust better than I) and yet I put him in the RANVR when it should be the RANR. Now I ask you isn't V for Victim Valour and Victory, so what more does he want. Hi! Jim, anybody sending me news can't escape being the first. Hi! Oh, well lest he send no more notes, I must humbly apologise on behalf of the Editor, (who should have known better). The lad seems to have had his share of the fun, just listen to this. During the past four and a quarter years he has visited North Borneo, Hong Kong, Yokohama, Singapore, Cocos Is., Mauritius, Capetown, Freetown, United Kingdom, Canada, U.S.A., Honolulu, Pago Pago, Fiji, NZ., and back home. In Hong Kong he picked up a nine tube Haalcrafters Communication Revr for the equivalent of £15/10/-. He had it working for two years aboard ship and it still functions OK. On reaching the United Kingdom the first chap met was a ham from Hull G2FL (?). He was a Customs Officer and being imbued with the right Ham Spirit, it was no trouble to get permission to take the above revr on shore during the five weeks leave. Harry White 3IR. Ken Allen 3UH and Cedric Marley, a VK4 were also on Jim's ship. The Northern Ireland section of the RSGB & its members gave the boys a marvellous time and their stay in Belfast was something to remember.

His trips ended with a voyage as a 1st class passenger guest of the Matson Company, just judging his return to Sydney to arrive the day the Japs entered the war...and now he sells stamps in Darwin... have you "retired" Jim?

And here's another complaint, this time about the Melbourne weather...and by a VK3 too....It appears that 3XZ's leave day usually falls on a Tuesday...XZ's complaint is that for the last 13 Tuesday's it been wet...and he's trying to build himself a garden. Mac is now wearing three stripes.

It is with much regret that we announce the passing from these pages one Harry White 3IR...after many many weary months of trying he has at last succeeded in obtaining his discharge from the Navy... reasons....Medical????????????????????

3MV has been located in VIM. According to Jack its a very monotonous job guarding convoys....He still thinks that the Navy should head these pages...but as it was pointed out to him that the Navy was a Silent Service there was no need for them to be represented.

Happy New Year OMs and don't forget 1300GMT "when the dust comes off." Hi.....2XC

D I V I S I O N A L N O T E S

- NEW SOUTH WALES DIVISION -

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The December General Meeting of the Institute was held at Y.M.C.A. Buildings on Thursday 16th December. It had been decided previously that this Meeting would take the form of a Social Gathering and formal business would be disposed of promptly. The night was an outstanding success due entirely to the efforts of Russ Miller who assumed charge of the catering arrangements. Although this was our first attempt at making the Christmas Meeting a festive occasion it goes without saying that it won't be the last. Russ was more than worthy of the very hearty vote of thanks accorded him at the conclusion. 3AJ's contribution was very much appreciated and I'm very sorry more of those present couldn't have participated!

Members were informed that £4/0/6 was on hand for the A.C.F. "Adopt a Soldier" Scheme and that if £1/3/6 could be obtained another two Servicemen could be added to the number already being provided for by the Division. This amount was forthcoming in a very short time and VK2 is now helping to support 8 Servicemen.

An interesting visitor was W3DOT Frank Hogan who expressed surprise at the amount of interest taken and enthusiasm shown in Experimental Radio as evidenced by the Meeting. He felt that he was quite sure in saying that nowhere else in the world today was interest so keen. Coming from a Yank, that statement is worth noting.

A very welcome visitor was Pt. Lt. Goyen VK2UX who prior to joining the R.A.A.F. was Divisional Chairman. In a few well chosen words he congratulated the Executive on the splendid work they were doing and stated that the Institute was held in high regard by Servicemen everywhere.

At the conclusion of General Business the meeting was given over to the most interesting part of the night's proceedings namely "Eat's" and reminiscences of the "good old days." Qsl's were passed round and autographs and "Post War Re-Construction" was the subject of many hams present.

The next Meeting of the Division will be held on Thursday 20th. January and all Amateurs are invited to be present.

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EMERGENCY COMMUNICATION NETWORK

.. Sydney Raided by "Hostile" Planes ..

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"State Operational Control calling Deputy Controller, Wireless. Air Raid Warning, Yellow. Time 9.02 a.m. Please repeat."

This brief telephone message on Sunday 12th December intimated that State Control had received a message from Fortress Command that

suspicious aircraft thought to be of enemy origin had been sighted and therefore it became necessary to warn key personnel.

At 9.15 a.m. the sirens (?) sounded the "Alert" and this was the signal for all E.C.N. personnel to man their stations in the shortest possible time. The first station to be manned was VL2JE only thirteen minutes after the "sounding" of the siren. JE was quickly followed by JJ, JK, JC, JE and JP in that order.

At 9.30 a.m. the "Raiders" struck. Coming in two waves, the first over Rose Bay and the second from a more northerly direction, they pressed home the attack with a suicidal frenzy and despite heavy fighter opposition and ack-ack fire quite a few bombers - who were carrier borne - managed to reach the targets.

At 10.06 a.m. VL2JC had the honor of transmitting the first message since the Network has been actively associated with the N.E.S. This message - a routine report of Casualty allocations made history for Amateur Radio in Australia, or perhaps in the world. Since the outbreak of war, many countries, particularly within the British Empire, have tried to interest the powers that be in Radio for Civilian Defence. However, other than the U.S.A., Australia is the only country that has succeeded. The lads associated with VL2JC - Gordon Cole 2DI, Eric Fugh 2ADK, Phil Cox, 2IE and Bill Dukes 2WD have done an excellent job. They did not have an easier passage getting the station going, but by dint of hard work, adaptability and a few good Australian words at times, their efforts were at last crowned with success and no operator will begrudge them the honor.

To continue the story. From 10.06 a.m. routine casualty reports from the various stations kept coming in until about 11.00 a.m. the hospitals attached to the various Ambulance Controls were overcrowded and it became necessary to ask for assistance. Between 11.09 a.m. and 11.51 a.m. no less than 29 messages were handled!

Eventually the "Raiders" were driven off. Only five planes out of fifty succeeded in eluding the fighters and ack-ack fire, and at 12.31 p.m. the "All Clear" was sounded and operators permitted to close down their stations.

In retrospect the Exercise was an outstanding success as far as reliable and efficient Radio Communication was concerned. In all, 82 messages were handled between 9.38 a.m. and 12.32 p.m., each message is checked back by the receiving station as well. 50 Service messages were handled between 10.06 a.m. and 12.17 p.m. with the real blitz between 11.09 and 11.51 and during that period Control was in constant operation.

During early discussions with N.E.S. that Department asked for a maximum of 20 messages per hour and then revised this number

and asked for 16. The message handling rate on Sunday 12th December was forty per hour!

Both the Director and State Operational Controller, N.E.S. have expressed satisfaction with the manner in which the Network functioned. The next Exercise will be held early in the New Year and this will be a Test for Communications and it can be stated with certainty that the Network will have a much bigger job to do.

No Message Handling Competitions have been held during the last two months, but these will commence during the first week of January, when it is anticipated that - believe it or not - the Auxiliary Power Supplies will be available.

VL2JC...Did an excellent job, but we've had quite a lot to say about them previously.

VL2JE...Decided to start on the same frequency much to the relief of those at VL2JB. It is understood that the VL telephone operator was quite fb. Remember chaps, when you have comments to make, forget the kindergarten stuff.

VL2JJ...Could not be faulted. Nuff said!. By the way Arthur, what is the octane rating of that motor spirit you used!

VL2JK...Also did a good job. Ken Davidson and Charlie Chenhall will make a couple good hams when it's all over. ZEH is very fortunate in having such assistants. Hope the new one will be as good.

VL2JL...Oh where, oh where has my puppy dog gone? I mean, where were the gang between 9.28 a.m and 10.10 a.m. Spoilt a great performance. Was it the VL's in the D.A.C. George?

VL2JP...Did a good job, but unfortunately did not have much traffic to handle. Got a bit worried about 10.30 when they were finger-printing about six girls from the Home. Too bad these boys are all young married men. Better luck next time, "Shorty."

VL2JB...Congratulations to the operators at Control, particularly Len Burton, who although not yet a ham, handled traffic like a veteran and refused to get ruffled when things were hot. There is absolutely no truth in the rumor that Charlie Ffarr bought the Sundial in the Gardens in an endeavor to learn to gell the time!

.....xxx.....

V I C T O R I A N D I V I S I O N

.. HAMS! WHAT DO YOU EXPECT OF POST WAR HAM RADIO? ..

It's not too early to start planning for the future, and every Ham will want to have a say as to what should be done when our licences are restored. The Council of this division has therefore decided that the March 1944 meeting be devoted to a full, open and frank discussion of ideas on all phases likely to affect the future of Ham Radio in Australia.

We invite all those interested who are in Melbourne of the 7th of March 1944 to attend and EXPRESS THEIR VIEWS, and those who are away from home, particularly men in the services, to let us have their views in writing so that we can read them to the meeting.

As an act of Federal Parliament is needed before Hams can operate again in this country, and remembering that Hams were suffering more and more restrictions with each International Convention, it is not hard to believe that strong reasons will have to be put forward to back up our claims for restoration of our licences.

We believe that this discussion, which may extend over two or three meeting nights, will lay the foundation of any scheme that may be devised to support our claims. So please remember the date.. ..TUESDAY, 7th MARCH, 1944....and bring or write your ideas.

Readers are reminded that these meetings are not restricted to members only....anyone interested in Radio or associate industries are always cordially welcomed to meetings.

It is with much pleasure that we welcome back to this page Harry White 3IR. After serving for some years with the navy, it must be a change to get back into civies....For everyone's information, Harry is now to be located keeping 3XV's transmitter on the air. Someone whispered something about a VL...I don't know whether or not it's really an XYL????

The matter of the Licencing of Radio Servicemen occupied considerable time at the last meeting. As it has been announced in the papers that this scheme is to come into effect in the near future, and as yet the position of Amateurs in this State has not yet been clarified, it was decided to write to the WOI in this State asking them to clarify the position of the Hams.

We are pleased to welcome as new members of this Division Captain E. Foster of LHE heavy Wireless Group, and Mr. Richardson.

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THE WIRELESS INSTITUTE OF AUSTRALIA



Divisions of the Wireless Institute of Australia exist in every State of the Commonwealth. The activities of these Divisions are co-ordinated by Federal Headquarters Division, the location of which is determined from time to time by ballot.

Present location of F.H.Q. :— New South Wales

Federal President : F. P. DICKSON, VK2AFB.

Vice-President : H. F. PETERSON, VK2HP. Federal Secretary : W. G. RYAN, VK2TI.

Councillors : C. FRYAR, VK2NP ; W. J. McELREA, VK2UV

Official Organ : "AMATEUR RADIO"—Published by the Victorian Division.

VICTORIAN DIVISION

191 QUEEN ST., MELBOURNE

Postal Address : Box 2611W, G.P.O.

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191 Queen Street.

Visiting Overseas and Interstate Amateurs are welcome at meetings and they are invited to communicate with the Membership Secretaries :

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The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and on invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

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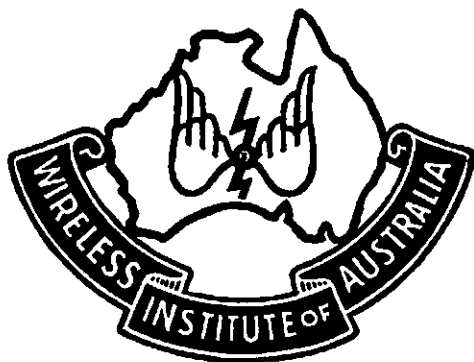
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SIXPENCE

FEBRUARY 1944

AMATEUR RADIO

THE
OFFICIAL ORGAN
OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA



Published by the Victorian Division

AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol. 12 No. 2

February, 1944.

AN INTRODUCTION TO SIGNAL TRACING.

.. Frank Cross VK2FX ..

PART I

Calling all Hams! Your attention is drawn to a new field in Radio Servicing, namely Signal Tracing. This new method of tracking down trouble in receivers and in fact, any piece of equipment which uses Radio or Audio frequencies, is as far in advance of our usual methods of "hunting and hoping," as the multimeter is over shorting the H.T. to ground with a screwdriver and measuring the spark with a blacksmith's rule.

Signal tracing was introduced in America by that King of servicemen, John Rider, about 1939 and would have long ago claimed your attention but for the War. Rider's book on the subject, entitled "Servicing by Signal Tracing" is recommended to the gang for general consumption, as it not only explains this subject fully but also gives excellent information on what happens to the signal and all its tricks in travelling from the antenna to the speaker in every type of receiver and where the sigs hide out in control circuits. Every Ham that can read English can understand Rider, as he leaves nothing to the imagination. (I have NO shares in the Rider Publishing Company.)

Signal tracing is the act of listening to and measuring the frequency and intensity of the signal from the antenna post of the receiver, to the voice coil of the speaker. The instrument used for the purpose is a tuned vacuum-tube voltmeter in addition to an audio amplifier with some output indicator. Now don't get down under the table! The tuned VTVM is simply a TRF covering the frequencies desired and operating an electric eye, and the output indicator can also be an electric eye with a rectifier, parked across the plate circuit of the audio output tube. However more about the instrument later.

Let us have a look at an ordinary superhet (Fig. 1) and by following the signals through the various stages, we can get some idea of the advantages in having an instrument, to listen to, and measure the frequencies and strength of the signals.

We tune this receiver to a signal on the broadcast band, say 1000 K.C.'s. The 1000 K.C. signal will appear at the antenna post

with all the other signals on the band, as at this point there is no selectivity. At point 2 we expect an increase in signal voltage, due to the step-up ratio of the antenna to grid transformer, while at point 3 the signal is increased about 40 times due to the amplification of the tube. On the grid of the converter tube, point 4, another slight rise occurs because of the plate to grid transformer, and passing on to point 5 further amplification has bumped the signal up again. The gain of the converter is not as great as in the case of the R.F. tube as its plate circuit is tuned to 465 K.C. assuming that is the I.F. frequency used.

At the plate of the converter, three other signals appear in addition to the 1000 kc signal namely, the oscillator signal at 1465 kc, and the sum and the difference of the signal and oscillator frequencies. Of these four signals the oscillator signal is by far the strongest, the difference frequency follows (i.e. the 465 kc beat) then the signal frequency (1000 kc) and last in the strength scale comes the sum frequency (2465 kc.) because as the plate circuit is tuned to 465 kc the impedance presented to the sum frequency is low. Anyway, who cares? The 465 kc. beat is the one we want now so let us see what it is like at the grid of the I.F. amplifier, at point 6. Here the 465 kc signal should be the same strength as at point 5, as the transformer ratio is usually about 1 to 1, and at point 7, the signal increases about 30 times due to the amplification of the tube. A drop is expected at point 8 as the plate to diode transformer has a step down ratio to match the lower impedance of the diode.

Going on to point 8 we find a much reduced 465 kc. signal, owing to the effect of the condenser across the diode load resistor. At the same point we have the first appearance of the audio signal, thanks to the rectifying properties of the diode. (In better designed receivers, a filter is used to prevent the 465 kc. signal from getting into the audio amplifier, instead of relying on condenser "C" to do the job.) The signal at point 10 will be as loud as the signal at 9 or less according to the position of the moving arm of the potentiometer used as the diode load resistor. At point 11 we should find the same strength signal as at point 10, but at point 12 an increase is to be expected the amount depending upon the gain of the tube used, and the same amount of audio should appear at point 13. Some increase in signal voltage will be had at point 14 but as the output tube is a power amplifier it will not give as much lift to the signal voltage as a voltage amplifier. A decided drop in voltage will be apparent at point 15, because of the stepdown ratio of the speaker to voice coil transformer. The voltage step down can easily be ascertained if the impedance ratio is known, as the voltage ratio is equal to the square root of the impedance ratio.

Those of you who are still reading, will readily see the great advantage of having an instrument, to listen to and measure the frequencies and intensities of signals at the various points in the receiver when looking for faults. If a signal appears at any of the bypassed points in the circuit, it means that the condenser at that point is ineffective and is in need of replacement because it is either open circuited or not large enough for the job. On the other hand, if a signal does not appear where it should, at the correct

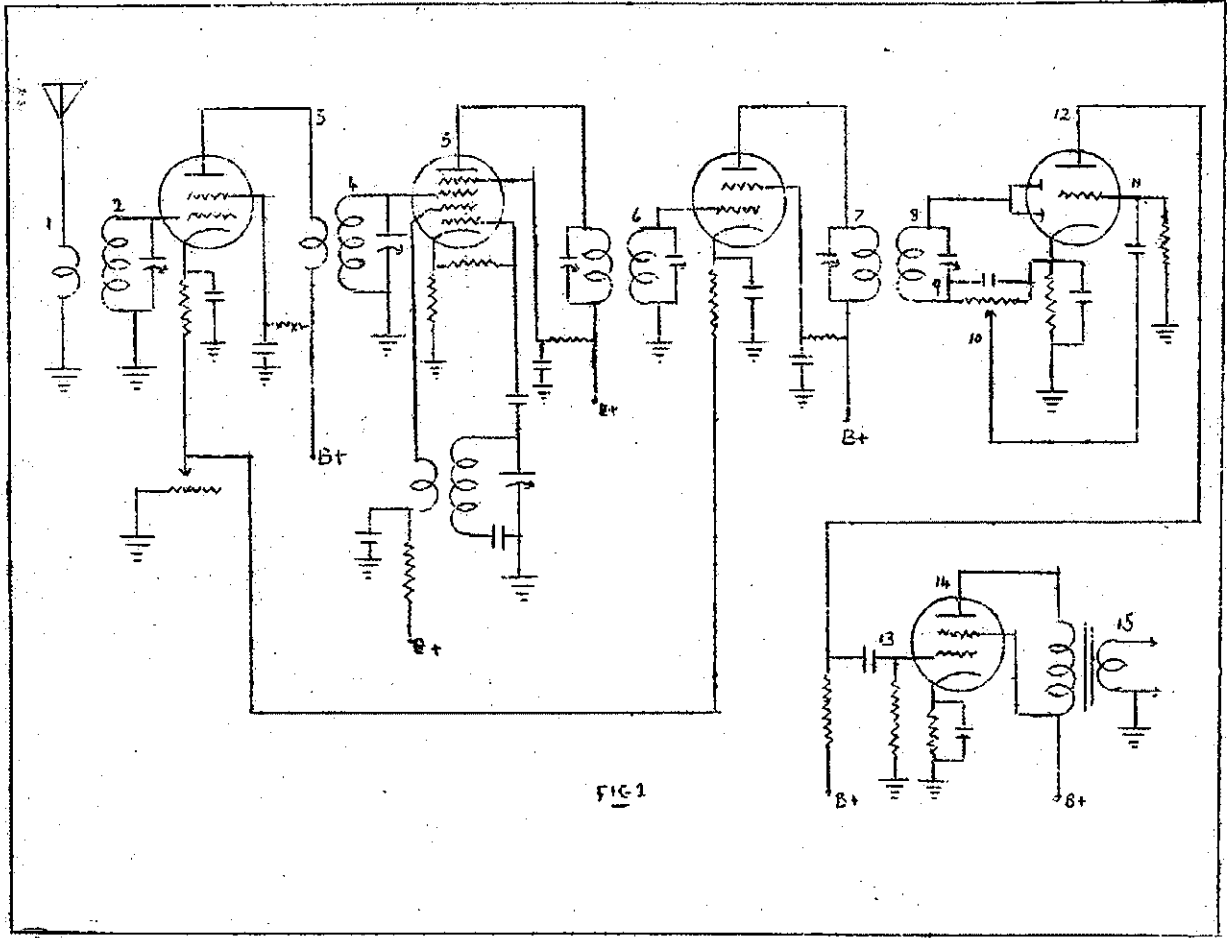


FIG 1

strength and frequency, the point where the signal departs from normal can be attacked with the multimeter for shorts, or voltage, current and resistance upsets. Faults such as shorted turns in R.F. transformers, variations in oscillator frequency, resin cored joints, intermittent condensers or other component parts, oscillation, motorboating, noise or faulty alignment of ganged stages can more easily be traced with this than any other method. In fact it will track down anything but a "Pirate" using your call!

.....000.....

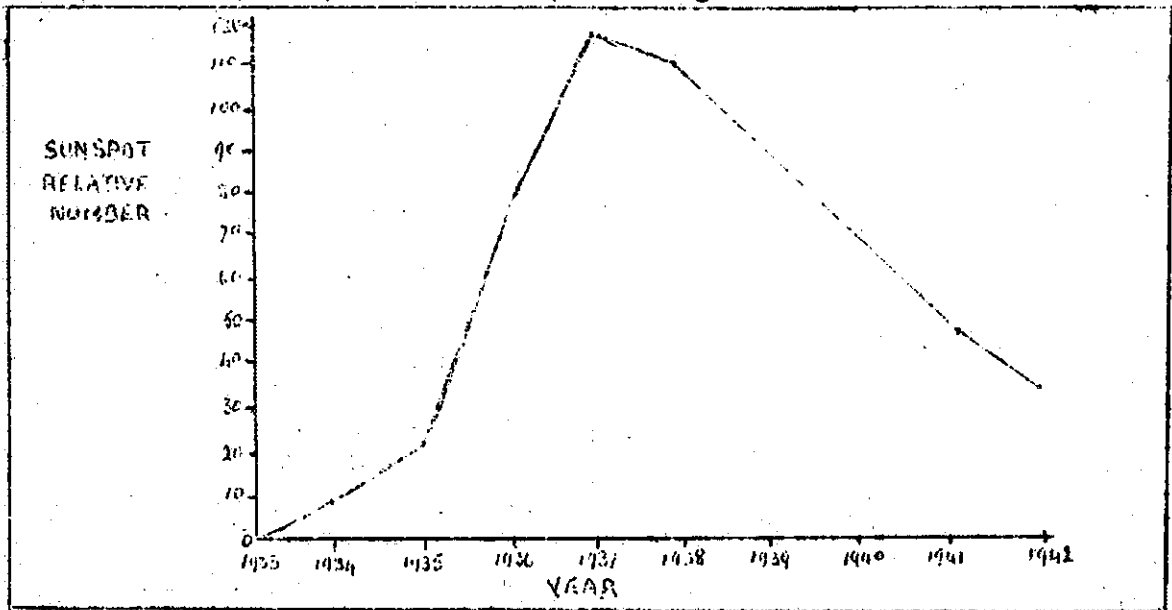
SUNSPOTS --

CLOSE OF THE PRESENT CYCLE

It has recently been announced that a sunspot group has been observed in the relatively high solar latitude of 32 degrees north. This may have been the first sunspot belonging to a new cycle of solar activity, and its appearance is therefore evidence that the end of the present cycle was predicted to be in 1944.

The cycles of solar activity are of significance in radio in that the amount of ionisation produced by the sun in the upper atmosphere varies in phase with them. Thus the critical frequency of the ionosphere layers is much higher at sunspot maximum than at the minimum, & consequently higher working frequencies must be used for short-wave transmission at the former period than at the latter.

The present solar cycle commenced in 1933 and its progress as seen in the graph in Fig 1 would seem to indicate that it would come to an end about 1944, but precision on this point is by no means easy, since the cycles vary very considerably in length.



Besides varying in size and the frequency of their appearance the sunspots also change their latitude as the cycle progresses. At the beginning of a cycle they occur on the solar surface in two belts

(Continued on Page 14.)

.. 34th ANNUAL REPORT ..

WIRELESS INSTITUTE OF AUSTRALIA

- New South Wales Division -

To be Presented at Annual General Meeting to be held at Y.M.C.A.
Thursday, 17th February 1944.

Gentlemen:-

In placing before you the 34th Annual Report of the Wireless Inst. of Australia, New South Wales Division, your Council are of the opinion that this Division of the Institute is the most active Experimental organisation in the world today. This happy state of affairs has been brought about by the wonderful enthusiasm shown by members and the splendid co-operation given to Council at all times.

Obviously the most important happenings during the year under review are the activities of the Emergency Communication Network. The Net was originally formed to work in conjunction with the State War Effort Co-Ordination Committee, but unfortunately that particular organisation ceased to function as an A.R.P. body early in 1943. For quite a few weeks the future of the Network hung in the balance. It was felt by Executive Members of the Council that if the Net was disbanded, Experimental Radio in Australia would receive a great setback. Eventually through the efforts of Messrs. Priddle and Ryan, the Department of National Emergency Services became interested and that body asked for a Report on the possibilities of the Net as an efficient means of communication. This report was made by two independent Radio Experts. It was an adverse one. Quite frankly, it was deserved. One of the greatest difficulties that the Technical Committee had to overcome was the fact that quite a number of operators attached to the Network either would not or could not get away from the idea that they were still "hamming." A plea to with-hold a decision was made to N.E.S. and was granted. In the meantime the whole position was placed before the operators and they decided to make an effort to bring the Net up to the degree of efficiency worthy of the W.I.A.

As a result the independent Committee were asked to again report on the Net and this time it was a favorable one, so much so that N.E.S. decided to make use of the Radio. In addition the sum of £1000 was set aside to implement the Service. A Wireless Committee, under the Chairmanship of the State Operational Controller Colonel F. Lorenzo, D.S.O., comprising Messrs. Wetherill (R.I.'s. Dept.) Sergeant Raynor VK2LJ (Police Radio) Ryan & Priddle (W.I.A.), was set up, and at its first meeting W. G. Ryan VK2TI was appointed Deputy Controller, Wireless. This appointment meant that a Member of the Institute was in complete charge of the National Emergency Services Wireless Net. In addition Messrs. Fryar VK2NP and F.P. Dickson VK2AFB were appointed Wireless Training Officer and Technical Officer, Wireless respectively. It should be mentioned at this stage that the Divisional Chairman R. A. Priddle VK2RA intimated that he was not in a position to accept any appointment.

The changeover from S.W.E.C.C. to N.E.S. meant that the whole Operating Procedure and Forms had to be changed, but operators were not discouraged and went to work with a will. On Sunday 12th December the Net participated in its first N.E.S. exercise, and came through with flying colors, so much so that the Director of N.E.S. has decided that much greater use will be made of Radio in the future. Originally intended to come into operation when other means of communication had failed it will now implement, and in some cases, eliminate some other methods.

In order to maintain interest and efficiency a Message Handling Contest was instituted and a Cup given for the best Station. VL2JI under the leadership of C. Fryar VK2NP, won the first trophy and a new Cup is now being competed for with VL2JL at present enjoying a small lead.

Reviewing the activities of the Network from a personal angle it is difficult to single out any particular individual or station for praise but before leaving Network activities I would be failing in my duty if I did not mention the fine amateur spirit shown by Vice President E. Hodgkins in providing a service from a location that was quite a long way from his place of abode. The operators at VL2JE are also desiring of praise for the manner they stuck to their task. Reception difficulties cropped up and at times it was difficult for this station to receive Control, but despite this difficulty VL2JE was always manned, even though this meant at times that the operators would have nothing to do for about two hours.

Federal Headquarters completed a two year period in this State during November and when the question of location was put before the various Divisions or State representatives, they were unanimous in asking New South Wales to again act as Headquarters Division for further period of two years. Nominations for the new Executive were called for and received and a ballot duly held which resulted as follows:-

Federal President.	F.P. Dickson VK2AFB (unopposed)
Federal Vice President	H.F. Peterson VK2HP
Federal Secretary	W.G. Ryan VK2TI (unopposed)
Executives	W.J. McElrea VK2UV
	C. Fryar VK2NP

Newcomers to the Executive are Messrs. Dickson and Fryar who replace Messrs. Priddle and Gough. It was unfortunate that the retiring Federal President did not seek re-election. In taking over the responsibilities of Headquarters Division in 1941, Council of that day took the step with no little trepidation in view of past history. In 1941 the Federal Executive as a body was comparatively unknown, but during its term of office under the able guidance of R. A. Priddle VK2RA it soon brought under the notice of Australian Experimenters the fact the Institute was still an active body, more than capable of looking after the interests of the Experimenter during wartime as it was during the days of peace. 2RA can be

ill spared and it is hoped that at a later date his services will again be available. A mark of appreciation is also due to N. Gough VK2NG for his devotion to duty and the able manner in which he carried out his work as an Executive Officer.

During the year the well being of the Amateur on Service has not been overlooked. No less than £18/12/6 has been subscribed to the Wireless Institute of Wireless Prisoner's of War Fund. In addition to supporting this Fund the "Adopt a Soldier" scheme sponsored by the A.C.F. has been supported by the Division. £20/16/- has been collected to date - sufficient to keep eight Servicemen in comforts for twelve months.

The official organ "Amateur Radio" has been well supported during the year, and the amount of copy submitted to the publishers has been far in excess of that which could be published. Although the passing of the "Monthly Bulletin" left a gap in VK2, it is fully realised that the sacrifice was worth while, as the magazine can now be said to be worthy of the W.I.A. On a technical basis it compares more favorably with any other Experimental publication in the Amateur world today. A meed of praise is due to the Magazine Committee, particularly Messrs. Marsland and Hogan for the splendid work they are doing. Let us hope that the day will soon dawn when it will be possible to again publish the magazine in its printed form. The relations existing between the Magazine Committee and this Division have been most cordial, and it is confidently expected that they will continue in this manner in the post war era. Before leaving the Magazine, J. Corbin 2TC must be congratulated upon the "Slouch Hats and Forage Caps" page.

During the year quite a number of overseas visitors have been in attendance at General Meetings or have been entertained by various Members. It was decided to have some form of souvenir printed for presentation to overseas Amateurs and this souvenir eventually took the form of a very attractive Certificate of Honorary Membership.

The possibility of reviving the Annual Dinner was suggested to Members, but although a large majority were in favor of the Dinner being held unfortunately very few Members could say definitely that they would be present. Under these circumstances it was decided to leave the matter in abeyance, but in place of the Annual Dinner the December General Meeting took the form of a "Pound Night" and was voted an outstanding success. Thanks are due to Councillor Russ Miller for the able manner in which he organised the evening and it is confidently anticipated that all Christmas Meetings in the future will take this form.

Membership throughout the year has continued to increase. During 1942 a considerable influx of members took place due to the formation of the E.C.N. The majority of these newcomers have retained their interest resignations being very few - newcomers quite outweighing those who have dropped out.

This, gentlemen, covers the activities of the Division during 1943, and at the conclusion of each annual Report during the war years, it has been customary to express the wish that the incoming Council would have the opportunity of moulding Post War Experimental Radio. This time more than ever before, it can be safely said that that day is very very near. What does the future hold? At any gathering of hams these days the subject of amazing advances and their application to the Post War Amateur are discussed. Here a word of warning should be sounded. It is true that many amazing developments have taken place in that extension of Radio known today as Electronics, some of which we have a slight knowledge of like R.D.F. Radio Navigation and Homing devices, but after all the Amateurs main interest is and has always been "Communications." In this field it is quite safe to say that no really "amazing" developments have taken place although aerials have been developed to a very large degree. Then again, when we are back on the air should we expect "the doors of military secrecy to be thrown wide open?" The answer is no. In the words of Clinton B. DeSoto "Let us look forward to our restoration to the air as an opportunity for tackling anew those problems which are still unsolved....We'll be better equipped than ever to do the job...the intense educations our members in the Services are receiving alone will be a significant new asset."

The future of Experimental Radio is particularly bright, and in view of the splendid part played by the Amateur on Active Service and in Civilian Defence there does not appear to be any reason why the Amateur will disappear, but just what portion of the Radio Spectrum will be allotted to him is difficult to say, but one thing is certain, Commercial interests will endeavor to obtain as much of the useful part of the spectrum as possible. Therefore it will be necessary for the Experimenter to be organised. Remember, if the Institute had closed down as it did in the First World War there would have been no E.C.N. during this War!

What of the Institute in the New Era? It is quite safe to say that the number of Experimenters in Australia will be doubled if not tripled or even quadrupled. Up to June 1943 no less than 135 applicants for the A.O.C.P. had been successful in obtaining the "Ticket" With the cessation of hostilities, it is certain that there will be thousands of young chaps, yes A.W.A.S! W.A.A.F.'s and W.R.A.N too who will be anxious to keep up their new found interest in Radio per medium of the Amateur Bands. Therefore, the Division should commence to organise now. Firstly a cash reserve should be built up and with this object in view consideration must be given to raising the present particularly low rate of subscription. Another very important question must be the employment of a paid Secretary. If the Institute is to expand, and expand it must, it will be possible for any individual acting in an honorary capacity to do justice to the position. After all, the really large Amateur organisations viz., R.S.G.B. and A.R.R.L. have paid officers and the N.Z.A.R.T. had carried a proposal to this effect just prior to the outbreak of war.

R. A. Priddle VK2RA Retiring Pres.
W. C. Ryan VK2TI " Sec.

TECHNICAL LIBRARY

A page of book reviews conducted for the benefit of
Hams in the Services, and others similarly situated.

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BASIC RADIO...J. Barton Hoag, US Coast Guard, 1942...379p, 27/ 9

The alternative title...The Essentials of Electron Tubes and their circuits...is more apt for this book, since there is much in the subject matter which is not within the scope of radio. This is the sort of book which can be read like a novel, furthermore it is one which a layman could follow without difficulty so clear are its explanations, yet we feel sure the majority of Radio Engineers and Hams could learn much from it.

Apart from the usual fundamentals, presented very attractively, Amplifiers, Oscillators, Detectors, Gas Filled Tubes, PE Cells and C. R. Tubes are discussed. The remainder of the book also deals with the usual subjects, but interspersed with these are some very interesting details of Feedback Amplifiers, some special Circuits and Microwaves. The chapter on Special Circuits includes amongst other things Frequency Dividers, Pulse Sharpening Circuits, and a Circuit for producing two figures on the screen of a Cathode Ray Tube at the same time. This chapter leaves one wondering whether there is anything that cannot be done with the aid of vacuum tubes. We can recommend this book as a valuable supplement to the more conventional volumes of the Ham Bookshelf.

RADIO RECEIVER CIRCUITS HANDBOOK...E.M. Squire, London. 2nd Ed.
1943...104 Pages.....8/3d.

An interesting little book, not very advanced, but should be of use to those who want a general idea of standard circuits in modern receivers. Apparently written with that idea in mind, it goes just far enough, giving as it does all the more or less standard arrangements and values of components as found in conventional Broadcast Receivers.

FUNDAMENTALS OF RADIO...P.E. Terman...New York. 1st Ed. 1 938
458 pages.....31/10d.

Just that and no more, but no less. As we have come to expect from Prof. Terman. It is well done, and worth having when you find you have forgotten that basic point and want to look it up. Unusual in a book of this kind is a chapter on Acoustics. Most authors seem to shy clear on this subject, which for certain purposes may be very important.

Being pre-this-war vintage this work lacks references to such recent developments as Micro-waves, but it is probable in any case that such subjects can be adequately covered only in separate manuals.

All books reviewed in this page may be obtained from McGills Newsagency, Elizabeth St., Melbourne.

... A. H. Clyne....Review Editor.

SLOUCH HATS and FORAGE CAPS.

January finds all our correspondents in the doldrums, and like the ham bands in the summer this column has been a bit neglected for the month.

The VK2 Div., had an Airgraph from G2YL in which she gave "Snow" Campbell's new address which appears, from her remarks, to be in Poland. Wonder if Snow finished his wireless course, the one, you may remember he was giving to several hundred prisoners without the aid of a single book. Has anybody any news of any other lads who are prisoners? VK2AKE was also in Italy but in a different prisoner camp than Snow. The luckiest prisoners seem to be those who made Switzerland.

VK4RF is on his way to VK3 to do another course. Fred was at the last VK2 Divisional meeting. It was the first time he has managed to be in VIS when our meeting was held though he has made many trips to Sydney during the time he has been at sea.

VK3 was also represented at the Divisional meeting in the person of Petty Officer Frank O'Dwyer VK3OF. Frank turned up at 2YC's just at tea time and it was a pretty hectic business trying to make the meeting in these days of few trams, fewer buses and just about no taxis, Hi!! Frank was on one of our ships that shelled the beach before the landing on Cape Gloucester, and his talk to the meeting was humorous and interesting. Incidentally the Ws were also represented in this show by at least one W6 on a destroyer. Frank hopes to be in VK3 in Feb., for some "well-earned" (so he said) leave.

Wilf Harriss VK2alf was spending his leave at one of our holiday resorts in what I believe is a typical naval relaxation...horseriding. As Wilf grew up in the country he can "stay on" in case you are wondering. I believe he goes on to the Admirals' Staff soon...whatever that may mean. There is no news of 6IG (I think it was) who is also on the ship.

Roger Torrington, 2TJ seems to still stay around the quiet spots after his hectic time up north as his latest QRA is Essendon.

F/O Jack Howes 2ABS gives the following description of his five weeks old jnr op...a boy, too, mark you.

"Frequency...500 to 1000 cycles

Power output (audio) approx 2.5 Watts

Note...T9x with slight commutator ripple

Polar Diagram... Essentially non directional, but considerable end effect. Jack has yet to find out his opinion of the essential question..."Phone on forty at night." Hi!"

Reg Morgan VK2ABM reports from No. 3 Mess HMAS Cessnock. He is somewhere overseas, so your guess is as good as mine. If you in the navy meet up with the Cessnock a good welcome from 2ABM is assured. As he took part in the Sicily landing you will have to go a fair way to get that welcome. Being a silent member of the silent service that is all he tells about his "doings".

W/O Jim Perooz come to light with some news of his whereabouts. After much touring around he now gives his QRA as with the RAAF at Lowood, Q. Glad to hear from you Jim, after all this time, wondered just where you are. At the moment all the RAAF seems to have just disappeared into the blue, as far as VIS is concerned.

Ldg. Tel Sid Clarke seems to have reached his destination in N.G. and at the moment is short a Power Transformer and, more so, gramophone needles. The supply of these is so low they have to keep sharpening those they already have. So if anybody knows where there is a corner in needles shoot them on to me and I will send them on. (Secondhand ones quite O.K. sez Sid). I think extracts from Sid's letters give a better idea of his doings than I can... "So far I have only met one Ham. Strange as it may seem there IS one in the Navy with Commissioned Rank, VK2CS.... Have been here a whole fortnight and have yet to see a woman... black or white. I think that is the main reason the pictures are so popular. Dotty Lamour has a very good following but I think Ginger Rogers runs a close second. Some of the shows are quite old but we don't mind that. Rain is always expected too, so we are not disappointed if it does come down and "Bramac" capes or combination ground sheets and capes keep us dry. One I went to late last week was expecially damp but since Dotty did not pack up and go home none of us went either...."Wal Ryan tells me he has another letter so more news next month.

My asking about VK7s did produce some results. 30J and 2TI both send me a little dope. Dr. Kelly writing to Herb 3JO says he is doing this between patients...which sounds like 2YC's place...I usually type this, as now, between Midnight and 2.30 am...as its the only time there seems to be any time?????. Takes me hours to type two pages with the one finger. The Doc mentions Peter Allen 7PA and Paul Jones 7PJ as being interested in their EGN Network over there, besides 7XL Joy Batchler, 7KV Valentine and 7AR Carl Johnson. So that covers some of the "Sevens" we haven't heard of since the war began.

VK7LZ gives us another short list from Launceston and thereabouts. He reckons that of those who were around there prior to the war only himself and 7BQ are left, the others either have shifted locality or being in some way connected with the War. He encloses the following list.

VK7KR	now with	R.A.A.F.	Darwin
VK7RK	"	A.I.F.	"Up North."
VK7HY	"	A.I.F.	"Up North."
VK7LG	"	Merchant Navy	
VK7DS	"	A.I.F.	9th Div.
VK7GS	"	Munitions	in Hobart

Any further notes of these and other VK7's will be very welcome, oms.

Well, as usual last paragraph...usual "winge" WHERE ARE THOSE NOTES???? Don't tell ME you are busy as Hams passing through tell me just WHAT you all ARE doing. Anyway, the busier you are the more notes I should get from you. Hi!

Remember- Jim Corbin 2YC. 78 Maloney St. Eastlakes (Mascot) Ph.MU1022

EMERGENCY COMMUNICATION NETWORK.

The 7th of January saw the Network back in action after the Xmas New Year break and all Operators expressed pleasure at being back on the air. One very pleasing aspect was the manner in which all stations functioned from the word go. The only installation that had any trouble was Control!

At the January meeting of the Division the method to be adopted for the allocation of the ECN Trophy was discussed and it was unanimously decided that the station gaining the highest number of points over the six months would be the winner of the Cup. The Committee were also given the power to make any Consolation awards they thought necessary at the conclusion of the Exercise.

The first Exercise for 1944 has just concluded and resulted in a win for VL2JJ. This station was the acme of consistency as shown by the points scored over the four weeks viz; - 48, 49, 49, 50. This is how they finished:-

VL2JJ ... 196	VL2JE ... 195	VL2JK ... 192
VL2JL ... 194	VL2JF ... 193	VL2JP ... 187
VL2JC ... 194		

Just nine points separated the highest and lowest scorers. Pretty going and it proves that every operator has to be on the qui-vive each week-end and cannot afford to make the slightest error.

Here are the aggregate scores for four months:-

VL2JC	178	195	145	194	712	Total
VL2JJ	188	185	140	196	709	
VL2JP	180	187	140	187	694	
VL2JK	172	183	146	192	693	
VL2JL	149	195	147	194	685	
VL2JF	165	182	121	193	661	
VL2JE	82	153	88	193	516	
VL2JG	184	186	136	-	506	
VL2JN	48	0	140	0	188	
VL2JM	-	-	143	-	143	

Look out for VL2JJ next month VL2JC!

In recent weeks NES has reviewed the activities of the Network and it has been decided to close down VL2JG, VL2JM and VL2JN, as no place could be found for these stations in the re-organisation of that Department's activities. The Operators at these locations have been transferred to other stations and has enabled certain stations to build up their staff of operators. Thus quite a few new voices should be heard soon, particularly from Control.

VL2JC .. It is understood that 2DI is making a study of transport regulations as applied to bus tickets and that when any petrol coupons are about Eric is never backward in coming forward.

Who wouldn't be?

VL2JE .. Stayed on frequency all the time and as a result put their best score to date. I think you chaps must be imbued with the

Robert Bruce spirit. Try, try, try again. Well done chaps. By the way Jack, when DO I get that genny?

VL2JF .. Well, well, well, after all these years 2HP has a baby daughter in the family, but it took son Geoff to do it. I suppose you and Alec will have a lot to talk about now. Was that the reason for the best score to date.

VL2JJ .. It is understood that their theme song from now on will be "Concord, here I come." Nothing's a trouble to these boys and they deserve to do well.

VL2JK .. Ken, Stan and Charlie doing an excellent job and are three good Hams in the making. Quality would appear to be costing them a few points each week-end. Better get Ern on the Job when he comes back, Ken.

VL2JL .. Well it won't be long now. George's daughter Marie is in the WAAFS with the rating of Radio Mechanic and it is understood that she is going to give Dad a few pointers. Poor old George will just have to listen.

VL2JP .. Where was Ron when the light went out? 2JP's signal strength has fallen off over recent weeks and thus cost them quite a few points. A new mike battery should make some difference.

....000....

VICTORIAN DIVISION

Once again we remind all Victorian Hams, members and non-members alike, the meeting at which post war reconstruction of Ham radio will be freely discussed, will be held at the Rooms 191 Queen St., Melbourne on Tuesday 7th March. This Division extends an open invitation to anyone interested in Ham Radio to attend this meeting. Members are asked to bring along any Hams they know who are non-members as this question of Post war Ham Radio is going to be a big thing, and it will be necessary for all Hams to get together so that they may be able to produce a watertight case to justify their future existence. Hams on service and those in the country not able to attend this meeting can do their little bit by writing to the Divisional Secretary and telling him of their ideas...You know every little helps.

We were very pleased to see VK2AGS at a recent meeting of this Division, and the tale of his experiences proved of much interest to the gathering.

Captain J. Winton 3XR, and George Thompson 3TH were also visitors at a recent meeting.

Membership of this Division continues to increase, and members could help considerably by introducing new members. Members and non-members could also help Council very much by keeping Council posted of the rank etc. of any Ham they know to be in the Services. This applies particularly to those on service. These records are desired for statistical purposes, as it is the intention of council to compile an official record which can only be done with the help and co-operation of members.

Council still has a number of Admiralty Handbooks for Sale, they are the latest two volume edition. The price is 18/ 6 per set plus 1/6 postage. Inquiries may be addressed to the Secretary.

And now we have a story to tell .. A Policeman in Queen Street was amazed recently to see two people doing what appeared to be an Indian War Dance in the middle of the street. However he did not take any action which relieved 3JO and 3WQ from appearing in court. The explanation is simple .. some members were returning home from the meeting and were held up at Collins St., by the traffic lights for some considerable time. 3WQ and 3JO jumped out of the car and dashed back to the pad in the centre of the road, and jumped up and down on it in an endeavour to change the lights.... When the lights did change was there a wild scamper to get back into the car before they changed to red again.

.....000.....

(Continued from page 4)

which are situated in about 30 degrees North and south latitude. As the cycle progresses these belts draw together and towards the end of the cycle, situated in about 8 degrees North and South latitude. But sometime before the sunspots finally cease to appear in these regions, a fresh phase of activity gives rise to sunspots which appear in the high latitudes again, and then a new cycle commences. At this time then there are four belts in which sunspots occur, two in the high and two in the low latitudes on either side of the solar equator. The appearance of a sunspot in a high latitude is, therefore, a sign that the current cycle is coming to an end.

It is not a necessary implication, however, that as soon as the minimum is passed, there will be a big increase in the working frequencies for short-wave transmission. Although this apparently does occur sometimes, an examination of former sunspot cycles shows that more often than not, there is during the first year after the minimum period, very little increase in the solar activity. It is during the second year of the new cycle that the big increases most often occur.

There is one other interesting change in sunspot phenomena which takes place at the end of a cycle. The sunspots most often appear in pairs, the one which lies in the forward position with regard to the direction of the suns rotation being known as the 'leader' spot and the other as the 'follower.' These have opposite magnetic polarity, and during any one cycle, one is of North magnetic polarity and the other of South. At the end of a cycle this polarity is reversed. In the case of the group recently observed the leader spot was so little in advance of the follower that it was hard to say whether it had a different polarity to the leader spots of the present cycle or not

.....000.....

THE WIRELESS INSTITUTE OF AUSTRALIA



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Official Organ : "AMATEUR RADIO"—Published by the Victorian Division.

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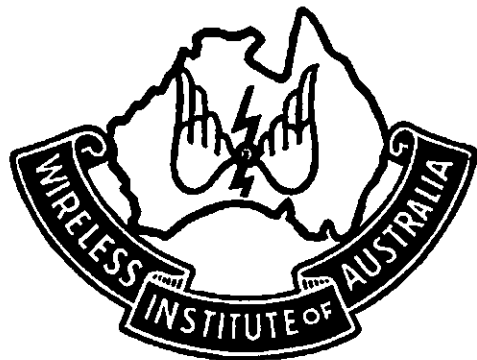
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SIXPENCE

MARCH 1944

AMATEUR RADIO

THE
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WIRELESS INSTITUTE
OF
AUSTRALIA



Published by the Victorian Division

AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

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AN INTRODUCTION TO SIGNAL TRACING.

.. PART II ..

. By Frank Cross VK2FX .

It would be useless to give a constructional article on how to build a Signal Tracer, complete with a list of parts and a point to point description of the wiring because parts are so hard to obtain that duplication of my own tracer would be practically impossible. Anyway what true Ham follows a constructional article? He usually uses gear which he has on hand and redesigns to suit his own ideas, so all that will be attempted in this article will be the requirements of the Signal Tracer, and a few tips so that you may avoid some of the woe that has been mine.

A Signal Tracer is a tuned vacuum tube volt meter. It can be of the T.R.F. or Superhet variety and is no more difficult to build than a T.R.F. or Superhet receiver. As it is a tuned VTVM it is essential that it cover the frequencies that you desire to measure and listen to, so if you are interested in servicing BCL receivers your tracer should cover all the frequencies the receivers cover including the S.W. range, say from 13 to 50 Mc., and the I.F. ranges (175 and 465 Kc.) to be of maximum benefit. It is not necessary of course to cover all these frequencies to make a very useful instrument, for by only covering the BC band and up to 400 Kcs, you can use it on about 90% of the BC supers and if you do strike a DW sat and you know the BC range is working correctly you are well on the way to locating the trouble.

Figure 1. shows a circuit suitable for a Signal Tracer of the T.R.F. variety. Coil switching or plug in coils can be used, but I will leave that to you. In my case, as no suitable coil switch was available "H" type coils, condenser and dial were used for the BC band and .00025 mica condensers shunted by trimmers were switched across the gang tuners to enable the 465 Kc. I.F. band to be covered.

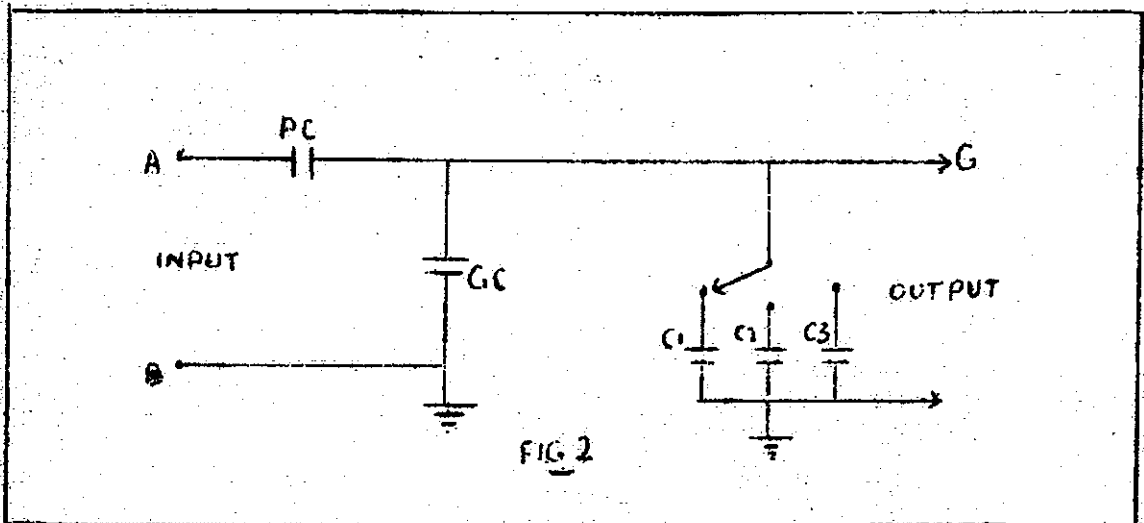
The first tube circuit requires explanation. The probe lead is a piece of low capacity microphone cable, the shield of which is grounded to the tracer chassis to prevent pick up from any part of the first grid circuit other than at the test probe point, which is coupled to the centre lead of the cable through a small capacity in the vicinity of 1.5 mmfd., situated right at the probe end of the cable. This small capacity at the probe point and the capacity of

the cable and entire grid circuit form a signal divider which is independent of frequency. Referring to Fig. 2, say the capacity of the series probe condenser PC is one mmfd. and the entire grid circuit capacity including the cable is equal to 99 mmfd., then if a 100 microvolt signal was placed across the points AB, only one microvolt would appear at point "C", as the capacitive reactance of PC is 99 times greater at any frequency than the capacitive reactance of the grid circuit, Gc.

Were we to use these capacities in our tracer we would get only one hundredth of the signal under test to appear at the grid of the first tube in the tracer. For this reason the two tube stages of amplification between this stage and the detector are recommended, if it is desired to measure the stage gain of the first tube in a receiver.

If a greater capacity is used in series with the probe, a greater signal will appear at the grid of the first tube, but the detuning of the circuit under test will be too great, therefore a series capacity of not greater than 2 mmfd is recommended.

Returning to Fig. 2, let us ascertain the values of condensers C1, C2, and C3. As we wish to use these capacities to reduce the signal in steps of ten, C1, will have to increase the total capacity of the grid circuit, Gc, to 999mmfd. and C2, and C3, to 9999 mmfd and 99999 mmfd, respectively. This will allow us to attenuate the signal in convenient steps. The variable cathode resistor in the first tube circuit is calibrated from 0 to 10, and by rotating this throughout its range, thus varying the amplification of the tube, the signal appearing at the detector will vary as though the attenuator switch were being used. This will provide for the units of attenuation and we will then be able to vary the attenuation of the signal from 100 times to 1,000,000 times in convenient steps.



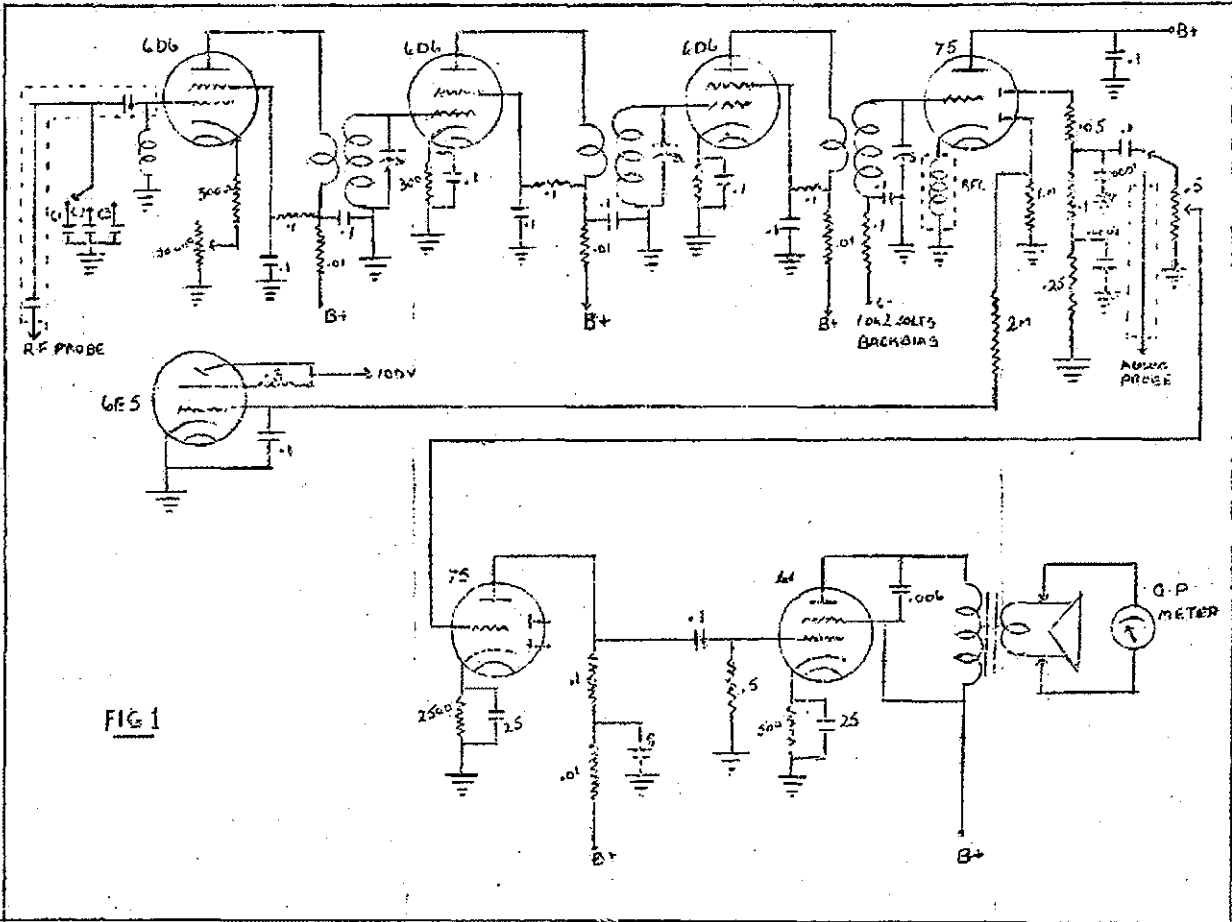


FIG 1

Actually we forget the 100 attenuation in the probe lead, and call it attenuation from 0 to 10,000.

As very few hams, if any, have at their disposal a bridge capable of measuring these capacities, we are forced to use cut and try methods. Even so, a fairly good job can be done and you may be helped by starting where I finished. After trying many combinations, I am using about two inches of twisted hookup wire as the series probe condenser, three feet of 104 microphone cable as the lead and .001, .01 and .1, mfd's. as C1, C2, and C3, respectively. A full rotation of the gain control gives exactly the same variation as either of the first two condensers, but the .1 condenser attenuates the signal too much. It has not been possible to the present time to obtain .1 condensers in various brands, to try, but you may be luckier than I. The marked value on the condensers vary considerably from their real value, and several .01 condensers were tried before striking a scraggy old thing that gave the right attenuation.

This first tube and the attenuator circuit could be fitted to any receiver which has some means of comparing signal strengths, an eye or an output meter, so that opens up possibilities of using your ham super to trace woe in receivers that cover the S.W. bands. Another possibility is to use this attenuator stage to feed into the detector as shown in the circuit complete with the eye indicator, but leaving out the two tuned R.F. stages, to track down trouble in the rig after the bar. Only one tuning coil of the plug in variety so that the ham bands can be covered is all that is needed, as the transmitter will put in enough signal without amplification to work the eye. Probably we find that we can reduce the probe series capacity to reduce detuning of the transmitter circuits under test and still have plenty of soup for the tracer, especially on the final stage of some of the 25 watt rigs.

As the T.R.F. stages are conventional no comments will be made about them, except to say that you can have one or two stages and still have a useful tracer. I have only one stage as the only condenser available was a two gang. If you can get a three gang from an antique dealer by all means use the two stages.

The detector circuit is somewhat unusual. It has been recently developed in the States with the idea of using a high impedance detector of not loading and tuning circuit, thus aiding the selectivity and tracking at the same time, and allowing us to use an eye. The R.F. choke in the cathode circuit should be effective over the frequencies tuned and preferably shielded. Use 100 volts for the target of the electric eye, with a .5 megohm resistor between the target and plate. Under these conditions the eye will close with about 3 volts bias instead of eight. The extra sensitivity and life of the eye will compensate for the reduction of fluorescent glow with the lower voltage.

The audio end needs no explanation, but the greater the sensitivity the better. You can make it to suit your needs. You perhaps could use one stage feeding into a pair of cans, and you could go away with the output meter eye, and just use the audio probe switched to the diode position, as an audio voltmeter. In fact you can make a tracer just as cheap or just as expensive as you like and

(Continued on page 73).

Q OF SHORT WAVE COILS

From an article by Dr. P. C. Michael, G.E. Company, U.S.A.

When a voltage is induced in the coil of a tuned circuit at its resonance frequency, a much greater voltage is developed across the coil and condenser, having to the induced voltage the same ratio as that of the reactance of the coil (or the condenser - both being equal) to the resistance of the coil and condenser. This ratio has been termed Q, and for a tuned circuit:-

$$Q \text{ of tuned circuit} = \frac{1}{Q \text{ coil}} \div \frac{1}{Q \text{ Condenser}}$$

Radio frequency oscillators require coils of high Q for efficiency and frequency stability and tuned amplifiers need them for gain and selectivity. It is therefore desirable to know the optimum size and shape of coils for maximum Q and the degree to which performance falls off with their variations as well as the relative merits of different dielectrics available for support.

In a ny high frequency coil there are two sources of losses having the effect of raising the effective resistance of the coil the Metallic losses and the dielectric Losses.

METALLIC LOSSES

SELF RESISTANCE ... The effective resistance of a conductor at high frequencies is greater than its direct current resistance because alternating magnetic fields cutting the conductor make the current distribution non-uniform.

1. SKIN EFFECT ... In an isolated long, straight cylindrical conductor the high frequency current is concentrated toward the periphery. For frequencies above about 15 Mcs the effective resistance may be shown to be approximately

$$.056 \sqrt{10^{-6} f r}$$

where:- f * cycles / second
r * resistance in ohms / cm
and the magnetic permeability is unity.

If the form factor (length / diameter) and the winding space factor (wire diameter / pitch) are held constant, it can be shown from the skin effect formula, and the usual inductance formula for single layer solenoids, that in the frequency region where skin-effect is prominent and neglecting coiling effect and dielectric loss the ratio inductance / effective resistance (or Q-) is proportional to coil size and independent of the number of turns.

2. COILING EFFECT . When a conductor is in the field of other conductors, the current distribution is still further disturbed, and in a coil the resistance is raised above the skin-effect value by an amount depending upon the number, proximity and direction of the other conductors. It is found that coiling effect at high frequencies is mainly dependent upon space factor.

$$\text{Coiling effect} = \left[1 + A \left(\frac{d}{p} \right)^2 \right]$$

d = wire diameter
p = winding pitch

and A is a function of coil shape and number of turns. A value of 2 may be used for short wave coils. From the two formulae above, it is found that optimum wire diameter for short wave coils is approximately 0.7 times the pitch. When it is not possible to work to this figure a less serious error is introduced by using wire too large, than if the wire be too small in diameter.

3. LEADS . The circuit leads including the metallic path of the current in the condenser also add resistance due to skin effect, but coiling effect is not important except in the extreme UHF region.

4. CAPACITY OF COIL . . . When the frequency approaches the natural resonance value of the coil the current varies from turn to turn due to the capacitative current across turns and thus upsets the basic skin-effect and coiling effect relations, but as coils usually have a natural resonance frequency well above the operating frequencies this may be neglected.

Metallic Losses are caused by heat dissipated in shields etc. by induced currents. These effects may not be readily calculated and are usually minimised by keeping the coil clear of shields and other metallic objects by a distance of one or two coil diameters. Any parts which cannot be kept away from the coil may be silver or copper plated.

.. METALLIC LOSSES . . .

IN THE COIL . . . the insulating supports for the coil cause losses because they are a dielectric forming part of the distributed capacity of the coil. This effect is minimised by using only low power factor dielectrics in the field of the coil, and as little of them as practicable.

IN THE CONDENSER . . . At broadcast frequencies the losses in the condenser are negligible, but at high frequencies this does not hold and the condenser losses frequently become greater than those in the coil. Condenser losses may be minimised in the same manner as set out above for dielectric losses in the coil.

RADIATION RESISTANCE. Negligible at low and high frequencies, losses due to radiation from the coil become serious only at extreme ultra-high frequencies.

CONCLUSION... The following conclusions were reached from measurements of Q taken on various coils at frequencies between 15 and 30 mc/s.

At frequencies above 15 Mc/s the Q of a tuned circuit is dependent as much on the condenser as on the coil.

Coil Q appears to be nearly proportional to coil diameter, but with conventional tuning condensers increasing the coil diameter from one inch indefinitely would improve the circuit Q by less than 2 to 1.

Optimum coil shape factor is of the order of 1.

Optimum wire diameter is of the order of 0.7 times the winding pitch, but a reduction to 0.5 results in a decrease in Q of only about 5 per cent.

Polystyrene and acrylate composition grooved forms provide compact coils which with a conventional condenser at 20 Mc/s gives a tuned circuit Q of 200, and with phenolic composition grooved forms about 170.

Using a conventional type of high-frequency condenser (with ceramic insulation) and coils supported on grooved forms of low-loss material an overall circuit Q of 350 is practicable at 15 to 30 Mc/s with coils of one inch diameter and length.

(Continued from page 4)

there can be just as much variation in tracers as there is in Ham receivers or transmitters.

Don't try to use shielded hook up wire as the RF probe lead, as the capacity is too high. You may get away with hook up wire in some large tubing covered with shielding similar to that used in cars for the aerial lead-in, if no mike cable is obtainable.

Don't use an ordinary diode detector if your tracer is of the T.R.F. variety unless you want it to be as broad as a barn door.

Don't neglect to have a go at making a tracer. The time you spend in building one up will be repaid, when you want to get your junk pile on the air in a hurry.

.....

In these days of conservation and preservation, it might interest those meticulous amateurs and others who trim up odd soldering jobs with a small-cut file, and who find that the file fills with solder. The solder can easily be removed by soaking the file in lead solvent such as used by riflemen. After using the solvent the file should be brushed briskly with a stiff bristled brush.

QST.

.....

TECHNICAL LIBRARY

A page of book reviews conducted for the benefit of
Kams in the Services, and others similarly situated

...

SHORT WAVE WIRELESS COMMUNICATION (including U.W.F.)

This is a book which while technically excellent in many respects, is open to criticism for its sketchy treatment of some of the subject matter and for its haphazard make-up.

Commencing with an historical introduction, which incidentally pays a tribute to the Kams for their early Short Wave work (and ignores their more recent U.W.F. work) it then turns to Modulation and High Frequency Waves, Propagation, High Frequency Feeders, Aerials and Aerial Arrays. Then follows Push-Pull, Power Amplifiers, Oscillators and Constant Frequency Oscillators, Electron Oscillators, Modulation Circuits, Problems of Reception and commercial Receivers (consisting of a description of a Marconi Co supermetrodyne, a very conventional one at that).

Finally, Commercial Wireless Telephone Circuits, Commercial Transmitters, and U.W.F. Therapeutic Apparatus are dealt with. Best Chapters are those on aerials, Constant Frequency Oscillators and Modulation Circuits.

This book has obviously been written for engineers dealing exclusively with commercial communication systems, and the co-authors are two such engineers. We think this a pity, however, that such a work should be interspersed with so many free adds for the Marconi Company. While we realise the fine work this organisation has done and have the greatest of admiration for its late founder, we really feel that the Marconi Co is sufficiently well known to survive and continue to grow great without continual mention throughout the pages of what should be a purely technical work.

In conclusion we take the authors to task for their statement that the design of commercial receivers calls for the highest possible sensitivity "because of the reduction of power of commercial transmitters to the barest minimum." We are well aware that regulations require minimum power for the particular purpose, but surely Messrs. Ladner and Stoner have heard of those "V" wheels which for the past 20 years or so have so uselessly cluttered up the ether with high power.

However, if you want a book which, whatever its shortcomings in a non-technical sense, is technically very sound, and is written with special application to Short Wave work, this is it.

Short Wave Wireless Communication, by Ladner and Stoner 4th Edn.
(1942) ... 573 pages ... 57/-

Our copy by courtesy McGills Newsagency.

Alec H. Glyne - Review Editor.

SLOUGH HATS and FORAGE CAPS.

As our Yank Cousins say...What do you know???...well, you are pretty slow on those notes, I know, just to give you all a nice "new" piece of news to start the month off with.

Incidentally, these "wings", sez some crude lads...these "moans" says those, who remember a few faroff lessons in politeness to old ago...or these "pleas" as gentlemen and others have it...they must be pretty touching, no doubt due to the early hour in the morning at which they are born, for October's effort touched a guilty conscience way off in London, "G". So Maurice Lusby, one VK2WN who is mixed up with Scientific affairs one way and another, used the Air Mail and the modern Airgraph and just missed the February issue.

(M. case no 6041300)
2WN has been away from Aussie for nearly two years spending a good deal of it in America and now in England. Sqd. Leader VK2OR Maurie Brown is also working with him at the moment while a third VK2 Ian Cuffe 2XC a Lieut in the RNVR is a pretty constant visitor at their flat. 2XC is one of those rare birds...a Ham with a Commission in the Navy, and should have some good stories to tell the VK2 Division after the War, not to mention what the two Morrisies will be able to let some light in on. Hi! The last paragraph of 2WN's letter I will quote "Just moved into a new flat, but not sure its a good idea. I had eight Steel-concrete stories above me at the last place...only one above me here. Didn't occur to me till we had a raid the other night"...so I wonder what Maurie's been thinking since the second "blitz" got a go on??? Hi!

Qra for "Snow" Campbell, VK3MR, (as if we all don't know his call, sez the mob...) Campbell M.R. Sgt. 9190 RAAF. Kriegsgefangenennummer 29604...Stalag Luft III...(ViiiB)...Germany. It's in Poland so G2YL says, who kindly sent the news per Airgraph. So when you get a spare moment, remember a card to Snow will be more appreciated than the best bit of DX he ever raised in the "good old days". The "D's" seem to give the mailman a better chance than the little yellow men do. But they will no doubt commence to be "Hon.," men very soon now, by the looks of things. Hi!

VK30F just about finished his 26 days leave down at Hampton, and not a blade of grass cut on the lawn yet, so I hear. Wilf 2ALF now wandering around up North on another cruiser, keeping the Admiral company, but hopes to join 30F again soon.

Captain Don. B. Knock is still down in Vic and is just about a VK3 he has been there so long. At the Staff Corps Mess there is usually a gathering of hams representing almost all the States and the topic sooner or later is always what they are going to "do after the War." Have you decided how to run a Federal Institute yet, oms? And, Don, just say, "Notes" to Johnny Treill for me...thanks over so much.

Charlie Miller, I mean Sgt. Miller once VK2ADE is now at Amberley after a couple of quick shifts around. As Charlie was originally a VK4 no doubt this posting suits him pretty well. What a pity those ZL's got away on us Charlie (2YC).

VK4RF is swotting Trig. Algebra and various other things besides revising about what makes the kilocycles go down at Flinders. His instructor is Ken Bracken VK2FF (how are you Ken... vy long time no see... 2YC) and carved on Govt. property in the school are the following calls... VK2CT, 2BK, 2ADI, 2AHX, 6IG, 7JT and 4RF. The last is no doubt the result of bad example. Hi!

Corporal Jim Stevens VK3ZK has been spending a spot of leave in his home town, Swan Hill. Spends his working hours helping to keep the "Cats" in the air somewhere up North. Has had those two stripes for some time now--perhaps there is another in the offing.

Sgt. H. D. Ackling NX 26238 of the Aust. Spec. Wireless Group once well known as VK2FX arises out of his "grandfatherly" sleep and after a few years announces he is up Brisbane way. Harold, om, such shocks are not good for me, in my old age. I say where is that Commission they said was "just round the corner" in the circular they sent us all... did you say it was 3 years and 8 months ago. Verily, one has to be very careful of advertising. Hi!

Leading Telegraphist Ken Allen RANR (hope I have those all important initials right) has at last managed to get a few weeks home leave and turned up at the Victorian Division where he entertained the rest of the boys with the story of some of his doings over the past few years, including the "true" story of those famous meters!!

Another ham to turn up at the January meeting of the VK3 Division was Capt. Jack Winton VK3XR of an AIF Artillery unit. At that time he was on leave from way up "Darwin way." Jack spent some time in the Middle East and although his job is not a radio one, we believe, he was able to turn on a demonstration of considerable value to the Sigs section.

VK3FR Sgt. Fred Smith also turned up at the VK3 January meeting. It was his first home leave after eighteen months in the West where he spent most of his time training prospective signallers. He has now been transferred to a Sig. Training School at Bonogilla... maybe he is now training AWAS.

VK3BG. Sgt. Roth Jones RAAF is now spending his time up in the Gulf country.

VK3MJ Sub Lt. D.J. Medley RANR is stationed in Sydney and from what he had to say at the Feb meeting of the Vic Division, he manages to see quite a bit of the Harbour.... Don't forget the VK2 Division meetings on the third Thursday, om.... 2YC.

Pilot Officer Gordon Templeton VK3OW is another of the original RAAF Reserve boys who has been on the job since September 1939.

(Continued on page 14)

D I V I S I O N A L N O T E S .

NEW SOUTH WALES DIVISION

The 34th Annual General Meeting of the Division was held at Y.M.C.A. Buildings on Thursday 17th February and the attendance was representative of all sections of the amateur community.

The Annual Report was unanimously adopted and Council was congratulated upon their work over the past year. Some considerable discussion took place regarding the suggestion of an Australian W.I.A. with a permanent staff similar to the R.S.G.B. and A.R.R.L. Members were of the opinion that immediate consideration should be given to this matter and that Federal Headquarters should obtain an expression of opinion from all States.

A rather interesting letter from H. J. Taylor VK2TC regarding the possibilities of using Radio in connection with Bush Fire Brigades was the subject of no little comment particularly as Members were informed that the matter had been taken up with N.E.S. and that body was interested. It is hoped that further information will be available in time for the next General Meeting. Every effort is being made to interest the powers that be and if the scheme comes into operation it will present country members of the E.C.N. with their long awaited opportunity. 2DG please note!

During the past few weeks quite a few members have queried the possibilities of holding some form of contest that would embrace the building of equipment other than transmitting apparatus that would be of value in the post war Amateur Station. Several suggestions were put forward as to the form this Contest would take and it was decided that the Contest would be held and that details would be finalised at the next meeting. One suggestion that will be adopted was that a prize be given for an essay on "Post War Amateur Radio."

During the evening the poll was declared for the election of Council for 1944 and was as follows:-

W. G. Ryan	VK2TI	63	G. Cole	VK2DI	28
C. Fryar	VK2NP	57	R. Miller		28
R. Priddle	VK2RA	56	J. Keane	VK2JN	27
H. Peterson	VK2HP	54	C. Higgins	VK2LO	17
F. P. Dickson	VK2AFB	52	H. G. Wilson	VK2AGO	12
E. Hodgkins	VK2EH	45			

Seven Councillors were to be elected and from the above it will be seen that Messrs. Cole and Miller tied for seventh place and it was decided to place both names in a hat and a draw be made with the result that G. Cole, VK2DI gained seventh place.

The various Office Bearers will be elected by Council at its first Meeting after the Annual General Meeting.

At the conclusion of General Business a general discussion took place dealing with "The Feeding and Rotation of Three Element Beams" and one of our new Members, Mr. Ken Davidson dealt at some length on the mechanical aspect of the subject.

The next General Meeting of the Division will be held at Y.M.C.A. Buildings on Thursday 16th March and the main item on the Agenda will be the proposed Contest. If you have any ideas, come along and put them before the Meeting.

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EMERGENCY COMMUNICATION NETWORK

The Competition for the E.C.N. Cup (Second Series) is now rapidly nearing completion. The degree of efficiency attained by each station is very heartening to the organisers and from this angle alone the contest has justified its inception. There is so little difference these days between any station that the Committee are forced to pick on the slightest error as an excuse to deduct points. The exercise just concluded resulted as follows:-

VL2JJ, VL2JE each 198. VL2JC 197. VL2JL, VL2JK each 195, VL2JP 194 and VL2JF 193. It is very pleasing to see VL2JE sharing the honors this month. This station presented quite a few difficulties until the last few months both from a technical and an administrative angle but these hurdles have now been overcome. VL2JL would also have shared the lead this month but for - VK2AJW please note - the "kindergarten" type of messages transmitted over two week-ends and a desire to enter into acrimonious discussion over the air.

Here are the aggregate points to date:-

VL2JC	909	VL2JL	880
VL2JJ	907	VL2JF	854
VL2JK	888	VL2JE	714
VL2JP	888		

March should see a very interesting tussle between VL2JC and VL2JJ. I wouldn't try and pick the ultimate winner!

As pointed out in previous issues N.E.S. intend to make greater use of the E.C.N. in the very near future. In the past Radio Practices have not been co-ordinated with those of other Sections of the N.E.S. All this will be altered. It is anticipated that Radio Stations will, in future, practice on the same

nights as the District Controls to which they are attached.

This will mean that stations will practice as follows:-

Tuesday Night.

VL2JD
VL2JK
VL2JP

Thursday.

VL2JL
VL2JE
VL2JF

During that week in which the third Thursday falls, all stations will practice on the Tuesday night. It is not known yet when this scheme will come into operation. Although there are only 5 D.A.C.'s there are no less than 69 municipalities and all these practice nights have to be co-ordinated.

All Operators will join in extending sympathy to both Messrs. Arthur Springett VK2OM and George Shelley VK2QF who both suffered bereavements in recent weeks through the loss of their mothers.

.....

POST WAR AMATEUR RADIO.

What are your views regarding this all important subject? Do you think that Amateurs should be granted the same privileges as in pre-war days? Do you think they should be restricted to operating on the higher frequencies? Should power be limited to 50 watts or a kilowatt or is there a happy medium. Do you think the Institute should have a permanent staff. Do you think all Amateurs should belong to the W.I.A. What are your ideas of the post war Amateur Station? Do you think that Service and Civilian Defence Reserves should be organised and maintained by means of a Government subsidy. Do you think that the P.M.G. should vest in the W.I.A. the control of Experimental Radio to a larger degree than they did in the past.

In an endeavor to find the answers to the above questions and of course many others dealing with Post War Amateur Radio, the New South Wales Division of the Institute has decided to offer three One Pound War Savings Certificates as Prizes for the best essays received on this subject. Essays will not be restricted as to length, but if possible should be typed. The Competition is open to all Amateurs in Australia. The definition of an Amateur is a person who is interested in Experimental Radio. In order to give Servicemen an opportunity of forwarding entries the Competition will close on 18th May 1944 whilst all other entries should be sent in not later than 20th April 1944. Entries should be addressed to Federal Secretary, W.I.A., 21 Tunstall Avenue, Kingsford N.S.W. and endorsed "Essay Competition".

The winning Essays will be published in "Amateur Radio." The judges, whose decisions are to be regarded as final, reserve the right to increase or decrease the number of prizes dependent upon the number or merit of the essays received. Remember the Contest will close on 20th April 1944 for all Amateurs other than Servicemen and 18th May for Amateurs on Service.

x x x

VICTORIAN DIVISION

Since Christmas the Victorian Divisional Council has been very busy in exploring the possibilities of establishing a Radio Communications Net to act in conjunction with the Fire fighting authorities.

On New Year's Eve following a report in the daily press that there was lack of manpower and communications, Council contacted the Forests Commission offering the services of operators and where possible equipment. This was per telephone, two days later a letter was forwarded confirming the 'phone offer.

Following the disastrous fires in the Western District, Council received a telegram signed by various Western District hams. The main text of the telegram read:- "Meeting of Western District Bush Fires Association unanimously adopted suggestion Amateurs co-operate radio communications fight bush fires. Request Institute assistance." Immediately two representatives of the Victorian Division contacted responsible State authorities and received every encouragement, which resulted in the attendance of representatives at a meeting of one of the fire fighting bodies, where the scheme was explained in detail by the aid of maps.

This body were very enthusiastic in the scheme, and it was gathered that they were working on a big re-organisation scheme into which the radio network would prove of utmost value.

To date nothing further has been heard by Council. This of course was anticipated, and Council is very hopeful that the authorities will see the value of the service that the Institute can offer.

Members interested in the re-formation of the Western Zone are asked to contact George (Tim) Wells...VK3TW...Hamilton.

.....

Enlisting as ACI, Gordon spent four years in Melbourne at RAAF HQ sigs. and later was for a time at Melbourne W/T station. He received his Commission in October '43 after being through all the ranks, and is now serving with GHQ in Brisbane.

And lastly here is the story of the "honest Ham"...apparently such really does exist...but I have yet to meet it. Hi! "it appears he was told by a Q.M. to take some Radio gear out of the said QM's way, and, under the impression that he was meant to take the gear to his unit the honest ham transported the gear and reported same to his C.O. Too late, alas, he discovered the QM meant that our honest ham could have the gear himself" ...wouldn't it?...So be careful, all ye who may be thinking of reforming.

Lastly the QRA is 78 Maloney Street, Eastlakes...the 'phone number is MU1092....and why the heck more notes don't arrive is because you are a lot of lazy so and sos...Hi!

These notes nearly didn't appear this month Ed.)

.....xxx.....

THE WIRELESS INSTITUTE OF AUSTRALIA



Divisions of the Wireless Institute of Australia exist in every State of the Commonwealth. The activities of these Divisions are co-ordinated by Federal Headquarters Division, the location of which is determined from time to time by ballot.

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Vice-President : H. F. PETERSON, VK2HP. Federal Secretary : W. G. RYAN, VK2TI.

Councillors : C. FRYAR, VK2NP ; W. J. McELREA, VK2UV

Official Organ : "AMATEUR RADIO"—Published by the Victorian Division.

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T. D. HOGAN . . VK3HX - UM1732

J. G. MARSLAND VK3NY - WF3958

NEW SOUTH WALES DIVISION

Registered Office :

21 TUNSTALL AV., KINGSFORD

Telephone : FX3305

Postal Address : Box 1734JJ, G.P.O., Sydney

Meeting Place

Y.M.C.A. BUILDINGS, PITT ST., SYDNEY

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The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and on invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

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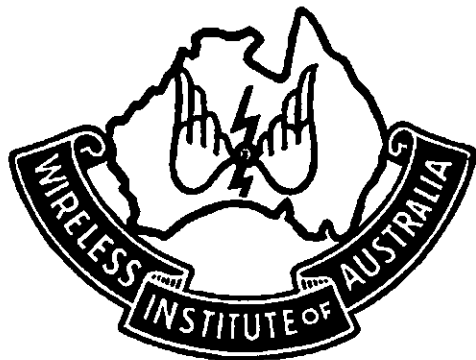
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SIXPENCE

APRIL 1944

AMATEUR RADIO

THE
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OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA



Published by the Victorian Division

AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol 12, No. 4

April 1944.

SOLVING THE RECTIFIER REGULATION PROBLEM.

By G.F. COLE. VK2DI

Many amateurs just go blindly along in their choice of Power supply filter components. However a little time spent in this direction will result in longer rectifier life, fewer blown filter condensers, less heating of the power transformer, and last but not least, almost perfect no load to full load regulation. The discussion to follow will be limited to the common single phase, full wave circuit shown in Fig. 1.

The regulation of a rectifier and filter combination is governed by the following three components.

1. The I X or commutation reactance drop.
2. The I R or d.c. resistance drop.
3. The charging effect of the filter condenser.

The first component can be kept to a very low value by proper transformer design, details of same being outside the scope of this article....

The second can be reduced to a small value by using rectifier tubes, chokes, and power transformer having low d.c. resistance, hence low voltage drop. Mercury vapour rectifiers are almost essential as the internal voltage drop is almost independent of load current variations, and remains at approx. 15 volts during the useful life of the tube. For that reason it is surmised that mercury vapour tubes are to be used...

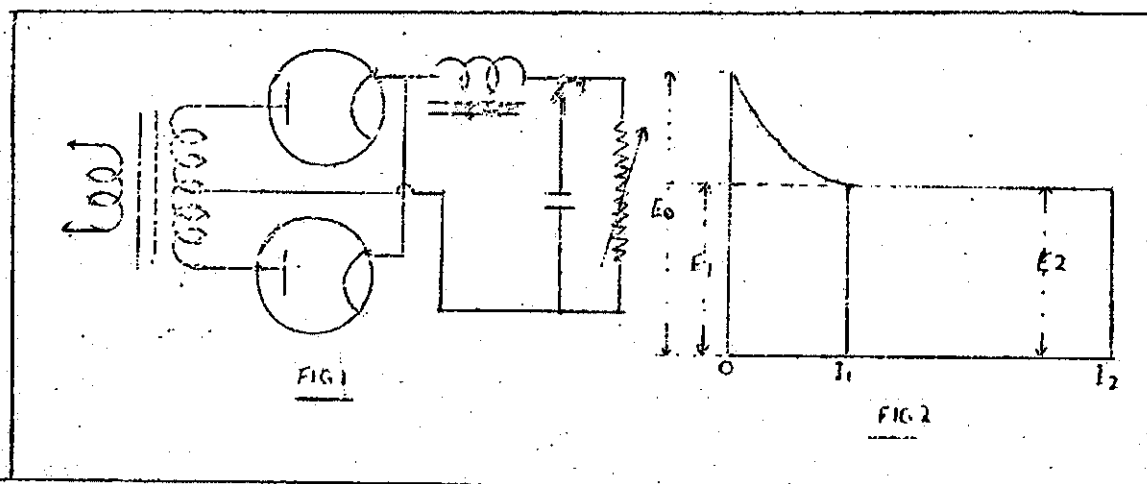
The third, the charging effect of the filter condenser is more difficult. If the rectifier had no filter that would be the end of the matter. The rectifier would deliver the average value of the rectified voltage wave less regulation components 1 and 2. As component 1 is usually small, it can be neglected for most practical purposes.

Then $E_{d.c.}$ equals $(0.9 E_{rms.} \text{ less } 15 \text{ volts rectifier drop})$ where $E_{rms.}$ is the RMS volts per rectifier plate. However, with the filter connected there is the ever present tendency

with small load currents for the condenser to charge up to the peak value of the rectified wave. With no load current, this value is equal to - 1.57 times E d.c. - where E d.c. is the rectifier output voltage.

As the current increases the filter output voltage falls rapidly until the current I_1 is reached. See Fig. 2. For loads greater than I_1 the regulation depends only on the D.c. resistance of the choke and transformer voltage drop. Therefore for good regulation the minimum load current should at least be equal to I_1 . The filter condenser and choke bear an important relation to each other and to the value of the current I_1 .

The main purpose of the filter is to remove the fundamental a.c. component which has a value of 66.7% of the average rectified d.c. output. Since this component is purely a.c. it encounters only a.c. impedances in its circuit. If we designate the choke impedance X_L and the condenser X_C both at the ripple frequency, the impedance to the ripple is X_L minus X_C . From this it can be seen that the greater the inductive reactance (the larger the choke inductance) the smaller the "condenser charging effect" and the better the



regulation. The condenser reactance also effects the regulation but to a less degree than that of the choke. In a well designed filter X_L is high compared to X_C . Also it can be seen that the predominant element in determining the value of the minimum load resistance R_L for good regulation is the choke.

$$\text{Equating } R_L \text{ equals } \frac{X_L - X_C}{0.667} \text{ ohms.}$$

From the above it follows that the lower the choke inductance the lower R_L and the higher the minimum current for the desired regulation. Good engineering practice is to have a bleeder current equal to 10 - 15 % of the full load current.

REPRODUCING RECORDS WITH LARGE RADIUS NEEDLES.

It has been generally accepted that a needle with a tip of as small radius as possible is desirable for optimum reproduction from lateral cut gramophone records. This is based on the theory that the modulations are of equal lateral amplitude throughout the depth of the record groove, and it was therefore considered that a needle fitting tight to the bottom would penetrate the groove farthest and so give the greater high frequency response.

It has recently been claimed that some unexpected benefits can be obtained from the use of a needle point of larger radius which makes contact only with the upper side walls of the record grooves.

Graphical comparisons were made between three sizes of needle tip...0.0023 in; 0.00275 in; and 0.004 in...the bottom radius of the groove being 0.0022 in; the width 0.006 in; and the included angle 88 degrees. It was apparent that the greater area of contact was given by the smaller radius needle tip due to its close fitting in the bottom of the groove.

An enlarged plan view of part of a modulated record groove, with a 0.004 in needle inserted, was also presented. The modulations represented a sine wave of 7000 c/s near the inside of a 78 rpm standard record with a peak-to-peak amplitude of 0.0004 in. It was obvious that the full amplitude could not be traced by a radius tip of such dimensions, and it would seem that an increased amplitude could be obtained by decreasing the needle radius, thus allowing it to drop into the groove.

In a curve showing the effect of tip radii, varying from 0.002 in to 0.006 in., the electrical output for a constant frequency of 5000 c/s with 0.002 in peak-to-peak amplitude, other factors being unchanged, the maximum output was reached with a tip radius around 0.004 in.

This increase of high frequency output results from the fact that HF modulations are not impressed in equal amplitudes throughout the depth of the groove, and are less at the bottom which can be attributed primarily to certain stages in record manufacture. During processing the grooves are distorted by the chromium plating, which deposits a heavier coating on the raised surface (corresponding to the groove bottom), and in pressing, the raised portions become worn and distorted by the squeezing of the "biscuit" of record material across the surface.

Two records pressed from the same stamper were reproduced by the same turntable under identical conditions, except for the needle tip radius. An improved signal-to-noise ratio was obtained with the 0.004 in needle.

Measurements made of the signal-to-noise ratio in the modulated groove show that a large radius needle tip still retains a superior signal-to-noise ratio at 500 play backs. Other curves reveal that there is an appreciable reduction in surface noise at 7000 c/s with the wider needle, and that the tracking at 94 c/s is more accurate.

If the results are confirmed by further work being carried out, it would seem that the explanation for tolerable quality record reproduction with fibre and other non-metallic needles, lies in the fact that the tips must of necessity broaden rapidly.

(Taken from an article in 'Wireless World')

.....oOo.....

(Continued from page 2)

The selection of the value of the input choke is important in keeping the rectifier peak current within the tube rating. The inductance is given by the equation -

$$L \text{ min. equals } \frac{R.L.}{1000} \text{ Hy.}$$

The above formula gives the minimum inductance, the optimum value being 2 times L min.

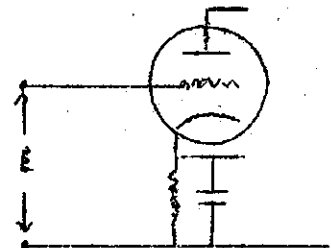
However for "Ham" purposes it is more economical to use the minimum inductance and to use a larger bleeder current, than to purchase a larger inductance. The alternative is a swinging choke, the design of which is difficult, or a "tuned choke filter" of which I will not attempt to write at present.

In two section filters the second section has nothing to do with the regulation, except for the DC resistance of the choke which causes some voltage drop.

.....oOo.....

A CORRECTION

In the January issue of the article Vacuum Tube Voltmeters the diagram in Fig 7 was partly incorrect. The correct input circuit is shown here.



.. FOR SALE ..

PALEC VGT...multimeter...valve tester...complete with new 6X5 rectifier and meter movement recently fitted.
Inquire....B. M. Plowman, VK3QC....High Street....Terang....Vic.

U.S. ARMY SETS.

Few facts have been published about the sets used by the U. S. Army, but here are some of the details about some of the pack sets-- or "walkie-talkies" as they are called---at present in use.

One of the most interesting of the transceivers used is type 511. This set is now being extensively used by the infantry for communications between company and battalion. The circuit of this set, which is fixed tuned on six frequencies is not available, but some of the salient features in design may be given.

"Miniature" technique is employed in the design of this nine tube set, which is housed in a metal case measuring approximately 6 x 6 x 8 inches, mounted on a heavy 3 foot 6 inch spike which is used for inserting in the ground. Access to valves etc. is gained by sliding the base plate down the spike. This reveals a second plate which, when withdrawn, comes away with the screening cans of all the valves. Incidentally, rubber cushioning is provided in each valve screen.

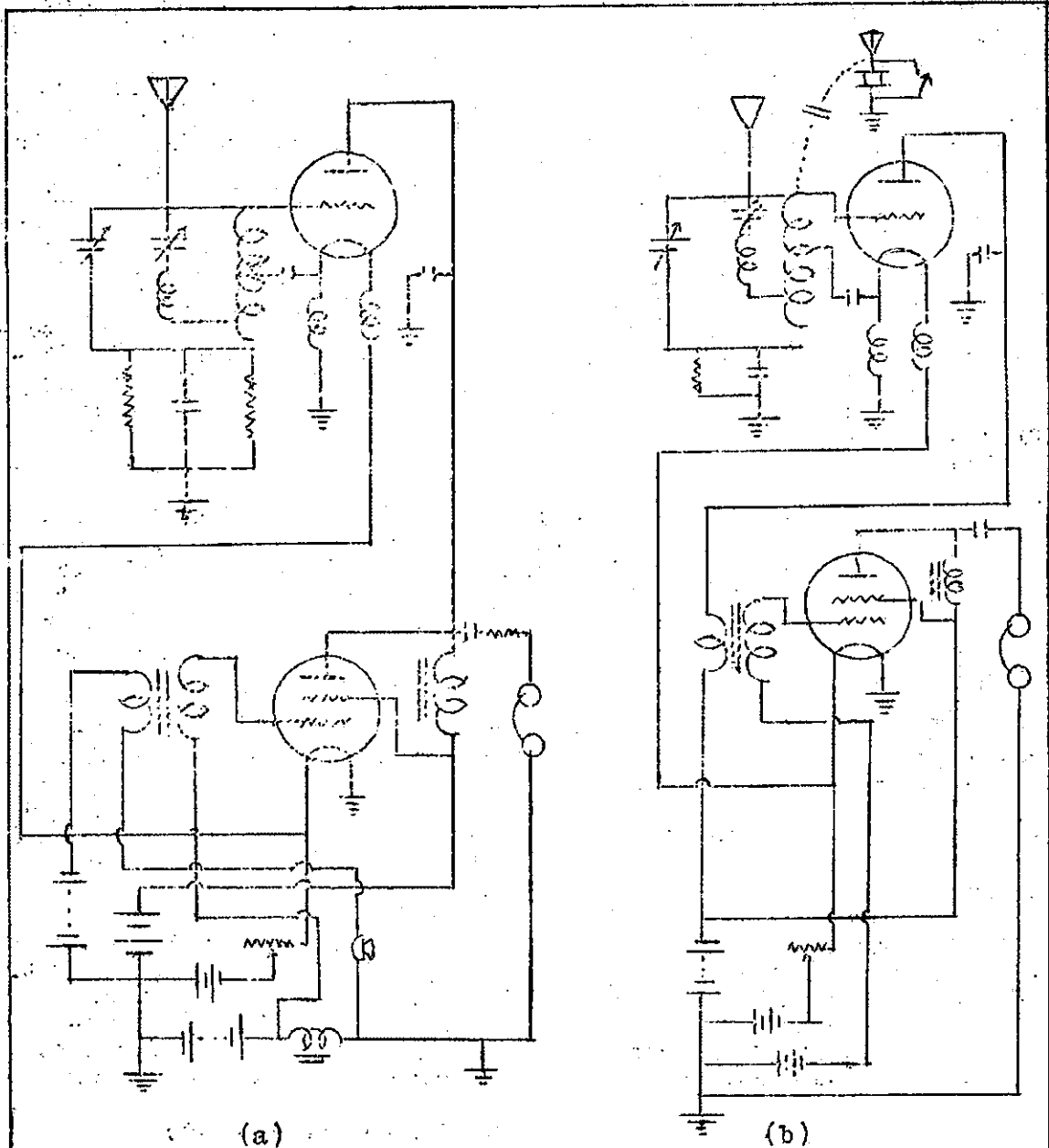
The joints of the case are rubber faced to render them waterproof under most conditions; it can be passed through water without damage, but would be damaged if left submerged. The set is switched on by extending the 6 ft. telescopic aerial which is fitted to the top of the case. The send-receive switch is fitted on the case near the base of the antenna.

A case measuring about 10 x 9 x 2 inches is carried on the operators chest and contains the combined HT/LT battery, spare coil and combined microphone-loudspeaker. The power supply is connected to the set through a multiple cable and a nine point plug. Total weight of the set is 16 lbs. and it is stated that it has been used with considerable success in North Africa and at Guadalcanal.

Another set which is in use has been styled the "handie-talkie." This transceiver used for communication between platoon and company is about 14 in. long. It is used like the hand-piece of a modern desk telephone. Miniature technique is also employed in the construction of this 7 tube set, which weighs approximately 5 lb. Very few details are available however, regarding the circuit.

The original "walkie-talkie" pack set is a two valve combined transmitter receiver of considerably large size and weight. The complete outfit, including batteries carried in a can as haversack weighs approximately 27 lbs. When used as a transmitter one valve functions as the oscillator in a modified type of crystal controlled hartley circuit; the anode being

(Continued on page 14)



Circuits taken from U.S. Army instructional manual showing basic circuits of the original "walkie-talkie" when functioning (a) as a transmitter and (b) as a receiver.

TECHNICAL LIBRARY

U.E.F. TECHNIQUES... Brainerd, Hoehler, Reich and Woodruff
Massachusetts Inst. Technology. 1942
570 pages.....38/3.

This book was produced by the above panel of authors to provide a text book of radio theory for senior engineering students in US Universities. The whole work was completed in a remarkably short time, being printed by the offset process (facsimilie of the original typescript) to save time involved in setting up in the usual type form.

Although written chiefly from the UHF angle it is almost entirely applicable to lower frequency work and should be of immense value to radio engineers working in almost any field of the science.

The arrangement is interesting, commencing as it does with an analysis of linear circuits, which is later developed to include circuits having the conventional coil and condenser combination

Following this introduction there is found a thorough treatment of Tubes, Power Supplies, Amplifiers, Trigger Circuits and C.R. Tubes.

Having laid a solid foundation the authors then pass to Modulation, Demodulation, Receivers, Transmitters, UHF Generators Transmission, Radiation and Wave Guides.

The book is terminated with a Bibliography which is by far the most complete we have ever seen in any technical book.

The whole of the text is amply illustrated with diagrams and the authors have contrived to keep mathematical and literal subjects in their proper relation to each other so that a general idea of any chapter may be had by skipping the maths, and returning to them for fuller information later.

We can say without any exaggeration that this is the finest radio book yet to hand, and although shipments so far have been small it is worth waiting for.

HIGH FREQUENCY THERMIONIC TUBES... A.F. Harvey (London).. 1943
235 pages ..30/-

This is a fine specialist volume and can be recommended to anybody wanting sound basic information on the types of tubes used and their behavior at High and more particularly Ultra-High Frequencies.

Beginning with two introductory chapters, dealing with General Properties (with reference to Rectification, Amplification, Negative and Positive Feedback) and Influence of Frequency on Operation, it passes on to a discussion of the main types of High Frequency Generators. In this section are included Gill-Morrell, Backhausen-Kurz, Magnetron and Klystron generators. The Magnetron is given special attention, occupying about half the entire volume.

The book is rounded off with a discussion of wave-guides and horn radiators, followed by a very complete bibliography. Both the illustrations and the text are well arranged.

Oh boy! did you see that polite-little crack over the head with a piece of rubber hose filled with lead shot, ye ole Ed., put at the end of this column last issue???? And poor old ZYC innocent as a new born babe. It is all you correspondents sending in reports late, or not at all that causes the "trouble" ... and that lets me out... and, though the veracity of the statement may or may not be open to serious question, what's the use of a column if you can't "pass the buck" and then declare correspondence on this subject closed Hi!

There is nothing like having ones judgment vindicated for all and sundry to see. Some time ago "I" made a Captain out of a Sargeant, and loud were the heehaws that greeted me at the VK2 Divisional Meeting. Well, laddies read the following from the "Mentioned in Despatches" list in a recent paper ...

"Sgt. A. E. Peppercorn of Bexley, Sydney, served as signals N.C.O. of the wireless telegraphy detachment station at an important base in New Guinea, and was responsible for the installation and maintenance of wireless apparatus. Despite many severe raids, the station functioned continuously."

Now, I ask you, was a mere Captaincy enough!!! But there is one "doubtful" point - those "raids" - were they the mosquito type he mentioned or a new kind of raid of a different variety - hi! Fb, Om anyway, congratulations from "all the Hams."

VK3GB rang up tonight - he is over here in VK2 protem. He sent me a packet of gramophone needles for Sid Clarke up in Milne Bay but alas like other parcels these days they went astray - tough luck Sid, Om. Of course Ed. I said to him - Oh no - you can't come out tonight - the Mag. Committee won't let me - hi!

A letter from P/o Cec Light to Harold Peterson 2HP seems to indicate that Cec certainly has had a good time since he arrived in England. By now Cec should be flying a Lancaster round about the place, possibly sending a few QSL to the D's.

On the back of VK2NYs subscription form he mentions that of the old gang around his area. 2GM is playing around with transmitters for the RAAF in Darwin. 2AFC an ex Grafton Ham is also in the RAAF somewhere while 2CJ & 2NY still stay around the old home town, the former busy with BGL sets and the latter spends all his spare time with the Sigs section of the local VDC.

Bruce O'Brien VK2OH is another of the VK2 gang who disappeared into the blue soon after the war started. Harold Peterson had a note from him which tells us he is in Group 944 RAAF up Townsville way. Bruce had very little to say about his doings so he must be on the Hush Hush sections. Hi. Anyway, Bruce its nice to know just where you are.

The 50F, 2ALF, and their VK6 companion seem to have once more gone to sea, to help the Yanks up North one presumes, so here's wishing them another safe and quick return. How's the admiral well, om?

Lieut. Joe Ackerman seems to have started off on a new tack, where the "beard" is quite the rage. Hi! 2ALG writes that he is now in the 3 Aust Water Tpt Gp. (Small Craft) Sig. Section. And that is quite a change from Alice Springs and Katherine. Hi. Joe says he did a course of Seamanship at Flinders, along with 3DA who is going to 2 Group, while there saw 2FF, 2AFJ and 3YP.

Captain V. L. Cole VK2 ACS is now stationed in Melbourne where he is engaged on the design of Radio Equipment.

Several letters from 3GY to 3NY reveal that he got up to LAC without Jim noticing it. Clem (3GY) has been in the Darwin area for about ten months now and is looking forward, hopefully, to some leave which should come his way in another five months or so. He has had a few trips to the coast and endeavoured to acquire some sun tan but had to be content with a crop of nice blisters.

News comes of L/Cpl Jim Watson 3NQ. Jim is with a Signal Tng Btn at Bonegilla and reports meeting Geoff Pryor 2AMP recently. Although he believes there are several other hams in the vicinity he has not come in contact with them yet. The home shack at Darlington just missed the disastrous fires in the Western District recently, a change in the wind from north west to westerly swinging the fire away when it was within half a mile of the house. Missing Darlington the fire swept to Derrinallum where 76 houses were destroyed. Jim writes that his younger brother Alan has now returned up in England. Receiving his Commission in Australia, Alan passed through the States on his way and while there he looked up W2CC who has kept in touch with 3NQ for ten years or so both by radio and letter. Alan writes he was given a great welcome by W2CC..(from what I have heard W2CC has the real Ham "spirit"--2YC).

LAC W.Gaze who hopes to take out an amateur ticket after the war and who is the prospective ham to be introduced by Vic Smith 3UR writes an interesting letter. He has been on the move quite a bit during the past few months but hopes he is settled for the time being. Most of his moves have been within the Darwin area and he has hopes of some leave soon. He writes "Have plenty of work to do...its one thing being at a place where everything is at hand and quite another thing when most of the things have to be improvised." (This chap has the makings of a Ham, anyhow...Ed.) We have a few boongs around the camp and they are invaluable for climbing trees...the camp is pretty good, "fairly" dry in the rain and we have had some good storms so far...plenty of water since the rains. We also get a bit of fresh fish which the boongs spear. They use a three prong job and when they see a fish about five pounds (hope this isn't another fish yard. Ed) they heave the spear and there's your fish... Price.....One cigarette.

And so until next month...cheerio....all notes to --
78 Maloney St., Eastlakes, MascotPhone MU1092.

.....

D I V I S I O N A L N O T E S .

The Editor regrets the exclusion of the New South Wales Divisional Notes. This is due to the fact that at the time of going to press they had not arrived.

---oOo---

V I C T O R I A N D I V I S I O N

The March meeting of the Victorian Division was one of the largest for some time. The subject set down for discussion was Post War re-construction of Amateur Radio. Very little of this vital subject however was discussed, as the main topic of the evening was of present interest, that of the possibilities of establishing a Radio Communications Net to cover the fighting of Bush Fires.

As mentioned in last months magazine Divisional Council has for some time been negotiating with Authorities who were interested in such a scheme. Unfortunately much of the information received by Council has been confidential and at present we are unable to tell all the information at the disposal of council. The discussion at the meeting finally ended by the moving of a motion expressing members confidence in Council on the manner in which they were handling the matter. At present the matter rests with a request of the authorities for a demonstration of traffic handling. This demonstration will be staged at a District Meeting which will be held in Hamilton about the middle of April.

At the March meeting there was a large attendance of country members, Bruce Mann 3BM, Tim Wells 3TW, Mort Riley 3TN, Bruce Plowman 3PC, J. Anderson 3JA, R. Jonasson 3ND, Neil Templeton 3HG. If I've missed anyone please forgive me....No I've not forgotten Bill Williams 3WE and Keith Scott 3SS, because as they are in the armed services, I more or less count them as regulars.

However this attendance of country members has in some measure been responsible for the re-formation of the country zones. The Western Zone seems to be the most fortunate as there are more members actually living in that zone than in the others. The organisation of that zone is well under weigh under the capable guidance of Tim Wells 3TW and Bruce Plowman 3PC, and those interested should contact these two Hams.

Unfortunately the Eastern Zone has, as far as is known, only three members actually living in the area, but Ron Jardine 3PR is endeavouring to do some thing. The Northern Zone also only has a few members and in this case Bruce Mann 3BM is trying to create some interest. Zone members interested should contact either 3PR or 3BM.

It was fortunate that all these country members were able to be in the city at the same time and attend this particular meeting, as Council welcomes any opportunity of closer co-operation with the country Ham. It is hoped that in the future that this co-operation will be carried out to its fullest extent.

To this end at a subsequent Council meeting, at the request of the Western Zone Mr. T. D. Hogan VK3HX was appointed Council Representative for that Zone.

In preparation of the re-organisation of the magazine Council at its last meeting appointed Mr. J. G. Marsland VK3NY as Manager, Mr. T. D. Hogan VK3HX as Editor, and Mr. R. A. C. Anderson VK3WY as Technical Editor.

In an endeavour to establish a library of technical information and data, Council has decided that the Laboratory Committee in future peruse all Technical Magazines and such like publications so that the information contained therein may be filed and at the same time indexed, so that in the future members may have at their disposal any technical information they may desire. It must be understood, of course, that this will take some time to establish, and the Laboratory Staff would welcome any help offered.

.....xxXXxx.....

REVIVING OLD IDEAS.

A well-known engineer said that, should he have a hand in the development of post war radio-electronic products, he would set a group of men to digging in the dust of the past in search of new ideas.

What he means is that many ideas which have come along before the science of radio was really ready for them are worth reviving in the light of modern technique.

A case in point is the original RCA loop-operated receiver using type 199 tubes. The use of a loop antenna in those days when gain was hard to obtain, was not too successful. Later when gain became cheap and easy to obtain, the loop was resurrected, and to very good advantage.

It is also interesting to observe that a condenser phonograph pickup was developed around 1924 or so. It was designed for use in conjunction with an RF oscillator and some form of

detector and had no particular advantages over other pickups. But there are indications now that the capacity pickup, used in conjunction with a small FM unit, may find widespread use in the post war period.

Speakers are another case in point. Small speakers with rather good efficiency and frequency response can be developed if the cone has sufficient rigidity, and at the same time a rather large excursion. The answer to this problem may well rest in the use of a single turn voice coil. If that is the case it will be found that such a voice coil was first used in a dynamic speaker about 1924.

The future is always indebted to the past in some manner, and it is good engineering practice to constantly revalue old ideas in the light of new developments.

....."Radio."

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(Continued from Page 5)

maintained at RF earth potential. The second valve functions as the amplifier of the Heising modulation system. For reception these valves operate respectively as super-regenerative detector and AF amplifier. The set has a frequency range of from 52.8 to 65.8 Mc/s; there is a separation of 400 Kc/s between the 33 available frequencies. Battery life is sufficient for 20 hours continuous operation; the life is 3 or 4 times as long with intermittent operation.

The set is housed in an aluminium alloy case. Among the accessories is a break-in box, which connects to the battery plug of the set; this provides means for connecting separate batteries to the set if required, and also enables meters to be connected to the various circuits. The controls and components mounted on the front panel of the set, comprise tuning calibration switch, calibration adjuster, filament resistance and switch, filament voltmeter and microphone and headphone sockets.

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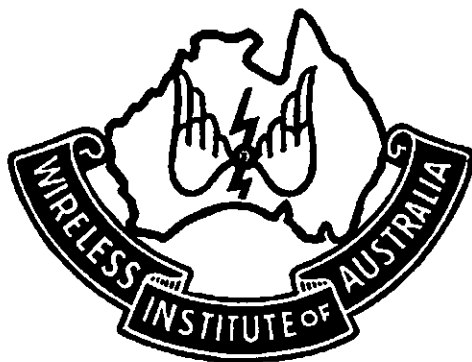
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MAY 1944

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F.M. LOUDSPEAKER DISTORTION

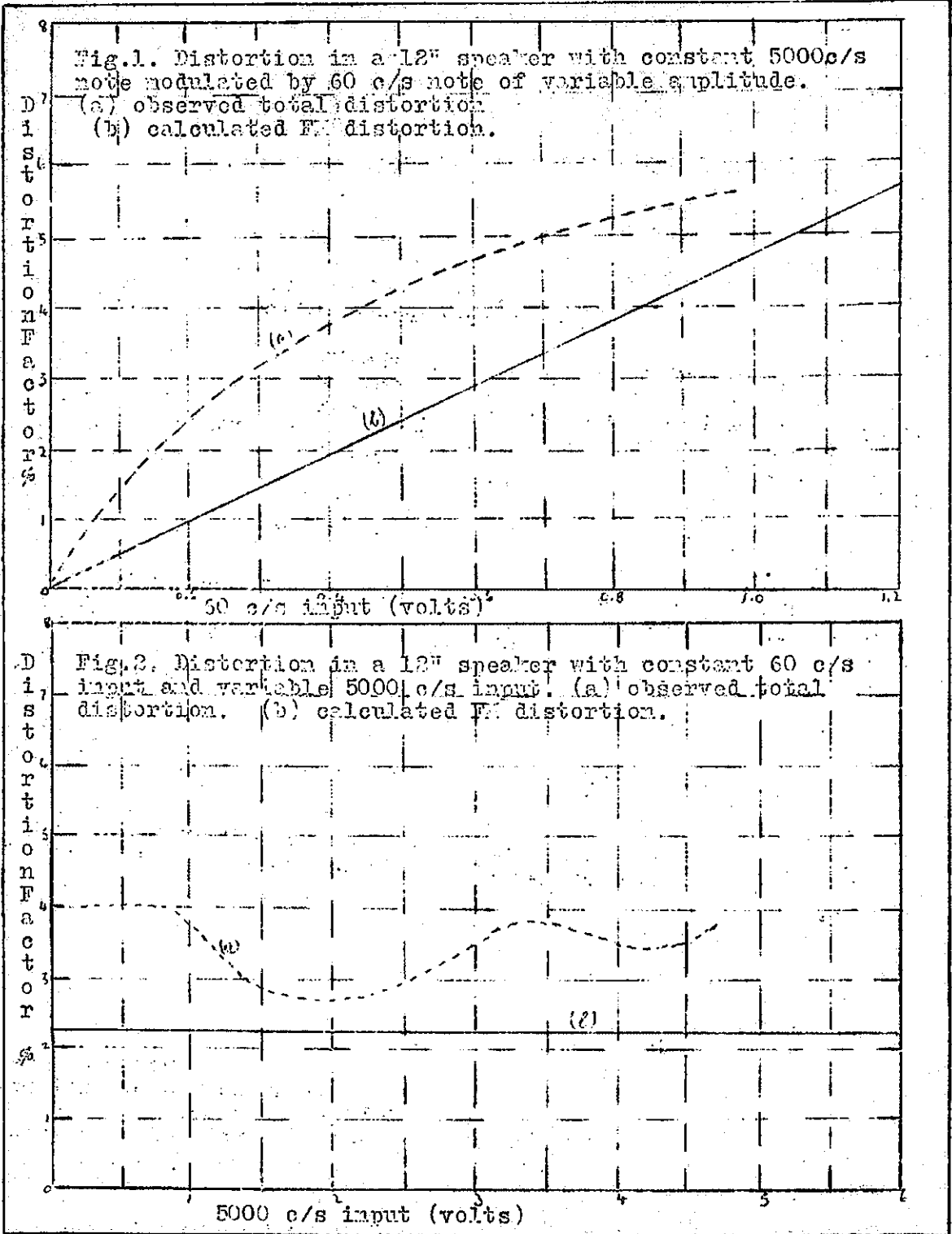
Readers interested in high quality reproduction are no doubt acquainted with the principal sources of frequency amplitude and transient distortion in the loud speakers. They not be aware however, that there is yet another possible source of distortion which may be termed "frequency-modulation distortion," and which arises when a loud speaker is reproducing a note of high frequency at at the same time vibrating with large amplitude at a low frequency.

Cross modulation of high frequencies by a low frequency can occur in speakers with a non-uniform distribution of field in the air-gap, but the distortion which forms the subject of this note is of acoustic origin and would occur even if the speaker had a perfectly linear electro-acoustic response.

The origin of the distortion is the Doppler effect which causes the pitch to rise when the source of sound is advancing towards the listener and vice versa. Imagine a source of sound to be sending out pressure pulses at 100 cycles per second. Taking 1,100 feet per second as the velocity of sound in air, one pulse will have travelled approximately 11 feet towards the listener before the following pulse starts. Suppose now that the source of sound is moving towards the listener at say 150 feet per second.

In the 1/100th second between pulses the source will have moved up 1.5 feet so that the distance separating the first and second air waves will now only be 9.7 feet. This is equivalent to an increase in frequency from 100 to 113 cycles per second. Conversely if the source was moving away from the listener it can be shown that the apparent frequency would be 90 instead of 100 c/s.

The case of the loudspeaker radiating two notes simultaneously is not so easy to work out, since the direction and velocity of the "source" is continually changing, but it is easy to see that a 5000 c/s note emanating from a diaphragm oscillating at 50 c/s would have alternate groups of 50 cycles increased and lowered in pitch.



It can be shown that the output under such conditions can be resolved into a carrier and sidebands, the "carrier" being represented by the original unmodulated high frequency note. The sidebands may be regarded as unwanted distortion and the degree of this distortion may be calculated. Experimental verification of the amount of this type of FM distortion is, however, by no means easy, as other forms of distortion are also present. Ordinary harmonic distortion can be eliminated by first taking measurements over the frequency scale with single frequency inputs, but cross modulation due to lack of linearity in the gap is not so easy to separate since the sidebands resulting from this form of distortion are of the same frequencies as those given by FM distortion.

In the case of cross-modulation, however, the distortion should be proportional to the amplitudes of both frequencies but independent of frequency, whereas FM distortion should increase with the amplitude of the modulating note and with the frequency but not the amplitude of the modulated note.

Quality enthusiasts who like plenty of volume have three courses open if they wish to avoid this type of distortion. They can reduce the amplitude of motion of the cone at low frequencies by increasing its diameter or better still by using horn loading, or they can use separate speakers for high and low frequencies.

... Taken from an article in
"Wireless World"

.....XXX.....

NEW MATERIAL FOR CAPACITORS

Lectrofilm is a new synthetic dielectric material for capacitors, the development of which was hastened by the shortage of high grade mica. This new material finds application in the manufacture of fixed RF blocking and by-pass capacitors used in communications and other electronic equipment. It is available in both rolls and sheets and can be used in present capacitor production lines with very little change in equipment or method of manufacture.

Its strength, chemical stability and flexibility make it suitable for automatic methods of manufacture since it requires little grading or sorting....."Electronics"

XXXXX

CERAMIC INSULATED COAXIAL CABLE

A ceramic insulated coaxial cable is available in long lengths up to 3000 feet or more, in $\frac{7}{8}$ inch diameter. Its special advantage is that it is pliable in comparison to rigid cables due to use of soft temper copper...."Electronics"

CARBON RESISTORS

Although carbon resistors in one form or another are perhaps the most commonly used components in radio sets, it is remarkable how little the average amateur knows about the properties of the various types available. The types at present in use in the order of output are (a) Composition rod (b) Composition film, (c) Cracked carbon film.

The composition rod resistor is a cylinder of material consisting of a mixture of Carbon, either graphite or carbon black, or both together with silica or other refractory material and a binder such as thermo-plaster resin. These are blended in the proportions required to give the desired resistance, moulded into shape and then fired. The resistors are then selected for value provided with leads and then painted. Other insulated types are provided with an outer ceramic tube or are covered with a synthetic resin.

The composition film type of resistor comprises of a film formed by applying a paste containing carbon to a former which may be a ceramic tube or glass rod, and then baking. This film may be spiralled to increase the resistance and that formed on a ceramic rod is then painted with a protecting lacquer. The type produced on glass tube is encased in a moulding material without spiralling.

The carbon film type is becoming increasingly popular and has some superior properties to the two previous types. This resistor comprises a film of pure carbon deposited on ceramic rods or tubes by passing them through an atmosphere containing organic vapours at high temperatures. This process known as "cracking" and hence the resistors are called the cracked carbon type.

The deposit of carbon has fairly low resistivity and the effective resistance of the component may be increased by polishing down the thickness of film or by spiralling by means of diamond or carborandum cutters. Caps and leads are provided and the whole unit protected by lacquer.

The majority of resistors however, have their resistance controlled by the composition of the initial mixture from which the component is made. Due mainly to inherent variations in materials there is a scattering effect about the target value i.e. although a large number of resistors will be near the target value, a proportion will be wide of the mark. It is then necessary to grade the resistors into groups say plus or minus 5% from nominal value or perhaps to a greater tolerance of plus or minus 20%.

The final resistance of a carbon rod type resistor can be controlled by spraying the end of the rod with a ring of copper before covering with lacquer; the width of the ring naturally governs the decrease in resistance.

The resistance of all carbon resistors, will to a certain extent, vary with external conditions. Chief causes of variation are (a) passage of time (b) loading (c) moisture (d) temperature (e) voltage. The accompanying table gives a picture of the magnitude of these changes and a brief discussion of the variations will not be unprofitable.

Due to a packing effect in the carbon particles as they settle down after manufacture, there is sometimes a fairly rapid change in resistance soon after production, but this soon levels out to a slow drift covering the whole life of the resistor. Usually the resistors are not sorted out until sufficient time has elapsed for the initial large change to take place.

The resistance value of a resistor changes during the load and this change is also rapid at first and then decreases in magnitude in a short time. The change is generally greater in the case of the composition film type and least for the cracked carbon type. Composition film type resistors should have a change not exceeding 5 per cent for the first 24 hours or loading and after that only a few per cent per month. The composition rod type will also change to a very similar extent, but cracked carbon resistors should be stable to half per cent, and over a period of several months loading; one or two per cent, should represent the maximum drift.

This load drift will continue, and it is apparent that the time may come when the resistor is outside the permitted tolerance limit. It is therefore clear that the resistor has completed its useful life.

A method of rating a resistor is to base the rating on the surface temperature rise of the resistor. This has some basis in fact since the operating temperature largely causes the resistance changes. These ratings do not differ materially from those usually adopted by manufacturers except that the larger resistors tend to have their ratings reduced while the smaller units have been up-rated. This latter fact may be explained by the fact that a considerable quantity of heat is lost via the leads.

It has been shown that the temperature gradient from the centre to the outside of a resistor is not more than a few degrees. The temperature distribution along the resistor is however, greater, and the temperature rise at the ends is generally 30% less than at the centre. The highest air temperature at which a resistor may be expected to operate is about 60 degrees centigrade, and if a surface temperature rise of 45 degrees C

is adopted as the normal full load working condition, this will then yield a surface temperature of 105 degrees which is generally accepted as highest possible working temperature of a carbon resistor without marked deterioration.

One of the most serious causes of variation in a resistor is that due to moisture. Carbon is very susceptible to water and absorbs it from the atmosphere. In tropical conditions of high humidity the resulting change of resistance may be intolerable...changes of up to 20 per cent from rated values being possible.

Due to the greater delicacy of the resistance element in a carbon film resistor this type can easily become open-circuited. To inhibit this effect, manufacturers protect the resistors by various methods. Composition rod resistors are sometimes covered with a ceramic tube or outer envelope of thermoplastic material. In all cases they are impregnated with wax and painted. The other types are usually lacquered with special water resisting paints. Much work is at present being done on the question of protective lacquers and the problem of a really satisfactory lacquer will probably be solved in the near future. The protection afforded by such a lacquer will greatly decrease the effect of humid conditions on the resistor.

The effect of temperature is almost as serious as that of humidity and in certain cases can be more important. Resistors have a temperature co-efficient which is expressed as a percentage change per degree centigrade rise. In some resistors the curve of resistance with temperature is often irregular, but over a small temperature range the change is approximately linear and it is therefore the practice to regard the phenomenon as a temperature co-efficient. Increase in temperature usually decreases resistance...sometimes up to 0.3 per cent per degree centigrade.

In order to mitigate the effect of high temperatures when it is known that they will work under these conditions it is usual to de-rate resistors and so reduce the temperature rise, but such conditions cannot always be foreseen, and a loss of efficiency results.

A less known phenomenon is the change due to the application of voltage to resistors. This is apparent when measurements of resistance are made by the application of very short pulses of current on a suitable bridge. The co-efficient is expressed as a percentage change per volt DC applied and will vary from 0.001 up to 0.025 per cent. This figure is always negative. These figures appear to be very small, but a resistor may have up to 1000 volts applied and may have consequent variations up to 25 per cent.

One of the most elusive phenomena in resistors is that of noise. On passing a current through the component an increase

of the background noise or hiss is apparent, which does not appear to have any definite frequency characteristic. Associated with this thermal noise is an effect due to transient peaks which is apparently quite independent of the previous noise. The peaks are irregular and occur at irregular intervals. The amplitude of the noise is a function of the voltage applied and is also dependent on the dimensions and type of resistor. With full load the noise may vary from a few micro-volts for the cracked carbon resistors up to a millivolt or so for high values of composition resistors. This effect is naturally important when designing first stages of an amplifier.

The foregoing facts may seem to indicate that carbon resistors as a class are highly unstable, but this is actually not the case. The wide variations will only be encountered in extreme conditions and a good designer will naturally take care to avoid such conditions when designing new equipment. Consideration of the points raised in this article should be of help in this regard.

VARIATIONS OF RESISTANCE VALUE FOR CARBON TYPE RESISTORS			
	Carbon composition rod	Carbon Composition Film	Carbon Film Cracked
Ageing	- 5 per cent +	- 5 per cent +	- 1 per cent +
Loading	- 2 per cent +	- 5 per cent +	- ½ per cent +
Moisture	+ 5 percent normally + 10 percent for tropical conditions	+ percent normally. + 10 percent for tropical condit.	1-2 per cent, but with new finishes should drop to 1% max.
Temperature coefficient in % per degree centigrade	- 0.03 for low values of resistance rising to -0.2 for high values	-0.03 for low values rising to -0.3 for high values	usually from -0.02 to -0.03
Voltage Co-efficient in % per volt DC applied	From -0.01 for low values to -0.025 for high values. Resistors with large bulk tend to have lower co-efficient.	From -0.01 for low values to -0.025 for high values.	Less than -0.01 per cent.
Noise in microvolts per volt DC	Rising to 2 for higher resistance values	Rising to 2 for higher resistance values	Normally negligible

NOTE.. The figure given for ageing represent the extreme changes likely to be encountered, and should be halved for the variation over a period of six months.

From an article in "Wireless World"

TECHNICAL LIBRARY.

This month I have chosen for review two books which should find a ready place in the libraries of those Hams who are interested in laboratory work, and since all Hams are supposed to be experimenters this should cover a wide field.

THE RADIO LABORATORY HANDBOOK...M.G. Scroggie (London..2nd Edn)
400 pages , 21/-

This is an exceedingly useful little book (I say little because despite its 400 pages it is pocket size). As Mr. Scroggie explains it is intended for enthusiastic home experimenters and not dull professionals or alternatively for dignified engineers and not just amateurs. Mr. Scroggie would do well in Parliament.

The development of the subject is carried out along logical lines, beginning with a discussion of the aims of a home laboratory and the general outline of the means of achieving said aims, which is followed by a chapter on premises and layout.

Fundamental principles of Measurements are then dealt with leading up to four chapters comprising a comprehensive survey of instruments under four headings...Sources of Power and Signals, Indicators, Standards, and equipment as a whole.

Practical methods of measurement are then described both in relation to components and complete equipment. A special chapter is devoted to UHF measurements and the concluding chapters show how to interpret the results obtained and give a summary of standard abbreviations, symbols and formulae. An Appendix gives constructional information on bridges.

Since Oscilloscopes are a science in themselves, I am also reviewing: - THE CATHODE RAY TUBE AT WORK... John F. Rider (U.S.A.. 1935)...336 pages, 30/-. Although written over eight years ago this book still holds its place in technical literature due to its solid foundation of fundamentals.

The introductory four chapters cover the theory of the CR Tube, sweep circuits, AC on both plates and descriptions of some commercial 'scopes. The remaining six chapters, comprising about two thirds of the book are concerned with practical applications and contain a wealth of information dealing with the handling of the 'scope, the interpretation of the figures obtained and the arrangements and routine for many forms of checks and measurements possible with the C.R. Tube.

Both copies are by courtesy McGills Newsagency..Melbourne.

Alec H. Clyne - Review Editor.

SLOUCH HATS AND FORAGE CAPS.

True to my contract I'm here again this month, and instead of the job getting easier as time goes on, its getting harder. I know its the same old "growl", but the sooner you chaps realise the fact that I rely on you for the dope to fill these pages the sooner the "Growl" will disappear. Let me remind you that at the moment THE HOOK IS ABSOLUTELY EMPTY, so jump to it and let me have something for next month.

The VK3 Division has received an airgraph from Corporal D. Newton formerly of Castlemaine, and is now serving with No. 3 Squadron R.A.A.F. Central Mediterranean Forces. Cpl. Newton holds an AOCIP but missed his call sign, as his application went in to the RI just four days prior to the outbreak of hostilities. He writes that he is receiving copies of Amateur Radio "and believe me, it's tops...Although I am engaged in radio maintainance in the RAAF I am still keen to join the Ham brigade after the war. Keep AR rolling this way, its hopeless trying to obtain English radio dope in Italy."

Cpl. L. Gravette a new member of the VK3 Division writes from New Guinea, and to quote his own words "until recently had not heard of Amateur Radio and realises I have missed a very interesting publication. (Everyone must find that out sooner or later OM...Ed)

Jack Coulter 3MV writes from H.M.A.S. Mildura and advises that P.O. Tolog who accompanied him to a recent meeting gave him a shock recently, Jack had hold of a HT lead when the juice came on...1500 volts of it...However they managed to enjoy some Xmas cheer...two bottles of it...After passing his 2nd class ticket recently, Jack is now looking forward to his first.

Sgt. G. C. Mikkelson 3XV has been on leave from his unit (I think he may have been married recently). He is moving to school of Sigs at Bonegilla to complete officers course, having already done eight weeks at Woodside S.A.

A letter arrived recently at the Vic Divs. address addressed to Lieutenant Worboys. With the aid of the phone book we were able to find his address and forward the letter on. (The P.M.G. have nothing on us...Ed.) An acknowledgement has been received and we find that Lieut. Worboys is an officer of the British Army at present serving with 3 Aust Corps. He was at one time interested in Radio in the Argentine and wishes the Institute every success in the cause which Amateur Radio has been so great a help in war time and in peace in fostering world understanding between peoples.

Sgt. T. F. Lamb A.I.F. was present at the April meeting of the VK3 Div. He is now an instructor at L.E.C. School of E. & M. E. at Ingleburn.

A welcome note comes from F/O J. G. Golley better known to you as VK3QZ. He is among those who use a Townsville address, which seems to cover a multitude of places, in this case the Group is 991. Very nicely he mentions that Amateur Radio is the link that continues to bind the Hams together, though they are now scattered to the far corners of the Globe...so you misers who hoard your news and send it not to your column....

And now all other States but VK3 please sit up and take notice he says, and like the Yanks, I quote, "just to keep alive the friendly spirit of rivalry, a VK3 was one of the first Australians to set foot on New Britain. I might add that pride was one of the last things he was thinking about at the time, and dignity, in the face of enemy Jap and night bombers was entirely forgotten"...and so all you other States the gage is down...what about it???

He mentions meeting an Army Captain at Canberra who said that Snow Campbell 3MR was captured while he was attached for Army Co-op work. During a heavy dust storm he drove a truck into Enemy lines....I wonder what Snow said. Hi!

QSP to 3CB...thanks for the Needs for Sid Clark, om. They arrived here the next day, which made eight days from Melbourne to Sydney, so they no doubt walked over with them. I sent them on to Sid. Hope you stay longer next trip up this way.

Had a letter from Sid Clark, and he cheers me up very much. I have always regretted that the Navy was not represented in our heading, but lo, and behold, he says both the Navy and Air Force up his way wear Slouch Hats, so my mind is now at rest. Hi! H.M.A.S. Lonsdale please forgive. Hi!

Sid mentions that 3BJ is a Sargeant in a Radar unit near him. W7EZK is yet another W ham who goes to make up their occasional Ham fests. Just quietly, Sid the mess they made of your letter with a pair of scissors was just a shame. Hi.

VK2NO, VK2LZ, and VK2QL have all been on leave in Sydney, but I have yet to get some news from the last two. Don 2No is a pretty regular correspondent, but after his newspaper experience no doubt he has a fellow feeling for those of chase the elusive news.

Peddie Easton well known to you all as VK2BQ I regret to state was killed with the RAAF quite recently. When I think of the DX cards that were always coming through for him he will sure be missed over the air. And so, yet another of our chaps has given his life for us all...vale, Feed, om...may the QRM be nil and Dx even better than you made it down here.

The RSGB Bulletin of February reports that VK2DQ F/Lt Dudley Mourse was, at the beginning of January an inmate of R.F.F. Hospital No. 5 M.E.F. recovering from a "Prang" which put him into plaster for some weeks.

And last but not least the QRA to send your notes is J. B. Corbin VK2YC...78 Maloney St., Eastlakes., or better still the phone number is MU 1092....so what about it?????

D I V I S I O N A L N O T E S
F E D E R A L H E A D Q U A R T E R S

Quite a number of entries have been received for F.H.Q.'s Essay Competition, Post War Amateur Radio, and the Executive have been impressed with the soundness of some of the views expressed, so much so that it has been decided to extend the closing date until 30th June. F.H.Q. would like to have a few more entries from VK3 and also from that enthusiastic bunch of fellows in VK6 who are doing such a fine job keeping the Institute flag flying in Western Australia. Frankly the majority of entries received to date have come from New South Wales. This competition is Australian wide and we want the views of Australia.

Just scanning briefly a few entries, one Ham is very strongly in favor of three types or grades of the A.O.C.P. similar to the American idea. All entrants are of the opinion that the W.I.A. should have a permanent staff. Another feels that the whole of Australia should be zoned with the W.I.A. as a controlling body. From the above you will see that quite a deal of thought has been given to the subject, but we want more views, so come on VK3 and VK6 and all the other States and Servicemen. Don't forget the new closing date, 30th June 1944. Don't just say what you think. Put it down on paper and help remould Australian Experimental Radio.

Recently several VK2 Amateurs have been mentioned in Despatches for meritorious conduct. It is felt that at sometime or other Amateurs from every other State in the Commonwealth have also been honored. If you know of any Experimenter who has been decorated or received any commendation whatsoever, please forward particulars - newspaper cutting if possible - to the Federal Secretary, Wireless Institute of Australia, 21 Tunstall Avenue, Kingsford, N.S.W.

N E W S O U T H W A L E S D I V I S I O N .

The April General Meeting of the Division was adjourned to May in view of the presentation that was to take place at N.E.S. Headquarters the same night.

Members will join with Council in expressing sympathy to George Wilson VK2AGO who recently lost his wife in tragic circumstances, and to our Chairman, Ray Priddle VK2RA who recently suffered the loss of a near relative.

With reference to the Exhibition and Equipment Building Contest announced in the Special Bulletin, forwarded to members last month, kindly note that it will now be held in the Cafeteria, Y.M.C.A. Buildings, and not Room "Y" as mentioned previously.

Some Members have queried the entrance fee of 2/6d. for each Exhibit, but it should be taken into consideration that the prizes

to be won, viz - War Savings Certificates to the value of £5 for first, £3 for second, and £1 for third, are good prizes and really worth striving for. Council realises that the Exhibition will not compare with those of pre-war days, but hopes that quality will replace quantity, hence the value of the prizes. Our old friend Joe Head VK2JR has been approached to act as one of the judges, and if Joe doesn't know his radio, well - no one does. So get going fellows.

The May General Meeting of the Division will be held at N.M.C.A. Buildings on Thursday 18th May, and a cordial invitation is extended to all Amateurs to be present.

-----XX-----

EMERGENCY COMMUNICATION NETWORK.

Well, well, well. What a night! Something to be remembered and talked about in the future. What night was this, asks you in bewilderment. Why the presentation of the Trophy of course. And the winners, Concord.

As previously mentioned, the Department of National Emergency Services had made available their Lecture Hall and arranged a function in conjunction with the presentation of the E.C.N. Cup - a task that the Director Mr. R. Hicks had very graciously consented to carry out.

The D.O.C. (W). W.G. Ryan VK2TI opened proceedings by welcoming the Director, Mr. R. Hicks, the State Operational Controller, Colonel F. Lorenzo D.S.O. Skipper Small, Commanding Officer, Sydney Harbor Patrol and a special welcome to two American visitors, Jim Dimmock and Al Stansfield.

Two short talkies were then shown and then the important business of the evening took place, namely the presentation of the Trophy. The Deputy Controller dealt briefly with the performances of the various stations and then called upon the Director to make the presentation and G. Cole VK2DI briefly responded on behalf of Concord. The Director in his remarks praised the work of the Network and the efficient manner in which traffic had been handled and praised the work of all operators concerned. He also extended a welcome on behalf of his Department to the American visitors. The Director was followed by the S.O.C. Colonel Lorenzo D.S.O. who endorsed the Director's remarks and stated that when endeavoring to arrange co-ordinated practices he had been informed that a certain Thursday in the month was sacrosanct as far as the W.I.A. was concerned, and that it was known the world over as the meeting night of the W.I.A. Seeing the Americans present, he realised that this had been no idle boast.

The Deputy Controller (W) in reply, thanked both speakers and stated that recently the Institute had been in receipt of a letter from the Minister for N.E.S. thanking it for the work done in Civil Defence. VK2TI said that whilst he, on behalf of the Institute, appreciated the Minister's sentiments, felt that it should be the W.I.A. thanking the Minister for the opportunity given to those

"Hams" who had to stay behind, to do a job in Civil Defence and back up their brothers on Active Service.

The second half of the programme was then proceeded with and upon conclusion a vote of thanks was accorded Miss Allen, the projectionist, for the splendid programme she had put on that evening. All those present then adjourned to the Dining Room where supper was partaken. It was truly a very enjoyable evening, and we must not forget the ladies who did so much to help.

At last it has been found possible to co-ordinate Group Control and Radio Practice Nights. Previously the Network had been practicing as a signal unit and thereby lost the benefit of working in conjunction with the Group Controls to which they were attached. Commencing Monday 1st May, practices will be held once a week on alternate Monday and Tuesday nights, and from what we can hear, the band will be reminiscent of Yankee Tone Contests in "the good old days" (?)

With the commencement of the new Exercises another Competition will be held, the Trophy on this occasion being donated by the Department, but although the Exercises will commence on 1st May, it is not proposed to start the competition until a few weeks later.

Earlier we mentioned the presence of Skipper Small of the Sydney Harbor Patrol. You may have wondered why. The Sydney Harbor Patrol is a branch of the N.E.S. organisation who are doing a great job patrolling the Harbor. In the past, their work has been hampered by the lack of two way Radio Communication. As a result of the Network Test, held on 12th December last, and the splendid showing made by Operators, it has been decided to equip the boats with Radio.

The boats will work with both the Police and N.E.S. using two U.H.F. channels that are not very widely separated. To change from Police to N.E.S. it will be only necessary to flip the crystal switch. Several comprehensive tests have been carried out on the Harbor, and there is no apparent difference in signal strength at Control. Reminded one of Dx Contests when we used a couple of crystals and peaked the transmitter midway between each. Shore ship transmissions will be made on a medium wavelength. Funny isn't it. When we started off we were in trucks, now we're in the Navy! A link will be provided between Maritime Control and Central, VL2JJ doing this job. The whole of the Shore installation will be in charge of Training Officer, Charles Fryar, VK2NP.

Skipper Weingott of the Harbor Patrol has a keen bunch of lads under his control, all very anxious to have the Radio installed, and has expressed a wish that they be permitted to participate in our Competition and has challenged the Network. What do you say boys?

In addition to the expansion of the Network to embrace the Sydney Harbor Patrol, it has been decided to link two large coastal industrial towns. This will mean real Dx for several lads. More about this later.

I think it is safe to say that every clear thinking Australian Experimenter is proud of the Network and the work that it is doing. The fact that it is expanding whilst some overseas organisations of a similar nature are exhorting their personnel not to lose interest, is a wonderful tribute to the VK amateurs, and also to the foresight to the Government of New South Wales.

...oOo...

VICTORIAN DIVISION

Members, non-members and friends alike are advised not to miss the next meeting of the Victorian Division. Mr. F. T. Stagg, now discharged by the Army, has consented to come along, circumstances permitting, and give a talk, with photographs. Mr. Stagg, although not a Ham, was connected with an army broadcast station in the Middle East. This should prove very interesting, and it is hoped that members will rally around and provide a good attendance, in this way showing appreciation of Mr. Stagg's offer. The date of the meeting will be Tuesday, 6th June.

We have been advised by F.H.S. that the date of the Essay competition has been extended until 30th June. Very few entries have been received from VK3 members. This is rather serious. F.H.S. have put on this competition in your interests, and it is up to VK3 members to help this competition along with their ideas of post war Ham radio. So chaps jump to it and send your entry as soon as possible.

The April meeting saw a visitor in the person of Jim Potts VE3HI who hails from London Ontario, Canada. Jim is out here to do some in connection with the Army. At the meeting he gave a talk on the Canadian aspects of pre and post war Ham Radio, which was very much appreciated by the gathering.

The possibilities of a Radio Communications Network are still being considered by the authorities, and from information received by Council, the prospects are very good. Last month a demonstration of traffic handling was given by the Hamilton Hams in that town, to the Western District Bush Fires Brigades Conference. The gathering was very much impressed. Tim Wells 3IW was the leading light in the staging of this demonstration. It is hoped that the services of the members will be required in the very near future. By the way, the scheme put up by the Institute was given prominence in the State news service from National Stations recently.

Inquiries have been received regarding the A.O.P.C. examination. The exam is held every six months, on the first Tuesday of March and September. Further information may be had from the Radio Inspector.

THE WIRELESS INSTITUTE OF AUSTRALIA



Divisions of the Wireless Institute of Australia exist in every State of the Commonwealth. The activities of these Divisions are co-ordinated by Federal Headquarters Division, the location of which is determined from time to time by ballot.

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Official Organ : "AMATEUR RADIO"—Published by the Victorian Division.

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The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and on invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

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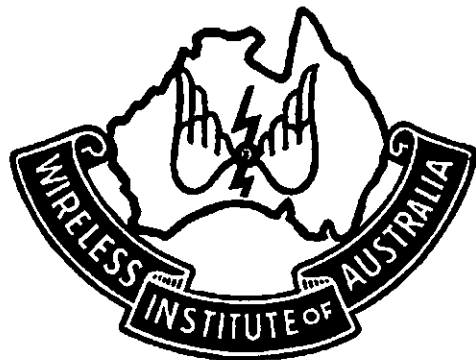
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SIXPENCE

JUNE 1944

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OF
AUSTRALIA



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AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol. 12 No. 6.

June, 1944

A TRIBUTE TO AMATEUR RADIO

There have been rumors to the effect that the radio Amateurs were going to be denied their old frequency bands, and given new bands of such high frequency as to be useless for medium and long distance communication.

Some rumors say "Remember the last War? We are going to get the same treatment this time!"

Now we don't believe the "Hams" should be denied their rightful place on the air in bands suitable for communication beyond the horizon - and further, we do not believe that our Government would want to see those privileges denied.

Are not the "Hams" fighting on many battlefronts, working in war factories and laboratories for a New World wherein the individual will be able to live and enjoy his hobbies, his church and other personal freedoms which go to make up a healthy, happy world?

It is well-known among Government officials whose task it was to build our great war-time communications system that from the rank and file of amateurs came executives, instructors and thousands of engineers and operators. Without this nucleus of experienced men, it would no doubt have taken a much longer time to reach the present high degree of perfection in the communications branch of our fighting forces.

In every emergency Amateurs have proved their ability and willingness to come to the aid of their Country - who would be so unjust as to want to deny them their small place in the radio spectrum? We do not believe these rumors that the "Ham" will be denied his privileges, we believe rather that those who speak so much of justice coming out of this war will see to it that the Amateur receives his just reward.

The entire radio industry knows well, and appreciates the many contributions "Hams" have made for the advancement of high-frequency radio communications, and surely they too can be counted on to assist the "Ham" in regaining his privileges when the right time comes.

So reads the HAMMARLUND MANUFACTURING CO. INC. ADVERTISEMENT in the March issue of "Electronics."

VOLUME EXPANSION

In recent years considerable attention has been given to volume expansion as a means of improving the realism of tone of both broadcast music and the music from direct reproduction of records through amplifiers. There has been much argument for and against volume expansion, particularly in regard to the degree of expansion to be employed, but on the whole, the general consensus of opinion seems to favour at least some degree of expansion.

In view of this interest in volume expansion it has been decided to briefly review some of the methods which have been employed including several which have only recently been suggested in the technical press.

One of the earlier and also one of the simplest methods of obtaining expansion was by utilising the fact that the resistance of a metal filament lamp increases with increase of temperature. They have been used both in simple and in bridge circuits. Information on a simple arrangement of this nature was published in an article by S. W. Amos. Experiments were made with an ordinary 2.5 volt torch globe to see how the resistance of the globe varied as the filament became hotter. The following readings were obtained:--

Volts, across Bulb	Amps through bulb	Resistance in ohms
0.10	0.10	1.00
1.00	0.20	5.00
2.00	0.27	7.41
3.00	0.33	9.00

It can be seen that as the filament heats up there is a considerable variation in resistance. If such a bulb is connected in parallel with the voice coil of a speaker and if the impedance of the voice coil is taken at say, 5 ohms, operation of the unit would be as follows.

Suppose a current of 0.1 amps is passing through the bulb then from the above table, it can be seen that the voltage across it will be 0.1 volts i.e. the bulb is absorbing 0.01 watts. Voltage across the voice coil is also 0.1 volts, therefore the current through the coil will be 0.02 amps, i.e. the energy dissipated in the coil is 0.002 watts. The following table gives the results obtained with different voltages across the coil and bulb.

Amps through bulb	Volts Across Bulb.	Volts Dissipated In Bulb	Speaker Current (amps)	Speaker Energy (watts)	Total Energy (Watts)
0.10	0.10	0.01	0.02	0.002	0.012
0.20	1.00	0.20	0.20	0.20	0.40

0.27	2.00	0.54	0.40	0.80	1.34
0.33	3.00	1.00	0.60	1.80	2.80

It can be seen that as the energy supplied to the unit by the speaker transformer increases from 0.012 to 2.80 watts, the energy which the voice coil receives changes from 0.002 to 1.8 watts. This means that the contrast between loud and soft passages has been increased by nearly four times.

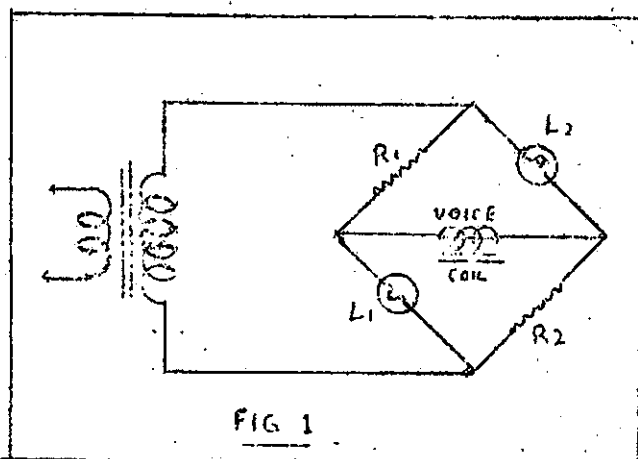
We have assumed that the impedance of the voice coil is constant whereas its impedance actually varies according to the formula -

$$\text{Impedance} = \sqrt{R^2 + L^2 W^2}$$

where R = resistance of coil, L = inductance and W = angular velocity of AC (= $2\pi f$, f being the frequency). It can be seen that as the frequency rises, so does the impedance. This means that at high frequencies the bulb will not perform as well as at low frequencies. Fortunately, however, the inductance of the average moving coil is low so that the increase of impedance is not serious enough to prejudice unduly the performance of the bulb as an expander.

In operation the bulb should light brilliantly on the loud passages and should not light at all on soft ones. This arrangement does not give such good results as other more elaborate ones but is worth trying when one considers the negligible cost and trouble of installation.

Another volume expansion circuit using the same principle i.e. the change in resistance in a globe caused by heating of the filament, is shown in Fig. 1.

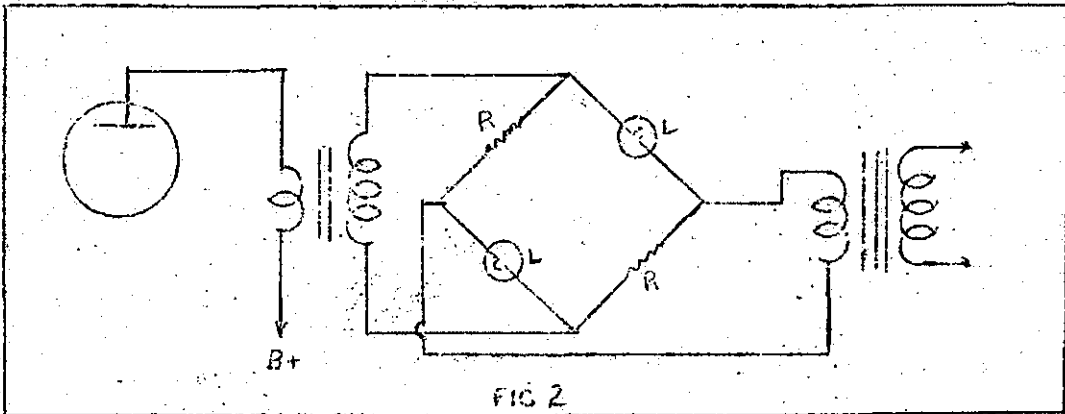


The resistance variations of the two globes are magnified by the bridge arrangement. The resistances R1 and R2 are constant at one ohm. The resistances of L1 and L2 vary with the audio currents passing through them and the stronger the audio signal, the higher the resistance of the globes, and the more the bridge is unbalanced, placing more of the available signal across the voice coil winding.

Due to the thermal inertia of the filaments no measurable amplitude distortion is caused by this method. If the change in

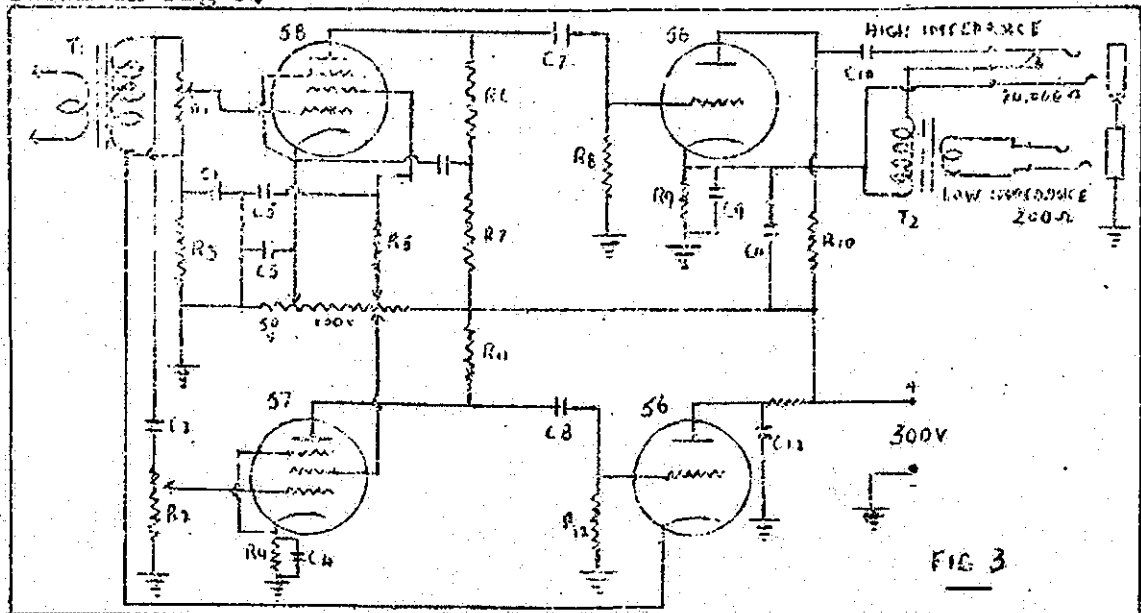
resistance could occur several times a second, appreciable distortion would be produced, but as the thermal inertia damps out any changes over about 20 cycles per second, only the syllabic changes in audio amplitude affect the expander.

A variation of this bridge circuit is to use it between the driver and output stages of an amplifier. Matching transformers are required at each side of the bridge; speaker transformers could probably be satisfactorily used at these points. The circuit is shown in Fig. 2 --



The value of R should be slightly less than the resistance of the globes L when cold.

One of the first expander circuits using valves was that shown in Fig 5.

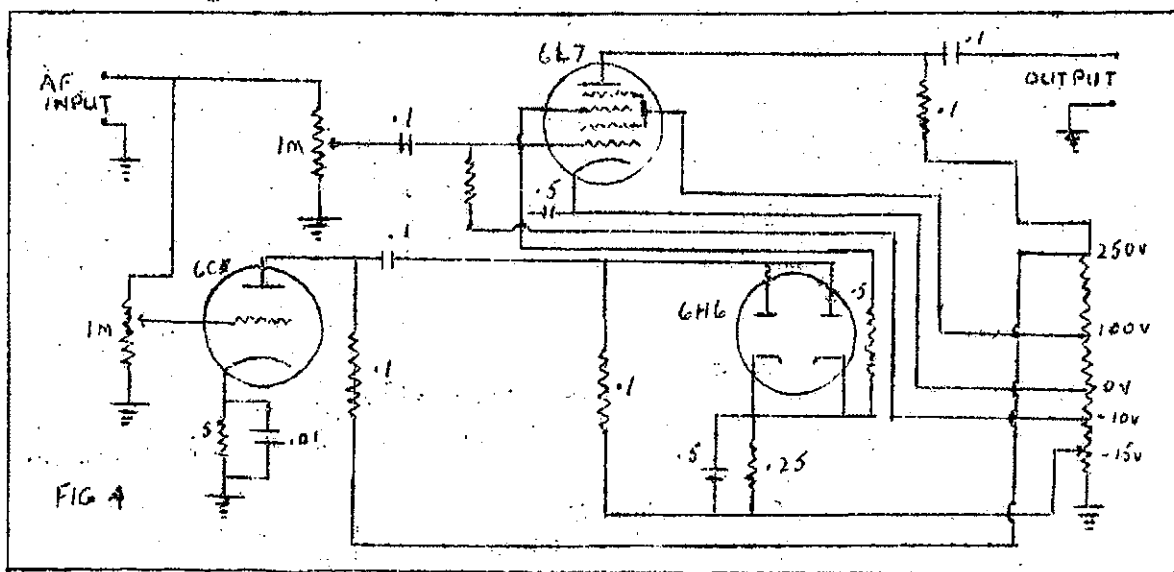


T1 .. Input Transformer	R13 .. 100,000 ohms 1 watt
T2 .. Output transformer (to suit following amplifier)	R14 .. 50,000 ohm (50 watt wire wound)
R1,R2...0.25 meg potentiometer	C1 .. 50 mfd
R3 ... 100,000 ohms 1 watt	C2,C4... 0.1 mfd
R4 .. 5000 " "	C3,C9... 10 mfd
R5,R6...250,000 ohms 1 watt	C5,6,7,10,11...0.5 mfd
R7100,000 " "	C8 0.005 mfd
R8 ... 500,000 " "	C12 ... 4 mfd
R9 ... 3,000 " "	
R10 ... 25,000 " 10 watt	
R11 ... 250,000 " 1 "	
R12 ... 500,000 " 1 "	

The signal input is split between the type 58 and the 57. The bleeder resistance is adjusted to give a static bias of 50 volts on the 58 and a screen voltage on this tube of 100 with respect to the cathode.

When a signal is applied to the grid of the control type 56 tube, the tube asse increased plate current which causes increased voltage drop across R3. This voltage drop is subtracted from the static bias on the 58 tube so that this tube then operates on lowered bias with increased gain. In using this circuit it should be remembered that the type 58 tube has linear characteristics over only a limited range and if distortion is to be avoided, the signal input must be low. Except for this limitation and the fact that the expander is rather cumbersome with its four tubes the circuit was quite satisfactory.

A volume expander using a 6L7 and a 6H6 was described by RCA in one of their application notes early in 1936. The circuit is shown in Fig. 4.



The signal is fed to the grid of both the 6C5 and the 6L7. The output of the 6C5 is fed to a 6H6 and the voltage drop obtained over the load resistor is used as a bias on the third grid of the 6L7, bucking the original bias. The original bias on this grid is enough to bring the amplification of the 6L7 very low. The "bucking" bias from the 6H6 reduces the original bias in proportion to the input signal, so that a loud signal causes increased amplification, i.e. volume expander action is obtained.

It is claimed that signal inputs of up to one volt will not cause distortion, but in practice about 0.1 to 0.2 volts seemed a much safer figure. Provided the input is kept to this figure, good results can be obtained with the expander, but low inputs mean higher overall gain in the amplifier is necessary with consequent need for extra care in guarding against hum, particularly in the first stages of the amplifier.

One objection which has been raised against volume expansion is the fact that loud passages always seem to overload the amplifier with rather distressing results. This can and should be obviated, of course, by having ample reserves of power in the final stage. G. E. Otis, however, in an article published in August 1943, set about the problem of expansion by looking at it from the other direction. He stated that the function of a volume expander could be stated, in what he termed a negative sense, by saying that the gain of an amplifier is made to decrease as the input signal voltage decreases .. i.e. the signal always comes down from a prearranged maximum, thus avoiding overloading the final stage.

Referring to the circuit in Fig. 4, the gain of the 6L7 stage is:-

$$M = \mu.k \dots\dots\dots(1)$$

where k represents the circuit constants and mu is a direct function of the input voltage.

Suppose we assume an ordinary voltage amplifier stage as shown in Fig 5. Here the output voltage E will be -

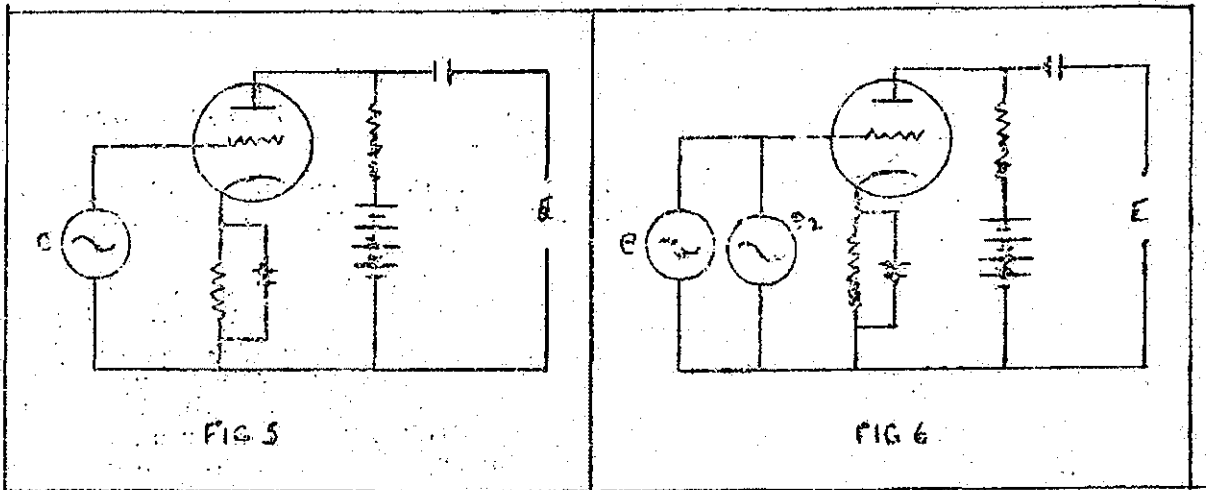
$$E = \mu.e.c \dots\dots\dots(2)$$

where c equals the circuit constants and e is the input voltage.

Suppose that another signal voltage e2 of the same frequency and in phase with e were applied together with and simultaneously to the grid of the tube together with the original signal as shown in Fig 6. The output voltage E will now be:-

$$E = \mu (e + e2). \quad c \dots\dots\dots(3)$$

If e2 were a voltage smaller than e and of the same frequency but 180 degrees out of phase with e, equation 3 would be then written.



$$E = \mu (e - e2) \cdot c \dots \dots \dots (4)$$

The gain of the stage will now equal: -

$$M = \frac{\mu (e - e2) \cdot c}{e} \dots \dots \dots (5)$$

OR if we let e3 equal the effective input voltage, (e - e2) then:-

$$M = \frac{e3}{e} \dots \dots \dots (6)$$

Should e2 be made to vary inversely with e, then as e increases in amplitude, e3 will approach a maximum value of e, since e2 will approach zero. Also as e decreases, e3 will approach a minimum value of zero, since e2 will increase and approach e in value. Under these conditions the negative definition of volume expansion is satisfied and the gain of the stage becomes a direct function of e.

This article will be continued next month.

.....c000o.....

MEASURING CLOUD LIMITS

A photo-electric cell is incorporated in the latest type of meteorological balloon designed by a United States Government research worker. It is used to indicate the lower and upper limits of cloud through which the balloon rises. The variation in light intensity as the balloon rises into and emerges from a cloud cause the cell to vary the transmitter frequency, the changes in which are recorded by a ground station.

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DON'T FORGET THAT THE ESSAY COMPETITION "POST WAR AMATEUR RADIO" CLOSES ON THE 30th OF JUNE ... ENTRIES TO BE SENT TO THE FEDERAL SECRETARY, 21 TUNSTALL AVENUE, KINGSFORD, N.S.W.

THE TECHNICAL LIBRARY

HYPER AND ULTRA HIGH FREQUENCY ENGINEERING

Sarbacher and Edson (New York - 1943) .. 644 pages .. 52/3. Copy by courtesy McGills Newsagency, Melbourne.

In these enlightened (?) days more and more is being written about UHF, some good and some - well, shall we say, not so hot. This volume happily falls in the former category.

The authors have taken pains to approach their subject in such a way that to fully understand the later stages of their book it is necessary to thoroughly absorb the introductory chapters. This is brought about by the fact that while at frequencies around 1-5 M/cs it is convenient and sufficiently approximate to regard the behaviour of the high frequency currents in transmission lines and such as similar to that of much lower frequency currents, this does not hold at Ultra-High Frequencies, where it is imperative to work in terms of electromagnetic fields and electrostatic fields. A case in point is that a single wire used to short a two wire line is reasonably effective at low radio frequencies, as the frequency is raised it becomes less effective, until at UHF it is almost useless and a plate is necessary. The explanation is simple; although the shorting wire carries the actual current it cuts only a very small part of the two fields and these continuing on can easily excite the remaining portion of line and upset the whole affair. The plate to a certain extent overcomes this.

Introductory chapters cover fundamentals of field theory Maxwells Equations and Reflection and Refraction of Plane Waves. Various types of Wave Guides, Transmission Lines, Cavity Resonators Horns and Reflectors are then discussed most fully. The remainder of the book covers behaviour of vacuum tubes at high frequencies also Amplifiers and the various kinds of Oscillators in use at these frequencies including the latest type of all, the Klystron. Appendices are headed Fundamental Constants and Conversion table of units (conversion from electrical units to units used in Field theory).

Although much of the subject matter is fairly mathematical (differential equations, Double definite integrals, Taylor's Theorem Bessel Functions etc) there is also much of immediate practical value, to be obtained from the chapters on Wave Guides, the maths being used mainly to lead up to this subject, and the actual determinations of working dimensions and critical frequencies being quite simple.

I notice that books reviewed in this page have been advertised at prices slightly differing from those quoted here, which are usually the prices marked in the copies loaned to us for review. While we strive for accuracy in this matter it is always possible for errors to occur and we ask readers to regard these figures as a close indication only.

Alec H. Clyne - Review Editor.

SLOUCH HATS and FORAGE CAPS.

Having surveyed the fast diminishing heap of coke and sorrowfully filled up a scoop full, I've got the cosy stove going and now to the notes...if they end suddenly you will know all the coke and heat have departed..and the Yf says "even for Slouch Hats and Forage Caps" not another bit. Oh yes, the Yf's away...but she left two "cockatoos" behind in the shape of Jimmy Jnr. and his brother, Hi: Just a tip, you married chaps...ALWAYS send "all" the Yfs. away with the YF or, otherwise you have to wash up and make the beds, every day, which, as you all know, is an unnecessary feminine invention, waste of manpower too, in war time. Hi!

Had a few visitors during the month which is very appreciated event here at SYCs. First Con Bischoff...W/O of course, to you; he dropped in. Con does his DX these days from one of those Townsville numbers and is well pleased with the job he is on. Anything that involves finding the "bugs" is right into the old 2LZ barrow.

The next visitor was a Corporal in the RAF gray looking for those very rare and almost extinct things called Films. A shot at random revealed he "did have a transmitter before the war" and so I met one G6NU, a Radio Mechanic attached to the Spitfire squadron at Darwin. He had been spending his leave with a cousin a few doors from the shop. But alas, the leave ended and I saw no more of him, but I will find his unit details for you hams up that way.

Then there was a very pleasant surprise to meet GRP's successor as our Canberra Correspondent...one by the name of Smith, whom most of you know as 3RY. It is much nicer and easier to deal with chaps one has met than otherwise...so, when passing through VLS drop in at SYCs.

3RY mentions that the ham family at Canberra is fast losing its members as operations go farther North. At the moment, 2RO, 2ACG and himself are the only ones left up there.

VK5FA is on the way to VK6 and the YF is to join him there as soon as transport can be arranged.

2ANP is now up at Darwin, and still sighs for all the delights of our Federal Capital City, but alas even leave is a year or more in the dim and distant future, sez Jack.

'Tis said that when one 2RC, Bob Chilton, sometime, instructor used to walk into a class, his first request was "Any Hams here? Stand up and give your calls," which is one way of meeting ones QSO's.

Oh, by the way...Sid Clark says thanks ever so much for all the needles everybody sent. He reckons if our circulation is to be judged by the numbers of needles he received...QST isn't in it, hi!

A letter from Bob Stevens 30J reports the irregular arrival of Amateur Radio (now, steady Ed..its due to the Army P.O. he says...) (and sure 'tis his brother 3JO who's responsible for posting all magazines ... Ed.)

One of his main grouses. About their transmitter he has the following secret to divulge "We find our 2RO rig gives very little trouble and does a good job, besides being useful as a "rat trap" (the patent is already taken out...2YC--). One night on one of the rare occasions the set was closed down for servicing, a rat found its way inside, and chose, for its quarters, a spot directly beneath the high voltage

filter condensers. Well, the first we knew of it was a nice ripe smell that at first defied all efforts at location, till at last we got a whiff that left no doubt that it came from within. A brief search was followed by a burial, but the set still gives off a faint odor of defunct rodent, hi! That supper is sure on, too, om.

Yet another ham has been unable to hold out under the continued high pressure salesmanship (ahem!) of our column, and the following news comes to hand from one of the lads. Fl/Lt Pat Boyd (VK3PB to you hams) recently figured in the news for flying home from a raid on Timor on one engine. Pat served about two and a half years in England as a nightfighter pilot, mostly in Beaufighters. Thanks to him, two 88s (oh no, not in this case...love and kisses...its D. Code) did not get home from a night raid. Returning home early in '44, he had some leave but in almost too short a space of time was sent "up north" from whence comes news of this difficult exploit.

Sgt. Chas. Nelson 3WC reports meeting Squadron Leader Walz 4AW...ve gods, Arthur, om. However, congrats...we can still stand a Sqd/ldr at 2YCs and I'm waiting for you to help me dig out that shelter you "helped" put in, hi!

3NY says he had a visit from W6AZC formerly W7HKT Pte Edward E. Squier. He had 15 days leave from a Northern location and is very anxious to meet some of the hams he has worked since 1928. His army address if you have his QSL..is..20937186 ASN Pte. Edward E. Squier, 849 Sig. Detachment APO 928 Unit 2 U.S. Army.

A VK3 on leave from the North is 3GT, Ldc Ray Graf. He has met in the course of his travels Roy Streeter 3RC, Adrian Miller 3AH, both very well known to you all. Also Sqd. Ldr. W. Weston 6MW, Fl/Lt F.A. Hall 6FH, G.S. Bemrose 6NP, T. Ham 4VX and a VK5...quite a representative lot of VK Ham Radio, what!

Fred Luback 4RF is now located at Townsville, which is a very nice spot for A.R. to have an "official correspondent." By the way the poor optimist he wants to buy a couple (mark you) of 2 or 3 gang H type tuning condensers...wouldn't it???? He is "trying" to build a six tube super for after the War..by the time he gets the parts it will be "after".

Our Townsville Correspondent sends the following - "Leo Myers VK2KS an old timer and ex DX hound is keeping the sets "ticking" up here between building himself a receiver or two. Leo spent about 3 years over the other side recently and visited lots of DX.

Cliff Couchman VK4KZ another old timer, but not very active in the good old days" is also keeping His Majesty by handling traffic and assisting win the War.

VK4SR Tom Shoring of low power fame in Nth. Queensland is happily engaged helping the other two. Tom has just built himself another very nice bug.

And so, once more YOUR pages just managed to reach their quota, but you can take it from me that the hook IS empty. All Ham radio is just what we all, individually, make it, but this column is particularly so. Chaps in forward areas look forward to reading where you all are, so spare a moment and drop a line to your Divisional Secretary, or if passing through Sydney, ring MUL092 or better still, come out and see VK2EC...78 Maloney Street, Eastlakes, Mascot. N.S.W.

DIVISIONAL NOTES

FEDERAL HEADQUARTERS

At the last meeting of the Federal Executive the question of the W.I.A. Prisoners of War Fund was discussed at some length. At the present time there is the sum of \$55.5.0 standing to the credit of this fund. Although it is known that quite a number of amateurs are P.O.W.'s, unfortunately the addresses of only two were known and both of these were in Italy. With the everchanging tide of events in the land of the "I's" all trace of these chaps has been lost for the time being. The last we heard of SMR - through courtesy of GRL - was that he was in Poland, whilst nothing has been heard of the whereabouts of ZAKE.

Therefore it was decided that if we could not help these chaps personally it was better to help them indirectly, and the only way to do that was by making a donation to the Red Cross P.O.W. Fund. It was unanimously decided that a further donation of Five Guineas be made to that organisation immediately.

Recently, as a result of a motion from F.S.W; F.H.C. approached the active States with the object of obtaining their views on the issue of Post War A.O.C.P.'s to Servicemen and Women. VK3 were of the opinion that provided that a service applicant could produce evidence - supported by his commanding officer - that his knowledge was equal to or greater than that required by the syllabus for the A.O.C.P., these applicants should not be compelled to sit for an examination. As the States are in favor of this matter, the Department will be approached. Incidentally, this privilege has been granted the R.S.G.B. by the English authorities.

Just to remind members that the Essay Competition on Post War Amateur Radio will close on 30th June. Remember, three prizes may be won, depending upon the number and quality of essays submitted. Frankly the Executive are rather disappointed with the number of entries received from VK3. This goes for both rank and file. Nevertheless, there is still time to retrieve the position "South of the Border." Surely you fellows must have some ideas regarding the post war magazine at least.

.....

NEW SOUTH WALES DIVISION.

At the May General Meeting of the VK2 Division the Chairman in declaring the Meeting open, extended a welcome to quite a number of interstate visitors including P/O Tel. Ray Smith VK3RY, W/O Len Payne VK4LP and Ft. Sgt. Jack Gabeertass VK6GB.

Formal business was soon dispensed with and the evening given over to the visitors who regaled us with short talks of their experiences since leaving their home States. A striking tribute

was paid to the value and adaptability of the Ham in the Services by SKX. Ray told us of a job he has given in the early days of the "Post War Pearl Harbor War." The assignment was a particularly difficult one. Location, parts untrodde n by white men, the need for communication, urgent, the detachment, practically untrained. Ray reckoned that if he hadn't been born snowyheaded he would have been then. Fortunes of war. A ham was found among the detail. Ray's burden very considerably lightened.

Len Payne seemed to be following Jack Howes and Bob Chilton around a lot. Was astounded to learn that Bob was a ham. Jack Gabbertass was very pleased to be able to talk ham stuff again. Now that last sentence brings us to something.

We have been in receipt of the T. & R. Bulletin published by the Radio Society of Great Britain prior to and since the outbreak of War. One thing that has always struck us about Amateurs in the Services in England, particularly those attached to R.A.F. station, is the fact that "minor" hamfests have been held on different occasions. We have yet to hear of anything like this taking place on any of the R.A.A.F. stations. Apparently in England, a good time is had by all on these occasions and many a lie - pardon - tale is told about Dx in the good old days. The R.S.G.B. is usually represented. Surely something like this could be arranged in Sydney or Melbourne. What about it chaps?

Thursday 15th June will be competition night. Remember, you are to have your entries in by 6 p.m. and judging will commence at 7 p.m. The exhibition will be held in the Cafeteria and not Room "K" as previously announced. Three excellent prizes are to be competed for. Advance information as to the number of entries you intend making will be appreciated.

EMERGENCY COMMUNICATION NETWORK.

At the May Meeting of the Division the N.E.S. Cup was on view, and it is certainly a very fine Trophy. We noticed Gordon Cole 2DI, Section Leader from Concord looking at it from several angles. Wonder what the reason was. "Wishful thinking" or "Thoughtful wishing."

The Network is rapidly settling into its new routine with the District Ambulance Controls and at the time of writing four practices have been held and messages handled as follows:-

First week-end	56 messages in	83 minutes
Second " "	66 " "	86 " "
Third " "	46 " "	90 " "
Fourth " "	62 " "	90 " "

With reference to the last week-end, 32 messages were handled in 32 minutes at one stage. Good going, what!

So far very little progress had been made with the Sydney Harbor Patrol section of the Net. The allocation of a frequency and the installation of A.C. at Maritime Control have been the main drawbacks. Once these are overcome, it won't be long and the North Sydney gang will be in action again.

Thursday 6th June should see the commencement of the Competition for the N.E.S. Cup. Pity the poor judges. The efficient manner in which each station is operating will make the task very difficult.

.....

" DOES RIPLEY KNOW THIS? "

Some few months ago a well-known VK2 amateur, to wit, Wal Ryan VK2TI was driving from his home into the City and happened to notice an American sailor a couple of hundred yards ahead of him. As he was about to pass him, the Yank gave a half-hearted "hitch-hike" sign. 2TI pulled up and found that the sailor boy was headed in the same direction and offered him a lift, which was gratefully accepted.

Glancing down at the lad's arm Wal noticed that he was wearing the insignia of a Radio man and the following conversation took place.

"Say, old man, you don't happen to be a Ham, do you?"

"Eh, what?"

As this question didn't seem to register 2TI came to the conclusion that the Yank was "just another operator" but nevertheless repeated the question in a louder voice.

"Say old man, are you a Ham?" Immediately our friend came to life with "Sure I am." Then of course the next question -

"What's your call?" "My call is WBPQW." "What's yours? Why I'm VK2TI."

The foregoing was enough to cause any two hams quite a bit of jubilation, but listen to this.

"Did you say your call was VK2TI?" after answering in the affirmative our American friend replied, "Well you must be Wal Ryan". Again acknowledging, Lee went on as follows. "Do you know a red-headed sailor up in Port Moresby?" Of course this was a pretty tall order, but giving the matter some consideration, I enquired whether the copper top was Syd Clark, commonly known as the "Red Terror of Flinders." Lee said yes. Now listen to this!

"Well Wal, I've just come down from New Guinea and the last chap I saw was Syd, and his last words to me before leaving, was that if I went to Sydney to be sure and look up Wal Ryan, VK2TI!"

It was just too bad that it was after 6 p.m. and all the local hostolries were closed, but nevertheless we drunk each other's health and Syd's health too, in milk.

VICTORIAN DIVISION

Victorian metropolitan Hams should receive this magazine on Tuesday June 6th. They are reminded that at the meeting on that night, it is hoped that Mr. F. T. Stagg will be able to attend. As mentioned in last month's issue, that if Mr. Stagg is able to get along he intends to give a talk on his experiences in running a broadcast station in the Middle East. He also has some photographs which should prove interesting.

The Membership drive being conducted by this Division has up to date been very successful. The help and co-operation from the country members has been the result of many new members being enrolled. Perhaps the metropolitan members could copy the good work of those country members, which would surely result in a further large increase in membership.

Once again Victorian Divisional Hams are reminded of the Essay Competition being conducted by Federal Headquarters. As the entries close on the 30th of June, no time should be wasted in forwarding contributions. The subject "Post War Amateur Radio" should give a very wide scope for Hams to air their views. To reprint the original, or part of the original notification about this competition we quote as follows:- "What are your views on this all important subject? Do you think that amateurs should be granted the same privileges as in pre-war days? Do you think they should be restricted to operating on the higher frequencies? - Should power be limited to 50 watts or a kilowatt or is there a happy medium. Do you think the Institute should have a permanent staff .. Do you think all Amateurs should belong to the W.I.A.? What are your ideas of the post war Amateur Station? - Do you think that Service and Civilian Defence Reserves should be organised and maintained by means of a Government subsidy? - Do you think that the IAG should vest in the W.I.A. the control of Experimental Radio to a larger degree than they did in the past.

For the best three Essays One Pound War Savings Certificates will be given. The closing date is the 30th of June and all entries should be addressed to the Federal Secretary, W.I.A. 21 Tunstall Avenue, Kingsford, N.S.W. and should be endorsed, "Essay Competition."

Council wishes to advise members that there are a few copies of the "ADMIRALTY HANDBOOK" still available. The cost is £1, post free. The proceeds from the sales are to be re-invested in additions to the Technical Library.

A member after reading the book reviewed in this issue, suggests that "a perusal of such a book as this seems to suggest that in the not far distant future a certain eminent member of the VES Division will be altering the sign over his business premises to read "Sanitary and U.H.F. Plumber"

THE WIRELESS INSTITUTE OF AUSTRALIA



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Official Organ : "AMATEUR RADIO"—Published by the Victorian Division.

VICTORIAN DIVISION

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The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and on invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

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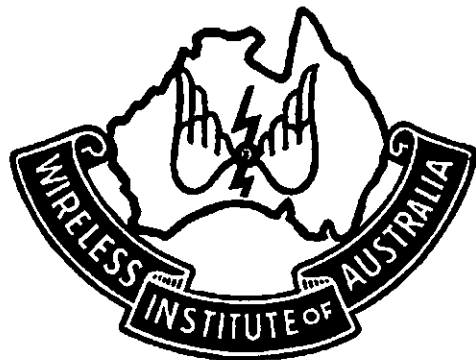
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SIXPENCE

JULY 1944

AMATEUR RADIO

THE
OFFICIAL ORGAN
OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA



Published by the Victorian Division

AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol. 12. No. 7

July, 1944.

VOLUME EXPANSION

Continued from last month.

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From an examination of Fig. 7 it is apparent that in reality the expander unit is a compressor circuit. Part of the input voltage is amplified by the triode section of the 6SQ7 and is applied to the diode plates for rectification. The varying DC voltage appearing across the diode potentiometer supplies the negative bias for grids 1 and 3 of the 6L7, i.e. as the signal increases the μ of the 6L7 decreases. Thus the μ of the 6L7 becomes an inverse function of e .

Portion of the input voltage is also applied to grid 1 of the 6L7 and after amplification appears 180 degrees out of phase with e in the plate circuit.

Since the μ of the 6L7 is an inverse function of e the voltage in the plate circuit of the 6L7 becomes the desired signal voltage e_2 required to satisfy equation 6 for volume expansion by negative definition.

The value of R_x has not been listed but will have a value depending on the pickup and the type of needle used. For instance, with a good quality pickup and fibre needles the resistor could be eliminated but with a steel or jewel needle it would need to be about one megohm.

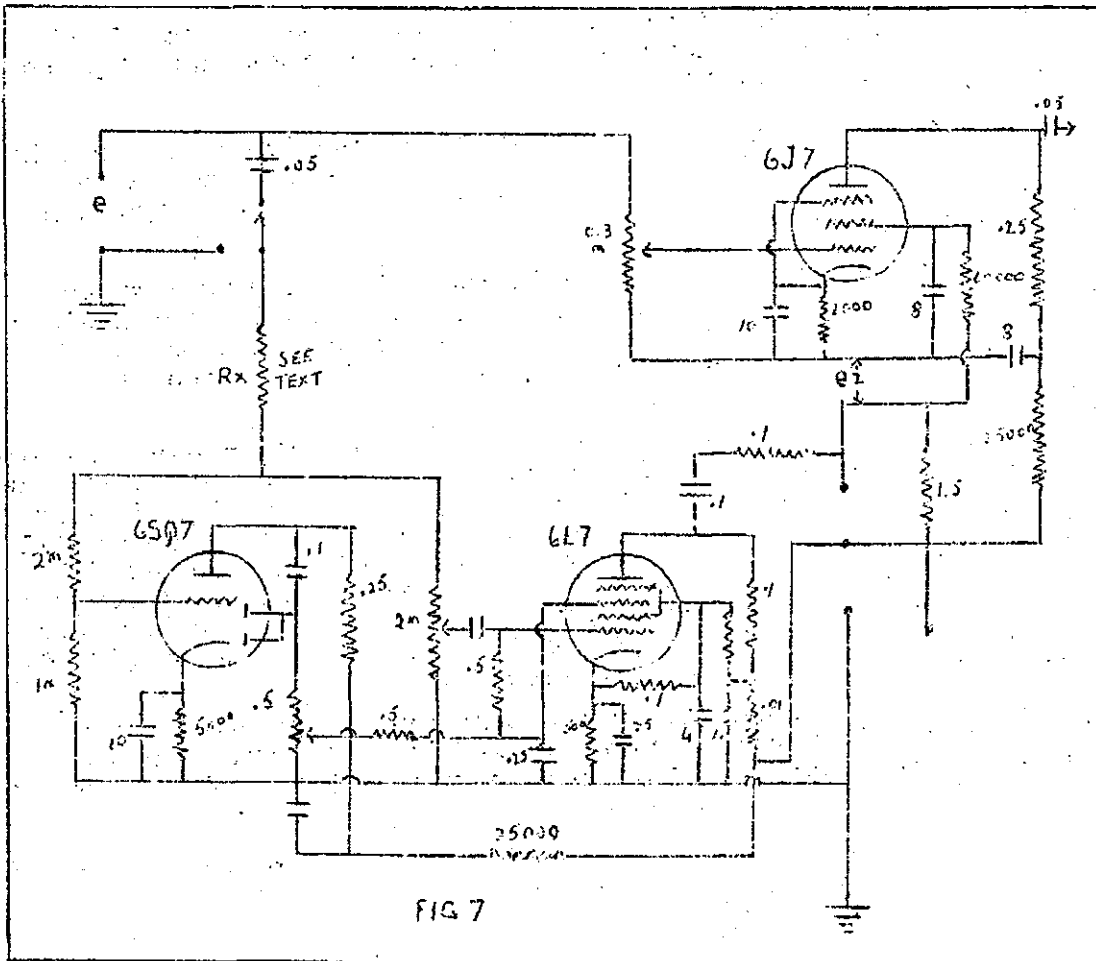
Adjustment of the expander may be carried out by ear. Referring to Fig. 7 set controls R_4 , R_6 and R_{16} to ground potential. Now apply a signal and turn R_6 until a comparatively small signal is heard in the speaker output; this represents e_2 . Adjust R_4 until plate current cutoff is reached by the 6L7 on loud passages (the signal in the speaker will fade out). Finally turn R_{16} through the zero-signal point to the setting of maximum volume for loud passages. If the soft passages are too quiet reset R_6 to give a lower value of e_2 and repeat the procedure.

The distortion inherent in the conventional volume expander on large input signals is eliminated in this circuit. Since as the signal input increases the plate current of the 6L7 approaches

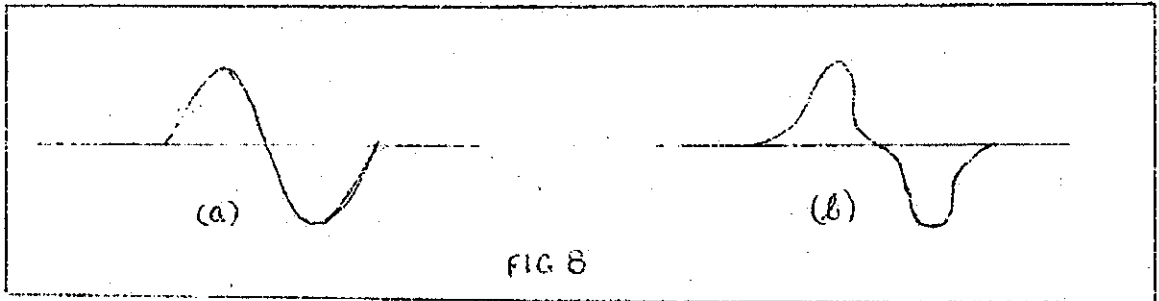
cut-off, e2 will become ineffective and distortion cannot occur.

It should be noted that no change in fundamental amplifier design is necessary aside from the screen circuit of the input (mixer) tube; for example, with good design negative feed back voltage may be brought back from the output stage to the cathode or oven screen of the input tube without consequent regenerative oscillations.

During the last year or two there has been considerable discussion in English Radio journals regarding the pros and cons of volume expansion. D. T. N. Williamson, writing in "Wireless World" has made considerable contribution to this discussion and in that journal he recently described an expansion unit which differs considerably from the majority of those previously published. He lays particular stress on the rate of increase and decrease of amplification in the unit.



It is necessary to arrange that the gain of the amplifier varies with the variations in intensity of the signal. A steady signal requiring a constant gain consists, however, of cyclic variations at audio frequency and if the gain were to alter instantaneously it would follow these cyclic variations and alter the wave form shown in Fig. 8 (a) to that of Fig 8 (b), thus producing objectionable distortion.



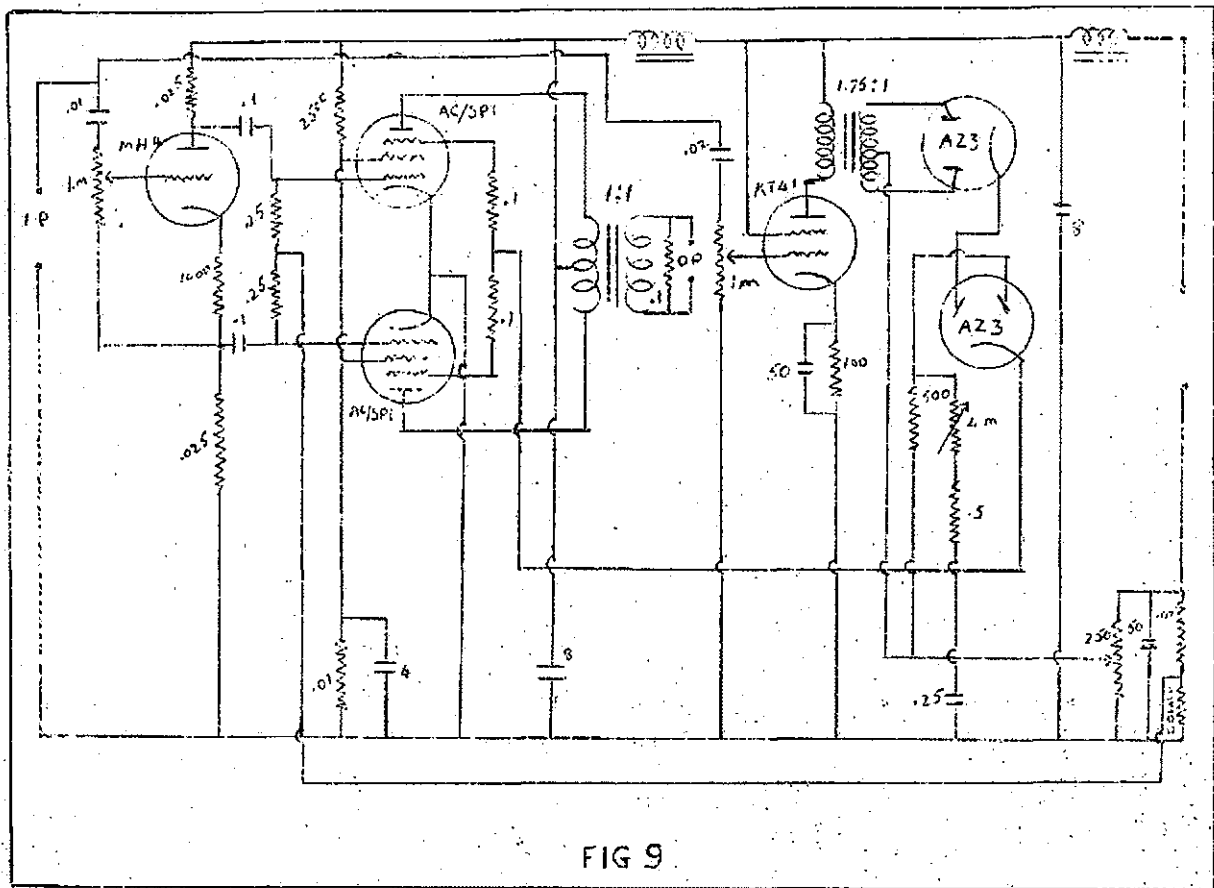
Therefore it is necessary to introduce some form of time delay. By this the rate of change of gain is reduced. If the rate of rise is reduced, however, poor transient response results. On the other hand, if the rate of fall of gain is reduced, transients are obviously unaffected as the transient ceases practically instantaneously and after it ceases, the way in which the gain varies doesn't matter.

In acoustics the maximum rate of delay of a signal is generally considerably less than the maximum rate of rise. It is thus apparent that the gain of the amplifier should rise very rapidly and fall at a relatively low rate.

In the usual form of expander the rates of rise and fall are approximately equal and the writer claims that this type of equipment can only give mediocre results. A time for fall of gain of about one second is found to be satisfactory and has the advantage that "flutter" does not occur due to large fluctuations of gain when reproducing music such as the final bars of the Beethoven 5th Symphony i.e. loud chords separated by short time intervals.

The most convenient means of obtaining volume expansion is undoubtedly a variable gain amplifier controlled by a voltage derived from the signal, but for low distortion most variable gain amplifiers must deal with only low signal levels. A separate amplifier must therefore be provided to obtain a suitably large voltage which is then rectified and fed to the controlled stage through a filter network, by means of which the time delay is introduced.

Fig. 9 shows the circuit of an expansion unit which is designed to embody the foregoing principles. The tube V4, the control amplifier, is a high slope output tetrode designed to develop a
rectified



voltage of about 30 volts peak in the load resistance R14. It will be adequately loaded by the output of a crystal pickup. R15 and R16 in conjunction with C8 determine the time of fall of gain and this should be about one second. R15 being variable allows some control of the delay period; R16 setting a lower limit to prevent distortion.

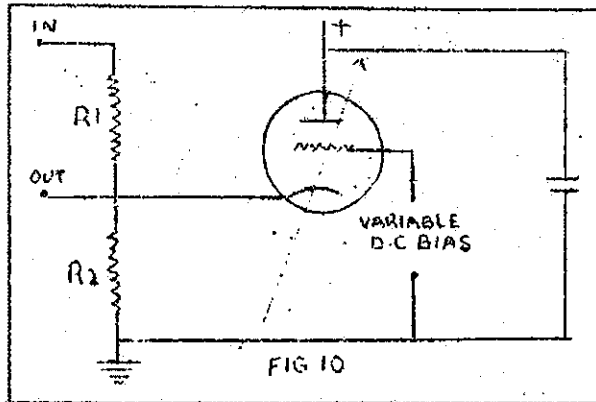
Experience has shown that about one millisecond is a satisfactory time for the rise in gain and this figure is obtained with the circuit shown.

The use of an extremely high rate of gain causes difficulties in the amplifier. The rise in anode current which accompanies an increasing gain gives a violent transient. With a single controlled valve an objectionable noise is caused. The use of push-pull however, causes cancelling of the transients, provided balance is correct. Push-pull also minimizes risk of distortion.

It is necessary to use transformer coupling from the push-pull stage to the input of the main amplifier. As, however, it has no resultant DC magnetisation and only handles low voltage signals, it should introduce little distortion. The method of controlling the amplification of the valves gives some scope for experiment. In this case control voltage is applied to the suppressor grids. R9 and R10 are included to prevent these grids being driven positive.

The following procedure is essential for correct operation and should be carefully observed. With the sliders of R12 and R17 at the chassis ends, R1 is adjusted in conjunction with the volume control of the main amplifier so that the latter will be just fully loaded with the loudest expected signal. R17 is then adjusted to give the desired increase in contrast. R12 is advanced until the loudest signal just causes the suppressor grids to be at cathode potential. Further volume control should be by means of R1.

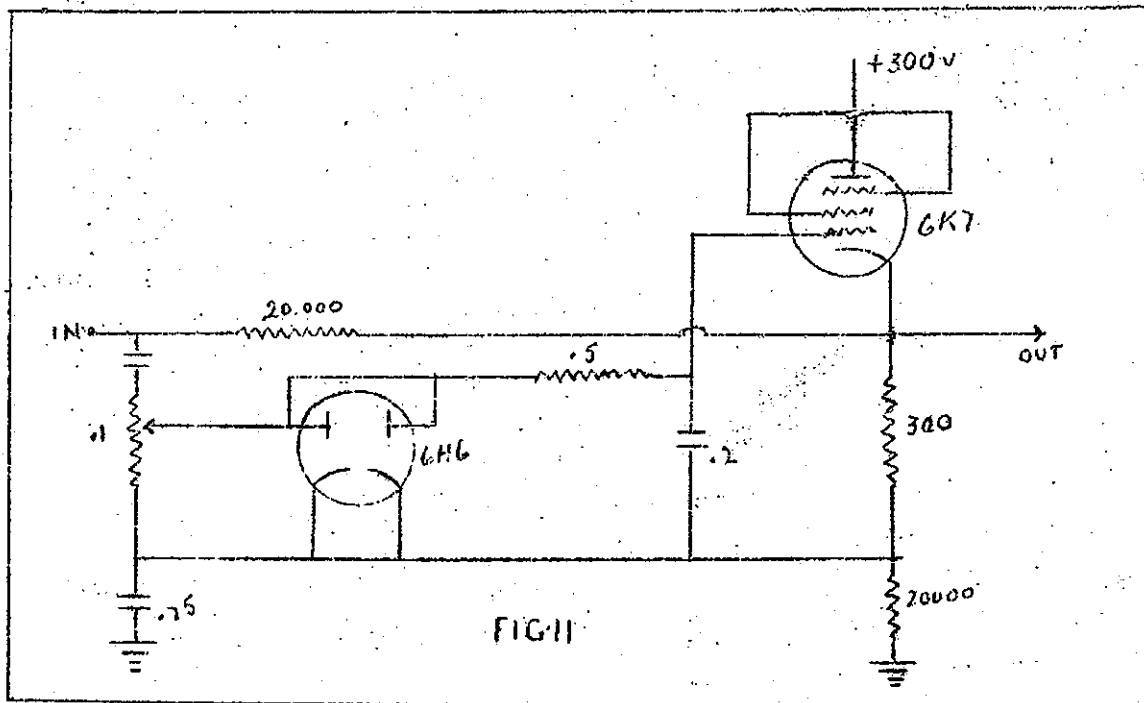
It is claimed that quality of recorded music reproduced by this equipment is greatly enhanced and a considerable improvement results from the apparent reduction in surface noise which takes place due to the expansion process.



Finally (and it seems a darn long time since I started writing up this stuff!) we have a circuit recently devised by M.O. Felix. It uses a type of cathode follower stage, the simplified circuit of which is shown in Fig. 10.

Now the output impedance Z of the cathode follower is $1/g$, where g is the mutual conductance of the valve. Assuming $Z \ll R2$ and $Z \ll R1$ we can write $V(\text{out}) = V(\text{in}) \frac{Z}{R1}$

The output is thus inversely proportional to the slope of the valve. Using a variable mu pentode strapped as a triode, this can conveniently be varied by a DC bias on the control grid.



The complete circuit is shown in Fig 11. Using a 6K7 a change of only 10 volts in grid bias varies the slope from about 2 to 0.2 ma/volt. This is equal to a change of about 18 db.

Advantages claimed are that this circuit will handle voltages up to 20 without distortion, it does not require a separate amplifier before the rectifier and as the output impedance is low the output may be taken via a screened lead for some distance if required.

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RADIO POWER OPERATES LAMPS

The application of high frequency radio waves to lighting homes and public buildings was recently demonstrated. It was shown how brilliant vari-colored fluorescenc tubes could be fully lighted without being connected to any electrical wiring. The generator used was a diathermy set.

Experimental lamps which consume less than an electric lamp and which may be left burning night and day for such jobs as lighting clock faces were demonstrated.

.....XXXXXXXXXX.....

READERS HAVE THEIR SAY.

Readers are invited to express their views on any subject relative to Amateur Radio. The views expressed are not necessarily those of the Management.

Editor,
Amateur Radio"
Sir,

Well, wouldn't it!! After reading Federal Headquarters' Notes of June 1944, I was so amazed at their proposed approach to the Radio Inspector's Department regarding FREE A.O.C.P. issues to ex-servicemen and women, that I just had to put pen to paper and voice my disapproval for the following reasons:-

1. A C.O. of a unit invariably has not knowledge of Wireless and therefore cannot judge a person's qualifications regarding same; he would have to rely on his junior officers for information. An instance of this is shown in Infantry and Artillery units who have signal personnel under their control. They are usually men who specialise in infantry and artillery alone and know nothing regarding wireless. The same applies even to a Signal unit. The C.O. may have come from any other section of Signals other than wireless.
2. There would be far too many abuses of the privilege for reasons above.
3. If a person has the knowledge required it would be no trouble for him or her to sit for an examination to obtain the licence.
4. A man may be a good technician, but may have little or any knowledge or practical experience of operating and vice versa.
5. It would definitely make all A.O.C.P.'s that have been issued become very cheap indeed.

I have spoken to a few Hams regarding these free issues and all seem to be of the same opinion as quoted above. What have other Hams to say on this matter, especially our brother services, the Navy and Air Force. Here's hoping the Department does not grant the privilege, thus nipping in the bud a little more "graft" that would arise in the services.

Yours faithfully,
R. HIGGINBOTHAM .. VK3RN
V255902

.....

SHORT WAVE BROADCASTING FROM ENGLAND.

Great strides have been made in short wave transmission in the past few years and with the increased number of transmitters the B.B.C. is literally "calling all nations" in forty-seven languages. Whilst for secrecy reasons it is not possible to say how many transmitters are at present in use, it is significant that fourteen short wave-lengths can now be employed simultaneously.

xxxXXXXxx

THE TECHNICAL LIBRARY

ELECTROMECHANICAL TRANSDUERS AND WAVE-FILTERS

Mason (New York---1942)335 pages42/6

This book covers the theory of various types of electro-mechanical filters, such as piezo crystals and magnetostrictive rods, and is quite definitely a specialist work.

The subject matter is covered under the following chapter headings:- Introduction, Electrical Network Theory, Application of network Theory to Lumped Mechanical Systems, Acoustic Equations and Networks. Vibration of Membranes and Plates. Electromechanical Converting Systems, Design of Electromechanical Systems, Application of Electromechanical Impedance Elements in Electrical Wave Filters.

Appendices deal with (A) Motion and Impedance of a Bar Vibrating in Flexure, Taking Account of Rotary Inertia. (B) General Wave Propagation Taking Account of Viscosity Effects. (C) Elastic and Piezoelectric Equations for Crystals .

Most of the above is treated in a solidly mathematical manner and for this reason and due to its specialised nature this book is recommended only to those who would delve deeply and often into this particular subject.

.....

ELECTRICAL FUNDAMENTALS OF COMMUNICATION

Albert (New York 1942)554 pages 29/9.

For some reason for which I have never been able to fathom there have, in the past fifteen years been very few good books on straight out electrical fundamentals. I might even go so far as to say that they can be counted on the thumbs of one hand. Here, however, is a book which, while not exactly in the straight out electrical class, being written from the communication angle, nevertheless calls for another finger being brought into use.

Commencing with Fundamentals of Electronics (a wise beginning) Mr. Albert labels his second Chapter D.C and follows up with a discussion of Conductors, Insulators and Resistors. The DC section of the book ends with a chapter on DC Power and energy. The next six chapters deal with Alternating Currents as follows:- Inductance, Electric Fields and Capacitance, Electric Measuring Instruments, AC Circuits and Algebraic Representation of AC Quantities.

The remainder of the book presents a smooth transition from the above purely electrical topics into their application to communication engineering, under the headings of Electrical Networks, Bridge Circuits, the Transmission of Electromagnetic Waves, Fundamental Principles of Vacuum Tubes, Vacuum Tubes as Circuit Elements and Electroacoustics.

Appended is a set of tables of Natural Trigonometrical Functions. The whole book is easy reading and well set out with plenty of diagrams and altogether very useful....Alec. H. Clyne....Review Ed. Both copies by Courtesy McGills News Agency Melbourne.

SLOUCH HATS and FORAGE CAPS.

June...half another year gone, with the Nams still scattered everywhere, the old rig still collecting yet more cobwebs, and the PMG still holding all that Transmitting Apparatus...and much more important we still get just enough notes to fill these pages, the Magazine still goes on and a core of keen men in most states still keep the Divisions functioning under very great difficulties for all you chaps away.

They tell me that Morrie Meyers 2VN had a pretty good time up at Aitaip...of course I mean Mr. Squadron Leader Meyers...he being now an Officer and a Gentleman, like Johan 3RJ, reckons he is. Hi! My Intelligence didn't have any further information so it is up to Morrie to let us know what happened. I also heard he spent eighteen hours at sea in one of those US.MT.Bs on a nice choppy sea, but he did not mention how much of his breakfast he lost on the journey, Hi! Anyway, Morrie those 127s were worth a story???

Having turned Fl/Lt R.E. Jones, one 3RJ into quite a good New South Welshman...fact he now has a little Miss NEW come to live with them for good. Well, his education being finished he is now about to depart for a station somewhere north. Naturally, another Ham 3RJ is taking his place, of course. Clever work Ray to go away and leave all the night walking to Mrs. J., not that a VK2 baby would do such things.

Bill Sievers announces himself back again in VK3 after the Course at Bradfield...ok, Bill, Ray and I were only wondering while at supper the other night, just where you had gone to, Hi!

Last month I had a paragraph too many Fred (VK4RF) in your notes and it had to be deleted. As it mentioned that you had NOT put any address at the top of your notes I think I had better put it in here. Not that you hope for a reply. I know, Hi!

Edgar Foreman VK4GF entertains 4RF on his leave periods and Ham Radio is discussed to the full. A visitor to Townsville recently was KAIBS, while 4EL has returned to Brisbane after spending 12 months at 4QN. What do you know of KAIBS, Fred?

VK3EJ Pilot Officer Don Gilder writes from London via Airgraph. Don was another of the boys to obtain his call just prior to the war and hopes to catch up operating hours when the great day comes and the dust is dusted from the rigs again. Don has met a number of G's and also contacted quite a bunch of W's in the states last year, so he has many friendships to renew via 14mc.

Sgt. Harold Ackling VK2PX was down in Sydney for a spot of leave and was looking forward to a WIA meeting only to find it had changed quarters for just that night! Hard luck Harold on. We would all be glad to have seen you...but what was wrong with the telephone...it's not 7mc, I know, but it serves. Hi!

.....

P/o Sid Clark says that he met W3ELO, one ensign Carter of the USN who enquires for VK4EI, VK2AF and anyone else he may have worked pre-war. Address is Ensign Carter R.U. ~~US~~, 1 Navy 717 USN. Syd also mentions ZAAC another Clark, initials R.G. & Arthur Stahl W3IPO; Vk Har radio is also represented up there by VK4EF and one Bill Arnold who assisted the Ole VK2LZ in his early excursions on 200 and under.

We regret to learn that Jack McCandlish VK3IRW of Sea Lako has been posted missing since June 1944 from a Commando Unit. A letter from his Mother expresses complete confidence that he will eventually be reported safe.

VK3XP Reg Sankey is at present located at 3STP, RAAF Ultimo...and that is no great distance from VK2YC or 2Tis, CM.

VK3UO F/Lt. C. G. Harvey is another of the old timers who has been located in the RAAF and is at present Stationed at Parafield, whilst VK3AG Flying Officer George Glover may be located at Group 788 Darwin.

VK3DS Lt Geo. Lance of the 11th Aust Heavy W/T Sec AIF writes that he has met lots of Hams, but he forgets to say who they were. Perhaps, the arrival of one junior Op named David has made him a bit forgetful. Congrats George, and may the days of his brasspounding be long, and under better conditions.

Notes from Captain D. B. Knock one VK2NO are quite easy..I simply quote"....

So many Hams gather at a table occasionally in the Mess at Vic Barracks Melbourne, that certain Wing Commanders (not Hams, of course) sheer off in alarm and sit at other tables where they may at least understand the conversation. Hi! Other non-ham officers seem to be intrigued and likely to be bitten by a well-known "bug" after the War. VK2NO reckons its a pity that Hams don't wear their call signs in some way for identification among the fraternity, but, alas, such is tabu on uniforms. Wouldn't be a bad idea for service hams to wear "special" colour patches bearing call-signs. Hi! How many fellows who are old friends over the air have passed each other by in this war will never be known. VK2NO & VK4AW met after a few years, dined and took in a Movie show in Melbourne. They had much to discuss and 4AW made 2NOs mouth water with tales of Jap gear in the Islands. VK3 Div had better be prepared because a large number of Hams of all Services are threatening to descent upon a Monthly Meeting..the main trouble is to co-ordinate such a gathering, so many are on duty when the others aren't.

VK2XQ is away from VK3 on a VERY important mission. It won't be "Hush-hush" (or will it??)...he has to introduce himself as proud "Pop" to a recent arrival on his domestic hearth." Thanks Don, om., it was very handy (2YC)

And so ends the notes for June.... and we once more start watching the mails till there seems to be enough notes for July. So get a move on all you adventurers....QRA, 78 Maloney St., East-lakes Mascot.....or better still Phone, NU1092.

.....000.....

D I V I S I O N A L N O T E S

NEW SOUTH WALES DIVISION

The Exhibition that was to have been held at Y.M.C.A. Buildings in place of the June General Meeting has been postponed to a date to be fixed.

It is anticipated that at the July General Meeting to be held at Y.M.C.A. Buildings on Thursday 20th July, quite a deal of information will be to hand with reference to the Bush Fires Net.

WANTED .. Articles for "Amateur Radio" by VK2 members. Some considerable time has elapsed since this Division forwarded articles to the magazine committee. Articles dealing with any scientific topic related to radio would be welcomed.

....oOo....

EMERGENCY COMMUNICATION NETWORK

It has been decided to commence the Competition for the E.C.N. Cup on Tuesday 20th June and by this time the first round will be nearing completion. In the past it was the practice to commence each round on the first Friday of the month and end on the last Friday. This procedure has been slightly altered. In future each round will commence on either the Monday or Tuesday night, depending upon which night the exercise falls, following the Monthly General Meeting of the Division and will conclude on either the Monday or Tuesday night preceding the next General Meeting.

This change will mean very little to the actual competition, but will help the magazine Committee considerably. As you are aware it is necessary for "A.R." to go to print on a certain date and as all the work is done on a voluntary basis by members of the VK3 Division they have to have certain definite times for cutting stencils, printing and posting. By concluding each round of the competition on a day before the General Meeting will mean that these Notes can be despatched earlier.

The Radio Room at Central has now been completed and it is something that the Amateur movement may be well proud of. Most operators are conversant with the location of this room and know that it is a long but fairly area but when they visited it last, very little Radio equipment had been installed. In an endeavor to describe Central, I will assume the role of a visitor to VL2JB on any practice night.

Arriving at the door of the Control I see on my left two desks at which three operators are working. On the desks are a telephone,

Message Files, Receiver, Microphone, Speech Amplifier and Remote Control apparatus for both Receiver and Transmitter. Immediately in front of me is the main transmitter, VL2JB. This is of Rack and Panel design and in pre-war days was quite well-known on all amateur bands. This transmitter uses a pair of type 808 valves in push-pull and these are modulated by a pair of 809's. The R.F. driver section consists of 6V6 crystal oscillator, two 6L6 doublers and an 809 buffer. Over on the Control desk is a map of the metropolitan area showing the location of the various D.A.C.'s.

To the right of the transmitter are two other desks on which are two receivers. This section of the installation monitors signals both to and from the Sydney Harbor Patrols, M.S.B. Shore Station and the Police. The first Receiver is a medium frequency unit and covers Police transmissions and Shore-Ship messages. The second Receiver is a crystal-locked unit and is tuned to Ship-shore transmissions on a frequency of?? Over these desks is a map of the Harbor showing the various areas in which the boats are operating. As each transmission is made the operator logs it on a pad provided for this purpose.

The time is now getting on towards 8 o'clock. A series of telephone calls show that the Network Stations are signing on. As each station rings through, the call is noted and correct time given and the Deputy Controller or his assistant informed. It is now 8 p.m. and VL2JB goes on the air and each Network station is called up and signal reports are exchanged. When the last station has been checked in a few brief announcements dealing with W.I.A. or N.E.S. matters are made and then operators settled down to the business of the evening.

At 8.15 p.m. a general air of expectancy is noted and a few minutes later the first message comes through. It was mentioned earlier that at the two desks at the left of the transmitter three operators were seated. It may be as well to state their duties. Operator No.1 is at the Receiver and when the messages are coming through, they are taken down in duplicate on the requisite form by him. When checked back to the originating station they are handed on to Operator No.2 whose duty it is to log all transmissions and when logged, initial each message form and pass it on to Operator No. 3 who detaches the carbon copy, files it, and hands the original to a messenger who delivers it to the Officer in Charge of the Ambulance Control. In the meantime internal messages are being handed to the Deputy Controller and from these he is making up the Wireless Report that is transmitted each quarter hour. This Report, although considered a mass of figures at first really gives each outlying station some idea of what is happening in the other Groups.

Time is marching on, it is now 8.45 p.m. and messages are starting to pour in and all stations have quite a deal of traffic to handle and the band is reminiscent of 19200 kcs around about the beginning or middle of March in any pre-war idea. Eventually stations are sorted out and although QRM is rather solid at times, very few repeats have

to be asked for.

It is now 9.15 p.m. and as each station "clears the hook" it is given the ok to close down. Every endeavor is made to see that stations take it in turn each to be first to clear traffic. As each station closes down, any errors made with procedure etc., during the course of the exercise are pointed out to the offenders in no uncertain manner.

9.30 p.m. All stations have signed off and VL2JB stands by for any calls, then closes down. A resume is then made of the number of messages handled both inwards and outwards and a Report made at the S.O.C.

To date Network activities have been confined to Metropolitan Members whilst Country Members have, of a necessity, had to more or less, take a back seat, but without wishing to raise anyones hopes too high, it is anticipated that in the very near future they will be given a very important job to do.

In the past it has been stressed time and time again that the E.C.N has been a wonderful avenue in which to bring under the notice of Governmental bodies the value of the Australian Amateur. At present the Bush Fires advisory Committee are considering the possibility of using Experimental equipment in order to combat this summertime menace to Australian lives and property. It is anticipated that in the very near future Country Experimenters will receive a circular setting out details of the proposed scheme and asking co-operation.

A few personal pars:-

- VL2JC. Still going great guns. Just about the most enthusiastic station on the air. Handles more traffic than any other station, supports all Institute activities 100% including the Essay Competition and Exhibition. All four operators, Gordon Cole VK2DI, Eric Fugh 2ADK, Bill Lukes 2WD and Phil Cox VK2IE all reckon they're going to pull off the Cup again.
- VL2JE - Still fighting with VL2JL to see who puts in the strongest signal at Central. George Wilson VK2AGO seems to be putting in a lot of time at the station. Now that the V.D.C. is on the Reserve we might hear "Foggo" Reed 2DR sometime. By the way Jack, the genny still only gives 250 volts (sometimes).
- VL2JK - Still doing a good job under difficulties. Ken and Charlie gave me quite a shock one night when they described how they tuned the aerial! Ern Hodgkins still keeps their feet on the straight and narrow. Say, Ern do you ever Physco-analyse these lads. Member when you did it to me?
- VL2JL. "The Noise of the Network". R9 plus and then some. Network personnel will regret to learn that George Littlefair has had to resign from the position of Section Leader due to illness in the family and all Members will wish his wife a speedy recovery. George Patterson 2AHJ is the new S.L. and with 2TN Don Dunstan and Len Dutton and 2HP sometimes - why not always om - reckon they'll be there when the whips are cracking.

VL2JP. Ah! The DX of the Network, Bob Fussell 2SS, Eric Dickson 2AFM, Ron Richardson and "Flying Officer" Higgins 2LO are still having "Copper QRM" What will you do if they bring in some of the inmates (?) of the Industrial School boys? All young married men too. Higgo is a great guy, but forgets to bring the Minute Book sometimes. What are you going to do with that key you exhibited (?)

VL2JJ Want to know when in the ???? they are going to get some A.C. Network personnel will join with all Institute Members in expressing sympathy to George Shelley VK2QF who recently lost both father and mother in the course of a few months.

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- VICTORIAN DIVISION -

The Annual General Meeting of the Victorian Division will be held on Tuesday, August 1st, at the rooms 6th floor, Law Court Chambers, 191 Queen Street, Melbourne. The business of the meeting will be:-

- To receive and adopt the minutes of the last Annual General Meeting.
- To receive and adopt the President's Report.
- To receive and adopt the Balance Sheet for the year ending 30th June, 1944 .
- To elect a President.
- To appoint an Auditor
- General Business.

Nominations for Council, which have been posted must be in the hands of the Secretary not later than Friday July 14th. Candidates must be full members and must be nominated and seconded by full members all of whom must be financial at 30th June, 1944.

Members subscriptions are now due, accounts have already been posted, and members are requested to complete the form at the bottom of the account forms and return to the Secretary.

For the benefit of members who are unable to attend the Annual General Meeting, the President's Address will be published in the August issue of the Magazine.

Congratulations to Ivor Morgan 3DH, and his wife on the recent arrival of a Junior Op....We haven't seen Ivor for some time????

.....oOo.....

THE WIRELESS INSTITUTE OF AUSTRALIA



Divisions of the Wireless Institute of Australia exist in every State of the Commonwealth. The activities of these Divisions are co-ordinated by Federal Headquarters Division, the location of which is determined from time to time by ballot.

Present location of F.H.Q. :— New South Wales

Federal President : F. P. DICKSON, VK2AFB.

Vice-President : H. F. PETERSON, VK2HP. Federal Secretary : W. G. RYAN, VK2TI.

Councillors : C. FRYAR, VK2NP ; W. J. McELREA, VK2UV

Official Organ : "AMATEUR RADIO"—Published by the Victorian Division.

VICTORIAN DIVISION 191 QUEEN ST., MELBOURNE Postal Address : Box 2611W, G.P.O.

President : H. N. STEVENS, VK3JO

Secretary : R. A. C. ANDERSON, VK3WY

Treasurer : J. G. MARSLAND, VK3NY

Councillors : I. MORGAN, VK3DH; T. D. HOGAN, VK3HX; R. J. MARRIOTT, VK3SI; C. QUIN, VK3WQ; A. H. CLYNE, VK3VX; H. BURDEKIN; K. RIDGWAY.

Subscription Rates

Metropolitan	£1 per annum
Country	14/6 per annum
Defence Forces	7/6 per annum

Subscription includes "AMATEUR RADIO"

Meeting Night

First Tuesday in each month at W.I.A. Rooms,
191 Queen Street.

Visiting Overseas and Interstate Amateurs are welcome at meetings and they are invited to communicate with the Membership Secretaries :

T. D. HOGAN . . VK3HX - UM1732

J. G. MARSLAND VK3NY - WF3958

NEW SOUTH WALES DIVISION

Registered Office :

21 TUNSTALL AV., KINGSFORD

Telephone : FX3305

Postal Address : Box 1734JJ, G.P.O., Sydney

Meeting Place

Y.M.C.A. BUILDINGS, PITT ST., SYDNEY

President : R. A. PRIDDLE, VK2RA

Vice-Presidents : H. F. PETERSON, VK2HP ;
E. HODGKINS, VK2EH.

Secretary : W. G. RYAN, VK2TI

Treasurer : W. J. McELREA, VK2UV.

Councillors : N. GOUGH, VK2NG; E. TREHARNE,
VK2AFQ; P. DICKSON, VK2AFB; C. FRYAR, VK2NP;
R. MILLER

Subscription Rates

Full Members 10/6 per annum

Service Members 7/6 per annum

The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and an invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

WESTERN AUST. DIVISION

C.M.L. Buildings,

ST. GEORGE'S TERRACE, PERTH

Postal Address : BOX N1002, G.P.O. PERTH.

Secretary : C. QUIN, VK6CX.

QUEENSLAND DIVISION

Box 1524V, BRISBANE

SOUTH AUSTRALIAN DIVISION

Box 284D, ADELAIDE

TASMANIAN DIVISION

BOX 547E, HOBART

SIXPENCE

AUGUST 1944

AMATEUR RADIO

THE
OFFICIAL ORGAN
OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA



Published by the Victorian Division

AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol. 12 No. 8

August 1944.

FROM THE EDITOR'S PEN

Reading advertisements in overseas magazines of recent issue one gains the impression that at long last leading manufacturers have arrived at the conclusion that the Amateur has filled a very valuable place in the development of radio...not only in the past, but right at the present time when his experience is proving of the utmost value in the production of war equipment, not only in the production, but in the operation and maintenance of this equipment in the field.

To quote from the advertisement of Messrs. Eitel-McCullough Inc. manufacturers of the famous "Eimac" tubes, "The radio amateur is off the air as an Amateur, but he's still in radio. He's there in person and he's everywhere in the products created to satisfy his progressive demands. Many of the world's leading electronic engineers are Radio Amateurs, and much of the equipment in use today by the armed services is a product of the great Amateur testing grounds."

This coming from a firm with such a reputation as the advertiser is praise indeed and forces one to consider the lack of appreciation shown by Australian manufacturers for the work done by the Amateur.

With the Great Allied success on all fronts, together with the internal unrest in both Germany and Japan, there is a wave of optimism also in the Amateur world, for the sooner it is over the sooner the Amateur is back on the air.

The Wireless Institute of Australia, the officially recognised body representing licenced amateurs, is the source from which the move must come for the restoration of licences.

The strongest argument that the Institute can put up is that it represents 100% membership of all former and intending licencees.. This can only be achieved by existing Institute members doing their utmost to interest other Hams to become members. Remember the Institute has guarded your interests, and will continue to do so.

...oOo...

MAGNETIC RECORDING AGAIN

... Alec H. Glyne VK3VX ...

Before the advent of sound-on-film and long playing 33RPM discs the only satisfactory way to record a long program was by the magnetic process, in which sound was recorded in the form of variations in magnetisation along the length of a steel tape or wire. In recording, the tape is passed between the poles of a permanent magnet around which is wound a coil fed from the recording amplifier. The variations in field produced by the coil bring about a variation in degree of magnetisation of the tape.

Playback is effected by passing the tape through a similar device the coil being in this case connected to the input of an amplifier in the same manner as in the case of the familiar magnetic pick-up used on disc recordings.

Among the advantages claimed for this system of sound recording are that there is no scratch, disc to physical contact between the recording medium and the pick-up and similarly there is no wear on the recording medium. Neither of these advantages can be fully realised, for the steel tape cannot be made perfectly homogeneous throughout its length, small imperfections in the structure of the steel therefore produce noise and furthermore the repeated reeling and unreeling of the tape produces stresses in the steel which in time destroy the magnetisation. Sharp blows such as are caused by dropping a reel of tape also tend to destroy the recording.

However in the above respects magnetic recording is quite the equal of disc and film recording and indeed has one advantage that the others have not, namely, the recording may be completely wiped off the tape by passing it through a magnetic field sufficiently dense to saturate the steel, after which it may be used for a further recording and this process can be repeated indefinitely.

In regard to durability, magnetic recording is much superior to any other method, a magnetic record may be played thousands of times.

All this seems too good to be true, and, you say, there must be a catch somewhere. There is...the response of magnetic recording falls off badly below about 250 c/s and above 5000 c/s making it ideal for voice but quite unsuitable for musical recording.

Such a recorder has been in use at the P.M.G. Laboratories in Melbourne for many years and is still used for recording overseas broadcasts of speeches by the King and others for local

retransmission at times more suitable for local listeners. A half hour recording can be accommodated on a reel about three feet in diameter and half an inch in width.

Recently news has come to hand from America of a new application for magnetic recording.

Intelligence officers of the Army Navy and Air Forces found that observers in aircraft on reconnaissance missions were often unable to make written notes quickly enough when over their objectives and consequently valuable items of information were sometimes lost. So it seemed that some form of recording would be an advantage, the observers could then dictate their notes into their intercom microphones and would thus be able to perform their duties much more speedily and accurately.

Such a recorder would have to be light, self contained, compact and capable of making uninterrupted records covering longer periods than could be accomplished by disc recording. Furthermore the records would have to be available for playback immediately after landing, which precluded the use of sound-on-film with its inevitable delays for processing. So the old magnetic system was taken down off the shelf, dusted off and put into action.

This time the medium used is a fine steel wire of about 42swg passing through the recorder at 3 feet per second, and the standard length of wire is about 11500 feet, giving a running time of 66 minutes.

The wire can be accommodated on a reel about 4 inches diameter and half an inch wide and the whole recording apparatus is contained in a box about 12" x 6" x 4" with a total weight of 9 pounds.

The steel used has been specially developed for this application and a test recording made on it has been played 100,000 times without any perceptible change in quality. No details have been given of the frequency range but it is reasonable to assume that research has been conducted into the matter and the future possibilities in the application of magnetic recording appear to be very extensive.

The first use of the new recorder in action was when it was installed in a Flying Fortress on a bombing mission over France in daylight. The recorder was connected to the intercom system and it is said that the voices of the crew and the sounds of battle were very realistically recorded. No doubt the comments of the crew while in the thick of the flak would be most interesting.

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VICTORIAN DIVISION

... President's Report ...

Presented at

THE 34th ANNUAL GENERAL MEETING...1/8/1944.

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For the fourth successive year it is my pleasant duty to review at this, the 34th Annual General Meeting, the activities of this Division of the Wireless Institute of Australia during the past year. Probably the most important matter for review is that of finance, but as full details of this are shown in the Balance Sheet and Income and Expenditure Accounts, a copy of which will be posted to every member. I will deal but briefly with the most outstanding points. The years operations have resulted in a loss, which, after providing £32.5.0 for depreciation and including £11.7.5 loss on the publication of "Amateur Radio" amounted to £93.16.1. This loss is slightly higher than that incurred last year, but your council holds the opinion that such losses must be expected whilst the war continues, and that, if necessary, our reserve funds should be used to ensure permanency of these rooms.

Five audio oscillators which were built for the use of the morse classes have been sold for a total of £31.14.0 reducing the capital value of apparatus by that amount. By the investment of £50.0.0 during the last war loan our holding of Commonwealth Government Inscribed Stock has been increased by that amount to £550.

In view of the continual losses shown by the balance sheets of recent years, it is, I think, a matter of great satisfaction that, after nearly five years of war, our reserve funds have not suffered greater depletion.

MEMBERSHIP... I am pleased to be able to report that membership figures again show a remarkable increase, partly due to the work of the Membership Secretaries Messrs. T. D. Hogan VK3HX and J. G. Marsland VK3NY. Commencing the year with 148 members, 71 members either joined or re-joined; 14 members re-joining as a result of the membership drive conducted during May and June, 11 members failed to renew subscriptions from the previous year, resulting in a nett increase of 60 members and making the total at the 30th June...208.

Of this number 100 are members of the defence forces, the following seven having been reported "Prisoner of War" or "Missing", Major Lyle Andrews VK3HY; Sgnt. M. R. Campbell VK3MR; Pte Jack McCandlish VK3HM; Sgt. K. Oliver VK3GZ; Flying Officer Roy Prowse VK3XS; Flying Officer Arthur Tinkler VK3ZV and Lieutenant Gordon Weynton VK3XU. May I express the hope that all these and any other HAMS who

may be similarly placed at present will be returned to their homes, free once more to send their calls far and wide.

In extending to all new members a warm welcome and an invitation to take an active part in all Institute activities, I would like to express gratification at the rising membership figures and the view that it is an indication of a wider realisation that the Wireless Institute of Australia is destined to play an important part in the restoration of licences and other post war activities. So far the membership drive has touched only old members who have for reasons best known to themselves, omitted to renew their subscriptions at some time or another during the past five or six years. In making a determined effort to rectify these omissions, the membership secretaries have posted circulars and current issues of the magazine to about 140 old members. I have already told you of the immediate result and I think it's not too much to hope that a response will come from many others in the near future. The next on the list for attention of the Membership Secretaries is the non-members, so that I think we can look for an even more remarkable increase in membership during the coming year. Any member new or old who has not yet received a membership certificate should enquire about it immediately.

MAGAZINE.... Consequent upon the increased membership, circulation of Amateur Radio has continued to improve, being now past the 400 mark, but, due to the loss of our advertising support during the year, publication resulted in a loss of £11.7.5d. The members of the Magazine Committee continue to devote two Saturday afternoons per month to the work of producing the magazine, and the Division is indebted to them for the way in which they carry out their task.

No mention of the magazine, however, would be complete without a word of praise for those good people who have contributed articles for publication. Although it has been necessary to use articles abstracted from overseas publications, whatever their origin, they have always maintained a high technical standard and made interesting reading.

An innovation during the year was the boom review page by Mr. A. H. Clyne VK3VX, which I feel sure has been of inestimable value to Hams who are unable to see for themselves just what books are available.

The arrangement with the New South Wales Division, which provides for a 14 Page magazine incorporating their Divisional Bulletin, has worked very well, and the present degree of co-operation between the two Divisions can be expected to continue to their mutual benefit. The present size of the magazine is governed partly by paper rationing and partly by the facilities available at present for printing, but the Magazine Committee hopes that the

return to a printed magazine is not far distant, plans for a change over as soon as circumstances permit having already been considered.

EMERGENCY COMMUNICATIONS....On the flimsy pretext that installation of power points and aerials would be too costly, our offer to provide emergency communications for country police stations was refused. As it was plain that our services were just not wanted, we did not press further in this direction, but, when early this year bush fires ravaged parts of the State, our services and equipment were offered to the Forests Commission. This offer was not availed of and, when shortly after the disastrous grass fire occurred. Hams in the Western District were so able to impress members of the Bush Fire Brigades Association with the possibilities of Radio Communication, that we were requested to submit a scheme and an estimate of costs to a meeting held in Melbourne. Much time has been put into this work by Messrs. T. D. Hogan and J. K. Ridgway, and the scheme submitted provides for a network of fixed, mobile and portable stations that would enable rapid communication to be maintained between fire fighters and control officers in all parts of the State where fire fighting is in the care of the Bush Fire Brigades Association.

In estimating the cost of the parts needed to make the 104 stations required at £3000, no allowance was made for any payments for the services of any one who may be helping to construct and/or operate the gear. Apart from the initial work of constructing the gear, our main part in the scheme will be to see that it is kept in good working order and to provide operators for each zone control station, in fact the Division are to act as Technical and Communication Officers. Full details are beyond the scope of this review, but I can say that it has received the support of a large gathering representing both city and country Hams. Messrs. Hogan and Ridgway personally submitted the scheme to a Bush Fire Brigade's Association Executive Meeting, and later a demonstration of how the scheme would handle traffic was given at Hamilton by a group of Western Zone Hams. Both meetings appeared to be favorably impressed and we were confident that it would be accepted without delay. We were, therefore, rather surprised that no finality has yet been reached in spite of continuous contact with the Association, and we now assume that they are awaiting the passage of legislature in the present session of State Parliament, whereby a State Fire Authority is to be established.

LABORATORY.... A Committee, members of which are Messrs. I. Morgan VK3DH; A. H. Clyne VK3VX; G. C. Quin VK3WQ; J. K. Ridgway and myself has been meeting at least twice each month for the purpose of investigating the laboratory equipment with a view to setting up the apparatus, so that full use could be made of it. After prolonged and careful investigation, however, the Committee has reported to Council that, whilst the B. F. O. Wheatstone Bridge; and Capacity Bridge; Precision Condenser; and 1000 cycle Oscillator are in excellent condition and their calibration accurate, they possess certain

inherent qualities which render them of very limited servicability; to the demands of a modern laboratory, and the Committee has recommended the sale of these items, except for the BFO which it is thought will be difficult to sell dur to its unsuitability for modern requirements. The proceeds from the sales to be paid into a fund to provide for the purchase of suitable equipment at a later date.

The Committee has further suggested that the ultimate necessities of the Laboratory should include:- 1. B.F.O. or other suitable instrument with a range of from 20 to 15,000 cycles per second. 2. Precision Signal Generator. 3. Inductance, Capacity and Resistance Bridge, 4. Vacuum Tube Voltmeter. 5. Cathode Ray Oscilloscope. 6. Hetrodyne Frequency Meter. 7. Means of testing tubes, transmitting and receiving. 8. Such measuring equipment as may be deemed necessary by post war developments in Amateur radio as yet unforeseen.

A laboratory so equipped would provide facilities for making comprehensive tests of members gear and equipment and would be a big help in ensuring that the more exacting requirements of post war amateur radio would be met. However, it is a goal which will not be easily reached as the equipment is expensive and it may be some time after the war before any of it becomes available.

Some of the Admiralty Handbooks used by the AACP classes have been sold and we are anxious to dispose of more as receipts from the sale of these books provides a fund to be used for the purchase of modern books for the Technical Library.

In conclusion, I would like to thank all members of Council for their co-operation during the year. All I need say is that it has been a great pleasure to have had them working with me.

H. N. Stevens, VK3JO.
President.

.....

CORRESPONDENCE

L.H.S. Hy Wireless Group,
Albert Park.

To President and Councillors,
Victorian Division W.I.A.

Dear Sirs, Re clause 3, page 11 of June Amateur Radio.

We the undersigned emphatically oppose the idea. Our main reasons being:- Although proficient operators, Army men are not required to possess much technical knowledge.

Most CO's are administrators and may not fully understand the standard expected for the AACP. If a man possess knowledge equal or superior to AACP standard, he could pass the exam without inconvenience.

K.V. Scott VK3SS. A.R. Williams VK3WE.
J.L. Duncan VK3VZ Ralph L. Day VK3RD.
R. McGregor VK3XZ.

SLOUCH HATS and FORAGE CAPS

Believe it or not, a laddie rang me up the other night and said how he appreciated reading all your doings in this column of ours. He had been fifteen months or so out in the North West and our Mag. and our Colum was his only means of keeping in touch with where all the VK hams were and what was happening at Divisional Headquarters. So its as I said...if YOU like to know where some other Ham is and what he is doing, there MUST be another Ham or two who have been wondering what the H... became of old VK!!! ... haven't heard of him for years....SO, send in THOSE NOTES.

Petty Officer Sid Clark sent me some notes from Milne Bay, but before they could be published he arrived down in person...for a brief rest, so he said. However, by the time you read this he will once more be where they don't need Kosi stoves in Winter time...Oh no, not that place YET.....I mean Milne Bay. Hi!

Graham Colley VK3QZ after attaining the rank of P/O was sent up North and nothing had been heard from him until recently when news of his exploits have come to hand. We suspect that his job was strictly hush-hush and full details are not available. From what we can gather he went into New Britain with the first invasion troops and was there for quite a while. We believe he established and operated an advance???? station under heavy Nip strafing. He was cut off from all services and comforts for a long while. That he was successful goes without saying for there is evidence of a fine letter from a high ranking American Officer written to Graham's wife congratulating her on the fine work her husband was doing and also on her fine cooking...it seems he shared one of her cakes. After that Graham was in the Admiralties for a time and at the end of May he was back in the New Guinea mainland ahead of our front line in Nip territory where, he says, "we had to watch our steps pretty carefully."

VK4TK Lac Robert P. Stack reports being back in Aussie after eighteen months in New Guinea. Would prefer to see the spots he has been in from the deck of the Bulolo, though. He met quite a few hams during that time but the calls have mostly slipped his memory. He asks if any of the chaps has news of Beulah B. Tolonen, one time of Phoenix Arizona, call sign W6OPV and also K7GLL, when she was in Alaska. Last time 4TK heard of her she was in La Paz Bolivia. As she worked many of the VKs possibly somebody may have heard of her. Regards to 4HA, 2YL, 6GC and his daughter, 4HN (Nick of Port Moresby) and 9VG of Bulolo from 4 TK Bunda St., East Innosfail.

Don B. Knock VK2NE Inspector Engineer and Signal Stores (Vic) is now a Major...fb Don cm...now for the "florid complexion and a liver that needs dry cleaning" which is the official requirements, I believe Don says he believes they have heard some FB long distance DX way down on the VHF, but that wouldn't surprise any Ham as he says would know about the "Sporadic E Layer DX". 2N0 also reports that 2ZH of whom nothing has been heard of since the War now holds a Commission in the R.A.A.F....thanks Don, its first news of him...like "first QSOs. HI!

VK2QL Frank Hine whom very many of you will remember rang up the other night. Frank is now a Fl/Lt and after his service around New Guinea is for the time stationed at Wagga. Alec Slight VK2ZA is back after his trip to G and in the North West. 2ZA, 2QL and P/o Bill Lewis 2YB (last heard of at Sale) were in permanent R.A.A.F. at Richmond before the War.

Fl/Lt R. J. Reynolds VK2AFR sends us a note on the back of his Sub Form...quite a good idea more chaps could follow...says he has just returned from a tour of Service units Northern and New Guinea...naturally he met Hams...so many he says he couldn't sort them out without getting down to the job in earnest. HI!

Sargeant Alan Jocelyn 2AJ0 is now located at Bonegilla..."repairing the ravages of women" (so my correspondent says)...and wishes to be remembered to all the Zero-beaters.

Wilf Harriss...Petty Officer H.M.A.S. Australia...VK2ALF...puts over the best yet...says he will pay his Sub when the ship reaches port...Wilf, I hand it to you for originality...2YC. Wilf was over in the Med when the Greece Crete affair was on and finds the Jap air raids not too bad after the chasing of divebombers etc. H.M.A.S Perth gave over there.

Some time ago, Sgt. Keith Scott VK3SS got himself tangled up in 3000 volts & except for a burn or two he survived. The gang at LHQ heavy Wireless now view Keith very suspiciously for the reason that he recently returned from a visit to the city badly cut about...and ...his excuse was..."he fell over"???

Lt. Joe Ackerman VK2ALG has just finished his "spot of leave" and once more heads north to play round with the "ducks and alligators etc. etc." with which he now consorts. He says 31A who did a course with him is now at Darwin, and John Clio 2OZ is once more on the move also, "ALG mention that ZLIAQ in a W/O in the Air Force. He was in the Army first but has now joined the Air Force as an instructor. The Loot also mentioned 2RF as being in the Instructional Corp...I remember Bill as the VK2 WIA Div. Sec. longer years ago than I care to remember. HI!

Sig. J.F. Spain, well known in prewar days as 2nd op at 3HX writes that recently he received a copy of "AR" the first he has seen for a long time...so you see we get places OUR MAG...2YC...The old

FEDERAL HEADQUARTERS

Well the Essay Competition has concluded and all entries read and re-read by the judges, who were Messrs. F. P. Dickson VK2AFB, R. Priddle VK2RA and W. Ryan VK2TI, in an endeavor to ascertain what form Post War Amateur Radio would take. In deciding to hold this competition the Federal Executive were more concerned in obtaining the views of Australian Amateurs rather than a literary effort worthy of the Pulitzer Prize. It was very interesting to note that quite a few competitors, I really think the correct term should be entrants, based their headings on those suggested as suitable topics by Federal Executive when the event was first mooted.

Quite frankly the number of entries received was rather disappointing, particularly as Federal Headquarters had in mind the possibility of framing a Post War Policy from the views expressed in the various essays, but, nevertheless, what was lacking in quantity was made up in quality. Many chaps did not feel like writing a thesis on the subject but had one or two ideas they felt like expressing and it is to their credit that they did not hesitate to do it.

As you are aware the original conditions laid down that three prizes would be awarded and the judges in making the awards decided that one should be set aside for a Service entrant whilst the other two would go to non-Service entries.

Well, here is the result. The non-Service prizes were won by:-

E. Hodgkins VK2EH
J. Ballinger VK3MK

and the Service Prize by:-

Petty Officer Telegraphist, S. Clark.

Reviewing the Essays it would appear that every entrant is in favor of an Australian Wireless Institute with a permanent staff rather than an Institute as at present constituted with Divisions in each State more or less dependant upon the voluntary efforts of the "always faithful few." An Australian Institute is one strongly favored by the Judges and the other members of Federal Headquarters. They also feel that the magazine should not be the responsibility of any one State. Quite frankly, when the entries had been whittled down, another an entry by J. Marsland 3NY received quite a deal of consideration, and the Judges were of the opinion that quite a deal of thought had been given by 3NY to the subject but felt that in the latter part his essay his viewpoint had considerably narrowed, and he was discussing the matter purely from a State angle rather than an Australian outlook.

The question of power did not receive a great variety of desire. Most entrants being satisfied with 100 watts with one notable exception who asked 500 watts for DX and 175 watts for local Qso's!

It is not proposed to debate the pros and cons of the winning Essays at this stage as they will be published each month, but eventually the good points of all essays will be collated and published.

POST-WAR AMATEUR RADIO

.. Ernest P. Hodgkins ... VK2EH ..

Post War Amateur Radio. - What a wealth of meaning those few words have for the amateur operator and experimenter! - What visions they conjour up! - What a pleasant thrill the contemplation of QSO's again gives! - How good it is going to be to once more operate the rig, and that brand new receiver - with its row of tubes and latest idea in dials; to collect those much sought after QSL's; to meet old friends of the air again; to share in the good fellowship that exists between Hams the world over.

But Post War Amateur Radio is not yet an established fact. Quite a lot of water must flow under the proverbial "Bridge" before the desire to participate once again may be gratified. We have not yet received the "all clear" from the Powers That Be.

What attitude will they adopt towards us when we do approach them? What convincing information must we as Amateurs present in support of our case, and who will present it for us? How many Hams will their voice represent? What other opposition is there likely to be? What steps are we as Amateurs going to take to meet these circumstances?

Our case may need to be a strong one. We may have to present very convincing proof of our good use of the frequencies allotted to us in the past. There will surely be those who covet them. There always has been. Right from the "Bad Old Days," the Ham has been squeezed first from one band to another, and then again to one still lower down - so we may expect an attempt at further squeezing. There is a limit to the amount of squeezing that is possible too.

How many of us are going to have a say against this? The more the merrier. Not as individual Hams--Oh dear no--but as one properly constituted and organised body. A body whose voice has been heard before. One that is able to speak convincingly on our behalf. A voice representing every Ham in the Commonwealth. Yes, Brother Hams, let us have a Voice and let that voice speak in unison and as strongly and forcibly as possible.

To achieve the necessary unity and strength it is important that every Ham and every aspirant for the mysteries and privileges of Post-War Amateur Radio Operation, should be a member of the Wireless Institute of Australia. Now, as at present constituted the Wireless Institute of Australia does not completely and adequately fill the needs of a large body of Hams. This is because the meetings take place in the capitol cities. Most fellows belonging to our organisation like to feel that they are sharing in what is going on. Outlying districts are not sufficiently catered for. To overcome this deficiency I suggest that wherever possible Branch Clubs of the Wireless Institute of Australia, working under a Charter and

Constitution drawn up by Federal Council be formed. These Branches would take the place of the pre-war Radio Clubs and would function to fill the needs of Organised Amateur Radio just as the Branches of other Organisations and Societies function to fill the needs of all the members of the particular institution. There are no insurmountable difficulties. The Wireless Institute of Australia would then be the only body representing Amateurs in the country, thus indicating unity of purpose and control; giving us one powerful voice. The Branches would be in contact with Headquarters in each State by direct representative or by mail; Headquarters in each Division would be in touch with Federal Headquarters as now and through the Federal Body with the Authority Controlling Wireless Telegraphy. Thus we would have a strong voice emanating from a powerful Amateur Body.

When this is brought about it will be imperative that the Federal Body have at least a full time Secretary. It is necessary even now. The volume of work to be done and its importance warrant it.

In view of the number of licences issued in New South Wales and the amount of work entailed in running the business of the Institute, it would be desirable to have a paid secretary of this Division also. The more one comes in contact with the business handled by the Honorary Secretary of the New South Wales Division the greater appreciation one has for the efforts put into the job on Amateur Radio's behalf. With the present membership it is a mansized job - and with the return of Amateur Radio and the increased membership that will result, it will cease to be a voluntary part-time job, but will demand the attention of someone permanently, who should receive an honorarium as compensation for the time and effort put into the work.

Who knows, we may even reach the stage when the President and Councillors may also receive a small honorarium. This may inspire others to submit for ballot, so making it necessary for Councillors to be more enthusiastic, (if that is possible) than they are now, and so earn what they receive either appreciation or criticism. It would also give some members justifiable grounds for complaint if councillors were not doing the fine job that was expected of them. Hi?

With regard to the conditions under which we desire to operate our Post War Amateur Radio, and the case for our return to the "air" again, it is most desirable that we make it as easy for the "Authorities" to say "YES" as it is possible. We must remember that Amateur Radio does not only concern W.I.A. Members, or Australian Amateurs only, but that is the concern of many oversea Governments as well. It would be a wise move to approach "Officialdom" with NO new suggestions (YET). Let us ask for the "all clear" under conditions that appertained before we received the red telegram saying "stop." We found those conditions very fair. Our frequency bands were good,

80 metres for Emergency Portable and search and rescue work...40 metres for some DX and regular consistent working...20 and 10 metres for DX and 5 metres for experimenting with HF gear and antennae. The higher frequencies will most certainly be ear-marked for further development of some of the hush-hush work already done...for television...location...light house work and so on.

The 50 watt limit was quite good workable one Technicians tell us that the power must be increased ten times to make one "R" point change in reception at distance. Half a kilowatt would cause QRM and isn't democratic anyway. Let us ask for 50 watts again and be content.

Just give Amateurs an opportunity of putting into practice some of the ideas they have had in mind during the past four years and there will be some very fine postwar amateur station installations. Most of us, though, will be obliged, for a while anyway, to revamp the gear that was "frozen" in 1939. It won't be long before some of the lads will warm some of it up too. I recall the plates of some finals I have seen with a "ruddy Blush". We may expect developments such as variable frequency control, better and more test equipment such as signal tracers, more efficient antenna installations and vastly improved receiver response. This latter is a better move than increasing the input to the final to half a kilowatt.

Some of the lads at present in the various services will come forward with some bright ideas from some of the hush-hush gear, many new ideas will find their way into amateur installations (to say nothing of some of the gear itself).

These same lads have acquired a definite knowledge and skill in the handling of gear of great value to their country. It would be a definite loss if it were allowed to lapse and become defunct. The "United Nations" cause has suffered in the past because of our unpreparedness and lack of equipment. From this point of view, the services which trained these lads should provide opportunity for regular and useful practice in the branches in which they have given training, thus building up a permanent reserve trained and equipped, so that we may be able to meet an emergency should it occur. We surely hope that it will not.

Once the present conflict is over, and we have Amateur Radio once more, let us hope that never again will we have the Radio "Black Out" which all amateurs find so irksome. Post War Amateur Radio will be the grand hobby that Amateur Radio used to be. We will make new radio friends and meet all the old ones, and pass on to all the friendly, fraternal greetings as of old. Each QSO will finish with QRM Hr nw OM.

.....0000.....

Mag brought back many memories to Jack who is at present "enjoying" Army life in N.G. after seeing very much of VK. About 12 months ago he got into Sigs and was lucky enough to go to an Army School of sigs in Sydney, and during a leave he decided to get married. Now he is in charge of a battery charging station as well as looking "after" signal stores. (Bet you he has a good Rx after the War, lads ...2YC).

Morrie Lusby 2WM has returned to VK after 2½ years absence in U.S.A. and England. Morrie gave about three quarters of an hour's talk at the W.I.A. meeting in which he showed what he has assimilated from the Diplomatic Corp. He MAY have just been on a tour sightseeing. Hi! Reckons he has done about 50,000 miles by air crossing the both oceans the Pacific taking 35 hours, and that isn't too bad for a civilian, in wartime. What a priority he must have had. Hi; Incidentally he left England when the BIG BAN was on, which bears out the last remark, what.

And so ends S & H. for this month. Send all notes to your Divisional Secretary or to 2YC, 78 Maloney St., Eastlakes, Mascot, Phone MU1092.

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VICTORIAN DIVISION.

The Annual General Meeting of the Division last Tuesday night, August 1st, saw an invasion of Service Hams mostly from inter-state. As space in this issue is rather limited, a full report will be included in the next issue.

The election of Officers for the ensuing year resulted in a double ballot for the Presidency. Messrs. H. N. Stevens VK3JO, I. Morgan VK3DH and J. G. Marsland VK3NY were nominated. In the voting Mr. Stevens and Mr. Marsland tied, and in the final vote Mr. Stevens was re-elected.

Vice-Presidents appointed were Messrs. T. D. Hogan VK3HX, M. Howden VK3BQ and H. Kinnear VK3KN.

Council elected for the next twelve months were:- Messrs. I. Morgan VK3DH; C. C. Quin VK3WQ; A. H. Clyne VK3VX; R. Marriott VK3SI; H. N. Stevens VK3JO; T. D. Hogan VK3HX; J. K. Ridgway and H. Burdekin.

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The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and an invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

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SEPTEMBER 1944

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POST WAR AMATEUR RADIO

-- By J. W. Ballinger. VK3NK --

Seeing the request for entries for the "Essay" on Post War Amateur Radio, especially from VK3 members, I will try to the best of my ability to express my views on this all important subject. Firstly, the important question of whether W.I.A. should have permanent staff or not - definitely I think that there should be a permanent staff on lines similar to the A.R.R.L., although not quite so elaborate, but with a good technical staff to help amateurs as occasion arises and to improve the technical articles in "Amateur Radio." Also a good secretarial staff to handle the correspondence that will greatly increase after the war as more and more amateurs join W.I.A. On the question of frequencies I think that the lowest frequency band (200 meter phone band) should be omitted and more use made of the 28.000 & 56.000kc/s bands. There should also be a section of the 3.500, 7.000, & 14,000 kc/s bands allotted to phone transmitters and a section of these bands allotted to CW transmitters, so as to reduce QRM etc. More field days should be organised by the different sections in each state, especially for 28.000 & 56.000 kc/s communication and experimental work.

On the subject of power I think that an increase from the present 25 watts to 50 watts should be granted by the P.M.G. and after a certain period if the operator has not caused any interference to broadcast listeners and has efficiently shown that he is capable of using high power, his division of the W.I.A. should have the power to grant him a further increase in power up to 100 watts. I also think that all transmitters should be crystal controlled and a monitoring post established by permanent staff of W.I.A. to keep a check on the quality of signals transmitted by the different amateur stations.

I also think that every amateur should be a full member of the W.I.A. and help make it a bigger and better organisation. It is for the good of every amateur station to have a good representative body at the head of amateur radio in this country. I think that when the new call lists come out at different periods during the year the W.I.A. should put their pamphlet "Organisation and advantages of membership," before all the new amateurs and try and get their help

in getting amateur radio on a sound footing in Australia. I definitely think that the P.M.G. should invest in the W.I.A. a larger degree of control over amateur radio than has been given in the past. I also think that the Service and Civilian Defence Reserves should be organised and maintained by means of a government subsidy. My ideas of the post war Amateur Radio Station are that the station be crystal controlled with a power of up to 50 watts, and capable of operating on all the frequencies allotted to Amateur Radio, also that the station have a very efficient method of monitoring and checking of frequency, the receiver be a superhet. A directional antenna system would also be a great asset. I think that amateurs should also be given the same privileges as in pre-war days, except that they be granted an increase in power from 25 watts to 50 watts, and permission to carry out television experiments if they so desire. Another very important matter I think the W.I.A. could help in would be in the organisation of a communications system in the fire areas, living in the area of the disastrous grass fire which wiped out the township of Derrinallum and miles of country around the district, I know from first-hand information what a terrible job it was to get any news through as all phone wires were down and the only means of communication was by a car necessitating a journey of from 30 to 50 miles or more, whereas if the amateurs of this district were organised they could handle the emergency traffic and help the bush fire fighters to get a better idea of how the fire is going.

Re the Institute's Magazine "Amateur Radio," I think that it could be improved in a number of ways. The technical articles could be made larger and cover more fields of the technical side of amateur radio. A DX column on the same lines as the "How's DX" column of Q.S.T. would also, I feel sure, be very much appreciated by the members who are interested in the DX side of amateur radio. Also the different section notes in each of the divisions could be improved by the W.I.A. offering a small annual prize to the station that is most consistent in sending in it's monthly report - a correspondence section whereby amateurs could air their views on matters of interest, grouches, etc.

Amateur radio clubs in the areas where there are a number of amateurs would be a benefit to the promotion of amateur radio. In the matter of competitions, I think there should be at least one for the amateurs out where there are no AC mains, and they have to reply on "B" Batts or vibrator unit for power. The real low power amateurs do not have much chance against the high power amateurs, I think something should be done for the low power chaps in the way of a low power competition. I think that the international contests should still be held as they always create a great deal of interest in the world of amateur radio - I think the competitive spirit should be fostered. The Q.S.L. Bureau should be continued in each of the divisions as it was such a great success in pre-war amateur days.

A "UTILITY" VALVE VOLTMETER

The instrument to be described makes no pretence to displace the more conventional valve voltmeter employing a sensitive moving coil movement (probably in the micro-ampere range), nor does it claim a very high standard of accuracy. Rather has it been designed as a "utility" instrument requiring, for its construction only components which the average amateur is already likely to possess. At the same time its sensitivity is quite high, full scale deflection being 3 volts. The meter used has a 5 milliamperé moving coil movement and partly by virtue of the robustness of the movement and partly because of the DC amplifier valve it is practically impossible to damage the instrument by overloading.

The arrangement employs a DC amplifier following a grid-leak detector and due to the phase reverse which takes place between the detector and the amplifier, the meter scale reads from left to right.

The action seems to be as follows:- After preliminary heating up, the potentiometer R1 is adjusted until the meter indicates zero on the dial. This is an arbitrary point but obviously as far to the left as possible so that the maximum length of scale is available for calibration. The voltage to be measured is now applied across AB. The positive pulses transferred to the grid of V1 by way of C1 cause a PD to be developed across the grid leak R2 which biases the grid negatively and so reduces the anode current. This reduces the voltage drop over R3 with the result that the potential at the point P rises. This reduces the bias on the grid of V2 by way of R4 with the result that an increase in anode current takes place in V2 which is indicated on the meter.

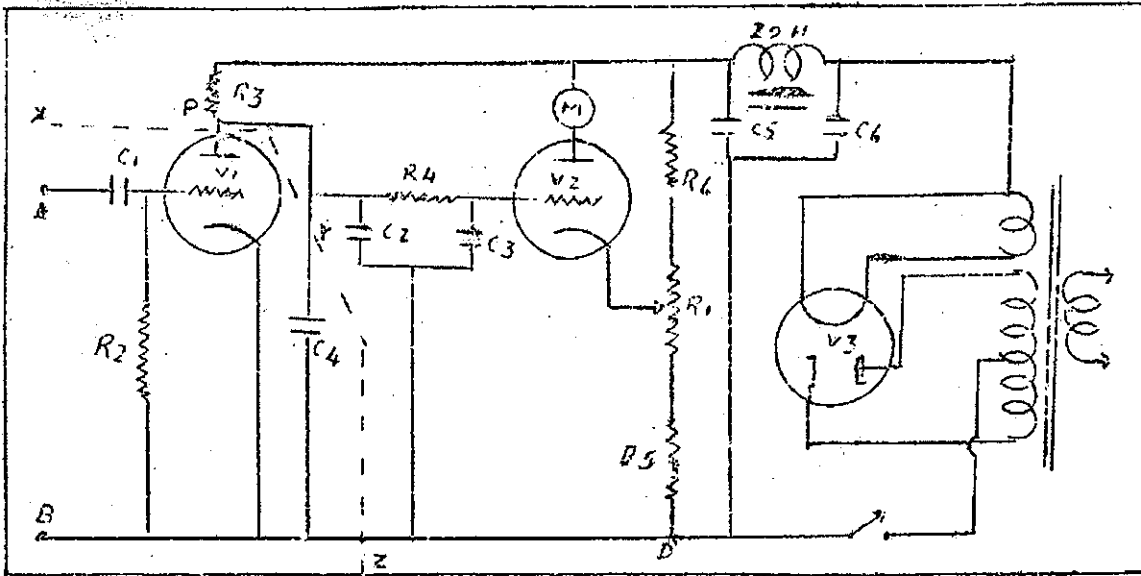
R4, C2, and C3 form a filter system which smooths out the pulsating DC and prevents excessive vibration of the needle. The time constant of this filter combination can be varied to provide any degree of damping for the movement, which may be desired.

The components within the area bounded by the dotted line XYZ constitute the detector unit which is separate and detachable. The valve is an RF pentode connected as a triode. The idea is to use a tube having a top grid connection. The tube is surmounted by a shield which earths to the metallising of the valve, and inside this shield are the grid leak and condenser. The terminal A is mounted in the centre of a disc of polystyrene or other suitable insulation covering the end of the shield.

For audio and lower frequencies this unit can be plugged straight into the main unit. For measurement of higher frequencies however, a flexible extension has been made. One end of this is equipped with a male 7 pin plug, while the other terminated in a valve holder into which the detector unit can be plugged, the other end

of the extension being inserted in the socket from which the valve has been withdrawn. The terminal A can now be brought right up to the position where measurements are required. The extension carries the heater and power supplies and a by-pass condenser C4.

The resistors which form the voltage divider across the HT need to be of ample rating as the whole of the current for the amplifier stage plus the bleeder current must be carried.



- R1.....10,000 ohms
- R2.....10 megohm
- R3.....0.25 "
- R4.....2 megohm
- R5.....5000 ohms
- R6.....60,000 ohms

- C1.....0.01 mfd
- C2,3...0.1 mfd
- C40.001 mfd
- C5,6...4 mfd
- V1.....6X4 pen B
- V2.....MH4

CALIBRATION.. Owing to the high value of grid leak and comparatively large capacity of grid condenser, the reading approximates very closely to the peak value. If, therefore, the instrument is likely to be used to measure complex or peaky waveforms, this fact must be remembered if calibration is carried out at 50 c/s AC (RMS)

For this instrument the zero was chosen at a value of plate current of only a few microamperes above cut-off, where the characteristic is not by any means straight, with the result that the adjustment of this point at each time of use is rather a ticklish job. It would have been better to have chosen a value of one or two milliamps where the characteristic is straight. It will be found that the calibration is logarithmic in character so that the

scale is more open at low readings--a distinct advantage.

PERFORMANCE. After allowing a warming up period of about 15 minutes, the meter remains fairly stable and an accuracy of 2 or 3 per cent can be expected if readings are made as required. If however, the meter is connected in circuit for long periods, the chief limitation of most DC amplifiers makes itself apparent. This is due to the very great difference between the static (no reading) and deflected conditions in the meter circuit. Under this latter condition of use an error of over 5 percent had been noted. If, however, the zero is reset by adjustment of R1 as required, the performance satisfies most requirements.

No serious attempt had been made to extend the range of the instrument except by an input potential divider made up of a chain of high resistance leaks.

The instrument has been used in making measurements on gramophone pick-ups at frequencies between 8 Kc/ s and 25 c/s and its low range has made it very useful in this connection. It has also been used to measure induced voltages across resonant circuits up to as high a frequency as 14 Mc/s and although it begins to load the circuit somewhat at this frequency, it has very little effect on, say, the oscillator of a broadcast superhet.

From R.S.G.B. Bulletin.

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LUMINESCENT MATERIALS

Development of new and highly efficient luminescent materials by scientists in RCA Laboratories gives promise of opening of new fields of activities in the post war era, according to an article by H. W. Leverenz.

He points out that phosphors are unique in being able to convert electric power into white or colored light more efficiently than by any other known practical means. Also they can store light for controllable time intervals from less than one hundred thousandth of a second to more than twenty-four hours, and can instantaneously transform invisible radiations such as cathode or ultra-violet rays, into visible light.

Possible uses for phosphors are stated to include intense light sources for sound recording and theatre projection, inexpensive illumination of workplaces and homes by using phosphor crystals in fluorescent lamps, luminescent plastics to make night time safer and more colourful, and phosphors emitting specific radiations for controlled treatment of living tissues and organisms.

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AMATEUR TEST EQUIPMENT REQUIREMENTS

By

Charles C. Quin..VK3WQ

....

It seems that in post war Amateur Radio the Ham will have to justify his existence as a Ham to the full extent of his Licence. By this is meant that an AOCIP is granted for the express purpose of "carrying out experiments in wireless transmission."

In the past, many of us - now please don't take offence - were in Ham Radio mainly for the purpose of one or two reasons. Firstly the class that may be called DX fiends; who put so much time into the search for that elusive Dx that all thought of experimental radio was put into the background. Secondly were those chaps who had to entertain the BCL's.

Now I don't want to start a commotion amongst readers who may think that this article is written to 'pick' on to the abovementioned classes of Ham, and I am not writing this with the express intention of causing a special section to be started in this Magazine to discuss the subject. Suffice to say that you take it as read and chew it over, keeping in mind what is mentioned in the first paragraph.--- Having got that off my chest -- to continue.

Whenever a new rig or receiver was contemplated, it was usually promoted by an article in Amateur Radio or some other magazine devoted to radio. A frantic search through the junk box or old discarded equipment brought to light most of the necessary components and the balance was purchased from your favourite radio store and the apparatus was then put together and tested.

On the other hand however, you may have been more experimentally minded and 'doped' out your own circuits, and methods of construction. A search of radio stores for parts then followed to obtain the required standard of accuracy within a certain percentage.

It is intended to give over a period a short review of test apparatus of a nature which the average Ham can afford and which will give the required results. This article deals with the first piece of essential equipment, and it is intended to give a talk and demonstration as each article appears in Amateur Radio for that particular month. These talks will be given each month at the Victorian Division meeting, and anyone unable to attend the meetings and is interested in the subject are invited to contact "A.R."

With the trend to the use of higher frequencies much more accuracy of values is necessary in order to obtain the required results.

A means of measuring these parts will then be apparent and a bridge of some sort to check up the components to be used is found necessary. The following is a suggested bridge to suit the limited means of most hams. The bridge has already been written up in this magazine for May 1941.

Whilst no claims are made for EXTREME accuracy within a certain percentage it is quite accurate enough to show if a condenser is .01 or .099 or .11

This bridge can also be used to indicate the power or loss factor of condensers on the higher capacities which can be read directly by means of the 2500 ohm potentiometer in series with the 1 mfd standard.

To check up on the lower capacities the amount of "fuzzy" indicated by the 'Ego' will indicate the state of the condenser or resistor.

A worth-while addition to this bridge is the neon tube leak indicator, which by its frequency of flash indicates the condition of the condenser. A good condenser will only flash on application of voltage, whilst a poor one will flash at short intervals.

Naturally good standards are absolutely necessary, and also good quality switches for changing from one standard to another. Good regulation from the power supply is also necessary for the best results, and if possible a voltage regulator tube should be used.

When building up this bridge, care must be exercised to keep the grid of the eye away from all other leads or false readings will result. A good feature is that the "cold" side of the bridge need not be earthed or on the other hand, any components under test need not be entirely disconnected from any apparatus being checked--it being only necessary to ensure that the "hot" side of the bridge to be connected to the free end of the component under test...this is providing the apparatus is not earthed or connected to the light mains.

Resistors from 10 ohms to 30 megohms and condensers from 10 mmfd to 30 mfd can be checked with an accuracy of between 1 and 5 per cent throughout the whole range.

Operation is the same as tuning a signal to zero beat..i.e. when the eye is fully open the value of the component under test is then read off the calibrated scale. It will also be noticed even on the extreme ranges of both capacity and resistance the eye will open or close over "resonance" and the effect will be noticed as the slider goes over each turn of wire on the resistance strip of the potentiometer. Quoting this points out that a good quality potentiometer is essential.

This article together with a circuit will be continued in next months issue.

THE TECHNICAL LIBRARY

THE TECHNIQUE OF RADIO DESIGN .. E. E. Zepler (Lond. 1943)
311 pages .. 35/-

RADIO RECEIVER DESIGN...K. R. Sturley. Part 1 R.F. Amplification
and Detection (Lond. 1943) 435 p.---48/6.

These books are grouped together in this review for several reasons...they cover the same ground, are both by Marconi engineers, both appeared at the same time and they are both in the top line of radio manuals. The only difference of any importance is that Sturley deals with his subject more fully than does his colleague.

There has been, until the appearance of these two books a total lack of any work devoted entirely to receiver design, but that position has been well and truly remedied.

The following is a summary of the chapter headings in Zepler's book and although the chapter headings in the other book are not the same, the material is substantially the same. Symbols, Useful Formulae, Fundamental Theoretical Facts, Transfer of Energy from the Aerial. The Amplifier Stage, Problems of Detection and Frequency Changing, Selectivity, Receiver Noise, Gain Control, The Principles of Screening, Undesired Feedback, Hum and Spurious Beats, Distortion, Parasitic Resonances, Power Supply, Routine Measurements, Fault Finding. (It must be understood that Sturley covers only the R.F. and detection end, Part 2 of his book is in the press).

The best chapters in both books are those dealing with Aerial Coils and with Screening. Either of these books can be heartily recommended.

TIME BASES SCANNING GENERATORS.
O. S. Puckle (London 1943) ... 204 pages ... 26/6.

An excellent specialist volume dealing with a subject that has a surprisingly wide field. As may be seen from the following summary ... Introduction, Time Base Wave Forms, Types of Time Base -- operated from AC supply -- from DC supply, Hard Valve Types and externally operated. Then follows Trigger Circuits, Blocking Oscillators and Inductive Time Bases, Polar Co-ordinate Multiple and Velocity Modulation Time Bases, Linearisation of the Trace, Push-pull deflection, Synchronisation of Time Bases, and use of a time base for frequency division.

After pausing for breath Mr. Puckle then dives into a bunch of Appendices (the literary kind of course) as follows:- The Cathode Ray Tube, The Curvature of the Charging Characteristic. The Characteristics of a Gas Discharge Tube used as a Time Base Discharger Valve, Differentiating and Integrating Circuit. The Generation of Square Waves and etc etc.

SLOUCH HATS and FORAGE CAPS

Well, I simply hate to say it, and it is no doubt heresy or fifth column, or the act of a quising, but, thank goodness for Victoria, as without them this months notes would just about cease at the beginning. I often wonder where all the lads who were to supply me with notes (one from each state) are????? Any VK2,4,5,6, or 7 wanting the job please advise me and I will fix it with the Manpower. Hi! Gee, when I read that first sentence I am of the opinion that I had better keep away from the VK2 Division Meeting for a year or so. Hi!

Staff/Sgt Peter Vesper VK2PV has come to a stop at Ingleburn Camp Hospital after quite a bit of touring round, including a trip to Papua in the early "hot" days up there. So if the medicine tastes crook at the camp, you know who to blame. Hi! But crook medicine is, as some used to maintain about RAC (the "R-er" the better) it gets to the right spot.

Petty Officer Jim Kerley has moved South again and may be found at the Naval Depot at Flinders. Last time we mentioned Jim in this page we gave him a few letters after his name, which moved him to write a letter correcting our mistake. I've left the letters out this time but would be pleased to receive a letter (3NY). Incidentally, a laddie named Burke who worked with you, Jim, stays just near 2YCs.

VK3EC. We are indebted to Mrs. E. Cook of Swan Hill for some news of her husband Sgt. E. Cook of the R.A.A.F. 3EC has been stationed in the Darwin area for some time now and we understand that he is fairly close to Darwin. He is attached to the Office of Engineering Production at Headquarters, and is with a mobile unit. His address is Group 34, and he would be pleased to contact any other hams in this area (there must be quite a few, om..including, now 3RJ..2YC)

In Group 571 Darwin are 3EM Cpl Ted Manifold, and also Cpl. Clem Day 3GY. Both of these are looking forward to a spot of leave after fifteen months service up there. Both Ted and Clem have stuck together from the commencement of the initial course over two years ago. Also in this Group is W/Lt D.C. Stalker of Colac, better known as VK3KF.

Sqd./Ldr. Pat Boyd 3PB who recently figured in some good work up "north" is also stationed in the Darwin Area, after his long spell overseas.

Lt. Jack Davis VK2AFY is OC of a Radar W/Shop in VK4. He says "boy of boy, wait till I get back on the air again...have I got some bright ideas. Hi!" ... just haven't we all..2YC. However Jack has now a yf a Sgt. in charge of some of his equipment, and who hails from VK5, so I guess she has some "bright ideas" for Jack, as all good wives have for us all. Hi!

Had a visit the other day from W7EAX, whom as is the case with all hams at 2YC, we were very pleased to see. This lad is a pretty silent worker. Came to VK3 in '42, and somehow or other missed you all there. But in Northern VK4c he struck 4BC, thence to Brisbane and more Hams, then to Sydney to see VK2VV, OQ 2ABG and others. Even took a dash up to Canberra to see 2ID. He didn't know the Navy up there was full of Hams and may even make another trip. Norm is "sold on the Aussie Tea idea" and when he gets home the family had better get good and ready to quit "cawfee" and get on to tea. Hi! Norm is at present at Milne Bay.

Sgt. Ted Peppercorn 2QJ is out of New Guinea and fondly hopes he never sees it again..at least the parts he knows already. Ted received a notice with an awful red remark "Third and Final Notice" ... but the other two haven't caught up yet. Ted's time is taken up now with instructional work and looking after a W/T Workshop. He wants to know where one gets 16 gauge cadmium plated steel boxes and chassis made up...the answer Ted is "where, of where".

Jack Coulter 3MV is now Telegraphist on H.M.A.S. Mildura..keeping the sea lines open somewhere in the West or beyond. He reports having Ted Marley 4CJ as a passenger on one trip. Taken all round his luck with Hams has been right out. "Cpt" Bligh 3GR was on board and he missed him and worse still while in a US Naval Base a Yank Lt. or Cpt. put head in the cabin door and called out "any Hams here." But, alas, for 3MV, he just couldn't answer at the moment and when he could chase that yank he was gone forever. Hi! 3MV thinks the call was W7EYD.

Charlie Miller 4US/2ADF is stationed at Amberley, but would much prefer to be closer to the Jnr. ops Ian Charles and his older sister Heather. Chas thinks that possibly he may not be on the air quite so much after the War. Hi!

VK3JR another ex 200 mx man in the R.A.A.F. has the rank of Flt/Lt Chris Rainbow. Chris writes "At present I am Inspection Officer covering an area from Onslow to Albany in W.A., travelling by aircraft or car. Naturally radio is a section of the work I am interested in. In the Service I have met hams from all parts of the world and interesting ragchews were indulged in. Met Col. Ferguson VK5CJ on my last leave. He was then a W/O Signals R.A.A.F. and was going for his commission."

You all know how I've waited and waited for Sqd/Ldr Arthur Waitz 4AW to visit me and dig out the air-raid shelter. Well he arrived OK the other Saturday and when I opened the door he handed me a medical certificate saying "Malarial patient, too sick to work!! An officer - huh! so he sez - but a....well I ask you!! Glad to see you anyway Arthur and I'll keep the job "open for you" Hi!

And that just leaves me a little space to put in what is called my "usual wange". You can all sing it with me "where's those notes"??? The QRA is Jim Corbin, 78 Maloney St, Eastlakes, Mascot and the 'phone number is MU1092...and Hams are always welcome.

D I V I S I O N A L N O T E S .

- NEW SOUTH WALES DIVISION -

The August General Meeting of the Division was held at Y.M.C.A. Buildings on Thursday 17th August. The attendance was quite a good one and the Chairman in declaring the meeting open, extended a welcome to Petty Officer Telegraphist W. L. Harris VK2ALX, Petty Officer Telegraphist Frank O'Dwyer VK3CH, Sergeant Harry Mendel VK2??? Norman Jannin W7FAX, Jeff Savage VK2ABF and Alex Borlan ex-XFT.

Members were informed that a re-shuffle in Office Bearers had taken place since the last General Meeting both the Secretary W. G. Ryan VK2TI and the Chairman R. A. Friddle VK2RA having asked Council to relieve them of the various duties attached to these Offices. As a result of this re-shuffle the Meeting was informed that Wal Ryan VK2TI had been unanimously elected Chairman and Mr. Chas. Higgins VK2LO was the new Secretary. It was decided to place on record the Division's appreciation of the sterling work performed by 2RA as Chairman of the Division, a position he had occupied for the past few years. The new Chairman VK2TI stated that upon many occasions he had been given all the credit for the B.C.N. but this was not true as 2RA, and he alone, was responsible for planning the scheme. 2TI also went on to say that during his eight years as Secretary of the Division he had been associated with three Chairmen, all of whom had been a tower of strength to the Institute, but of these three men, he felt confident in saying that 2RA had had a most difficult job in guiding the Institute during the war years and for that reason alone his work had been of the utmost value, and that he was entitled to be numbered among the stalwarts of the Institute.

The meeting was informed that the Bushfires Advisory Committee had requested the Institute to obtain a Census of Equipment and available Personnel in order to inaugurate a Bush Fires Radio Network. This is good news for Country Amateurs and by now you should have received a questionnaire in connection with this matter. The B.F.A.C. were anxious to put this scheme into operation immediately but before committing the Institute to any action it was felt that it would be preferable to have some knowledge of what would be available. It is fully realised that quite a number of Country Amateurs are on Service and that others left the Country for the City. One thing is certain however and that is this, the Network will go into operation as soon as possible even if only on a small scale and thus provide a nucleus for the time when the boys come home again.

Briefly the scheme calls for a number of portable transmitters to operate at the scene of the fire, a forward base station to maintain communication with the Firefighters and the town. It is anticipated that frequencies will be in the 2-3 megacycle band.

Many times in the past the value of the E.C.N. has been stressed as a means of demonstrating the value of the Australian Amateur to the powers that be. Here is the first evidence of that demonstration. If the Australian Amateur is to take his place in Emergency Communication in the very rapidly approaching days of Peace the most important avenue will be Relief work and what more important to Australia is the control and eradication of Bushfires.

When the E.C.N. was first formed quite a few Country Amateurs felt that they had been left out in the cold and that their interests had been overlooked. Perhaps they had some reason to feel this way but it was pointed out at that particular time that the Institute had no say in the location of stations. The Bushfires Net should be an answer to this criticism. Go to it fellows. Remember the size of the scheme will depend entirely upon the response to the circular.

The British Broadcasting Corporation are anxious to make comparisons with their Pacific Service and that of the Germans, and has asked the co-operation of experienced listeners. The Senior Radio Inspector has asked the assistance of the Institute in this matter and this had been willingly pledged. The Tests will be held over the first seven days of each month September, October, November, December and Report Forms will be sent to fifteen different members of the Division each month. Every member who receives a circular is asked to co-operate and remember this, you are only asked to do this one month. By this means it is anticipated that every member of the Institute will have participated and thus an excellent cross sectional coverage will be obtained.

At the conclusion of General Business, three informal talks were given by the visitors commencing with P/O Tel W. Harris, who gave a vivid description of the action off Guadalcanal and the sinking of H.M.A.S. Canberra - on which he was stationed at the time, and gave the lie direct to many rumors as to the actual cause of her sinking.

Wilf was followed by Sergeant Harry Mondel who gave a humorous description of the difficulties encountered when Radio gear went "trotto."

Our American visitor turned out to be one of the quietest of the species that we have yet encountered and can't understand why the W6's could work the VK's so easily. He reckoned it was all in the question of antennas. Some of the lads didn't altogether agree. In fact they had a bit to say about the "California Kilowatt."

The next General Meeting of the Division will be held at Y.M.C.A. Buildings on Thursday 21st September and a cordial invitation is extended to all Amateurs to be present.

EMERGENCY COMMUNICATION NETWORK.

With the Battle of the Pacific rapidly drawing to an end and hostilities getting closer to Japan it was logical to expect that there would be some re-organisation with regard to National Emergency Services.

The Premier, Mr. W. J. McKell has decreed that whilst all exercises are to be reduced to a minimum, key personnel are to be retained.

The point was stressed that the Network is now considered a very important if not the most important part of the N.E.S. organisation and no slackening off is to be observed. This indeed was a great compliment and reflects no little credit on the splendid work that operators have done and will still continue to do.

Exercises are now held on the First Tuesday and Third Monday of each month and although the traffic handled is not as great as previously, enough messages are received to make the Exercises quite interesting.

Here is a message to all Network personnel bearing upon previous paragraphs. With the falling off in N.E.S. activities you may be reasonably forgiven for feeling that there is not much use in attending your station each month. Nothing is further from the truth. I ask you to realise that the Network only came into being after a three years struggle to be recognised. The amateur movement has gained a tremendous advertisement from the operations of the Network. If it is decided that the Department of National Emergency Services is to be discontinued, it is up to every operator to see that the Network functions right up to the time that this decision is made ~~AND TO DO NOTHING THAT WOULD HASTEN THE DECISION.~~ Quoting an extremely hypothetical case, it must never be said that one of the reasons for closing down N.E.S. was the failure of the Radio system. I trust I have made myself clear!

.....oOo.....

VICTORIAN DIVISION .

This division has been approached by the Forests Commission with a suggestion whereby Institute Members in certain country areas could co-operate with the Commission's Radio network. While at present no definite scheme has been evolved, Council in an endeavour to ascertain what Members and how they can assist in any scheme, a circular will be received by Hams in certain areas in the course of the next few days:

As pointed out earlier, only Hams in certain areas will receive this questionnaire, which they are asked to read carefully, and at the same time answer the questions very carefully, as the information is vital to any scheme which may come into being. Hams receiving this questionnaire are asked to treat the matter as URGENT.

Non-financial members are notified that this issue SEPTEMBER will be the LAST forwarded until such time as they renew their subscriptions.

At last Council meeting all Officers were re-elected for the ensuing term. Messrs. R. Marriott, Chairman of Council; R. A. C. Anderson, Secretary; and J. G. Marsland, Treasurer. Sergeant A. R. (Bill) Williams was appointed to Council as Country Representative.

As promised in the last issue a further report of the Annual General Meeting would be included in this issue. The meeting was predominated by members of the services as well as being truly representative of all States including America. These included:- Major D. Knock VK2No; F/L. John Traill VK2XQ; F/L D. H. Dougan VK2AMP; Sgt. Les Taylor VE2CL; F/L R. C. Harris VK5FL; F/s H. Dangerfield VK4NT; Major Ivan Miller VK3EG; F/L W. J. Nicholls VK3WX; F/s N. Foxcroft VK3UQ; Capt. G. I. Patterson VK3YP; Wing Commander W. Gronow VE3WG; and Charles Garvey W8WNN T/Sgt. Victorian Council hopes that these Hams will be regular visitors at the meetings in future.

Also present were representatives from the Victorian Railways Institute Radio Club well known in pre-war days as VK3RI. These members of 3RI were: Messrs. O'Brien, Orchard and Sykes. The Victorian Division extends a cordial invitation to all members of the Club to attend the Victorian Division meetings.

Congratulations to Mr. and Mrs. Bruce Plowman (VK3QC) on the recent arrival of a YL op.

.....000.....

WANTED TO BUY, SELL OR EXCHANGE.

Readers are invited to advertise their wanted to buy, sell or exchange under this heading....Rates....sixpence per line.

WANTED TO PURCHASE.

WANTED - Split-Stator Condenser, double spaced, not more than 100mmfd in each section, also midget type of same capacity not necessarily double spaced. Full particulars to W. G. Ryan, 21 Tunstall Avenue, Kingsford, N.S.W. (If equipment is under seal, arrangements will be made for release.)

THE WIRELESS INSTITUTE OF AUSTRALIA



Divisions of the Wireless Institute of Australia exist in every State of the Commonwealth. The activities of these Divisions are co-ordinated by Federal Headquarters Division, the location of which is determined from time to time by ballot.

Present location of F.H.Q. :— New South Wales

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Vice-President : H. F. PETERSON, VK2HP. Federal Secretary : W. G. RYAN, VK2TI.

Councillors : C. FRYAR, VK2NP ; W. J. McELREA, VK2UV

Official Organ : "AMATEUR RADIO"—Published by the Victorian Division.

VICTORIAN DIVISION

191 QUEEN ST., MELBOURNE

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Visiting Overseas and Interstate Amateurs are welcome at meetings and they are invited to communicate with the Membership Secretaries :

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NEW SOUTH WALES DIVISION

Registered Office :

21 TUNSTALL AV., KINGSFORD

Telephone : FX3305

Postal Address : Box 1734JJ, G.P.O., Sydney

Meeting Place

Y.M.C.A. BUILDINGS, PITT ST., SYDNEY

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R. MILLER

Subscription Rates

Full Members 10/6 per annum

Service Members 7/6 per annum

The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and an invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

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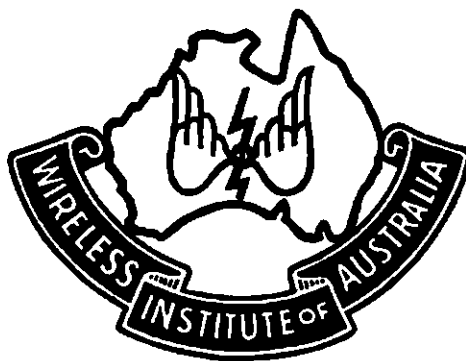
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OCTOBER, 1944

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AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol. 12. No. 10

October, 1944.

AMATEUR TEST EQUIPMENT REQUIREMENTS

CHARLES C. QUINN...VK3TQ

As promised in last month's issue a demonstration of the apparatus described was given in the Victorian Divisions Rooms at the August Meeting, and most of those present agreed to the need of such a bridge and the others were definitely interested, quite an interesting discussion took place.

On page two is the circuit diagram of the bridge with slight modification from the original. Following also is a table for the calibration of the 2500 ohm power factor correction variable resistor in series with the 1 mfd standard (at 50 c/s).

A scale can be easily made to represent the power factor on the panel of the finished instrument, but the scale for calibration of capacity and resistance (1000 ohm) is difficult to reproduce in practice and also here.

It is suggested that a search of junk stores will reveal an old three inch knob with attached metal pointer, or if preferable to the constructor, a PRECISION dial could be used, and the old calibration wiped off.

It is assumed you have been able to buy, or otherwise obtain good standards which are within a certain percentage...this percentage will of course determine the accuracy of the bridge.

You are now ready to calibrate the scale. Some people are lucky and may be able to borrow a reliable decade which will help tremendously, but for those who cannot, it is suggested that light pencil marks be put on the scale for readings of say at least a dozen of the one particular type of resistor under test, and the mean or average be taken as a "reference" reading until some definite check can be obtained.

For capacity, quite a serious problem presents itself because very few standards are available to the average Ham, however if you are sure of your resistance calibration, remember that capacitance is the reciprocal of resistance and mark your scale accordingly.

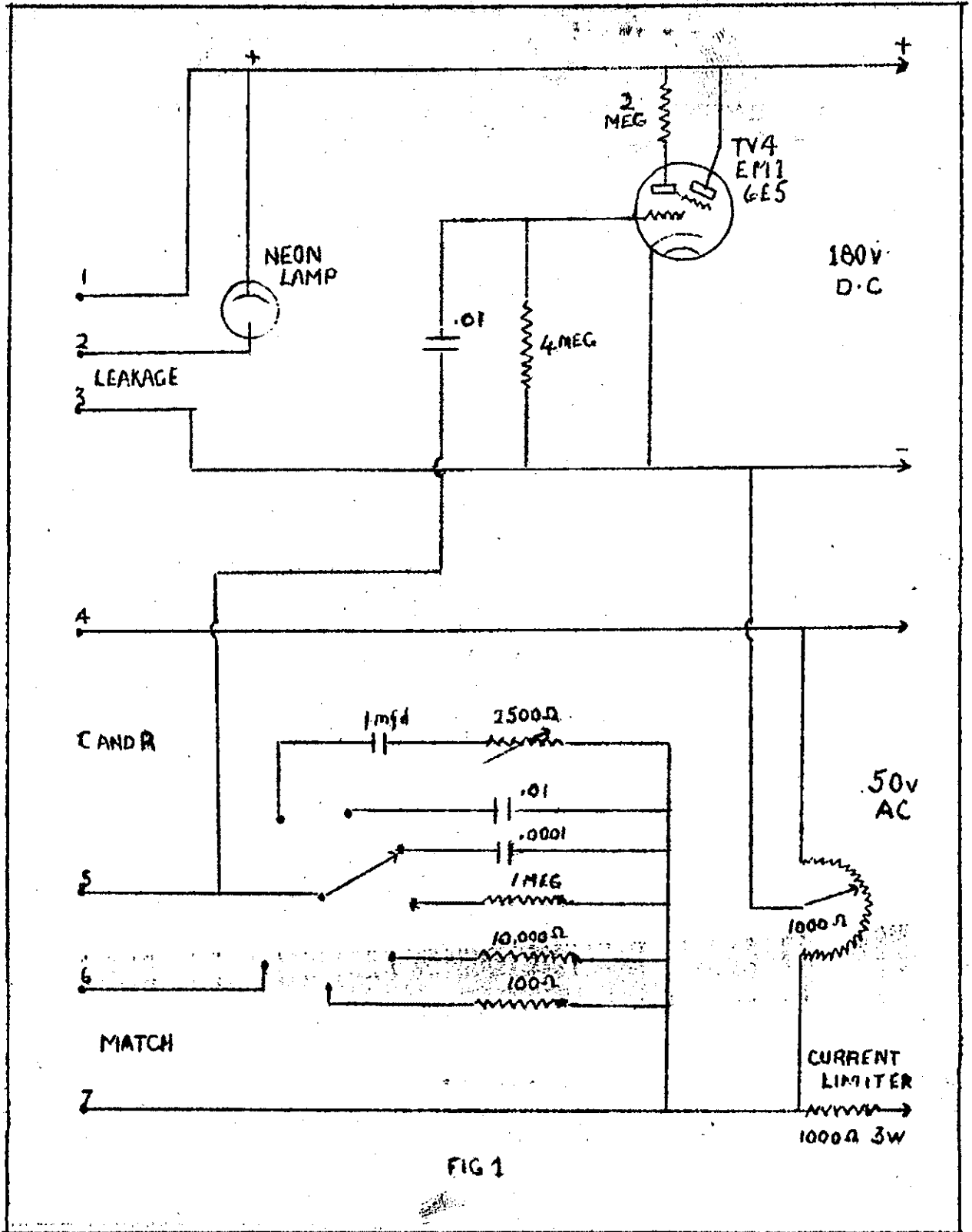


FIG 1

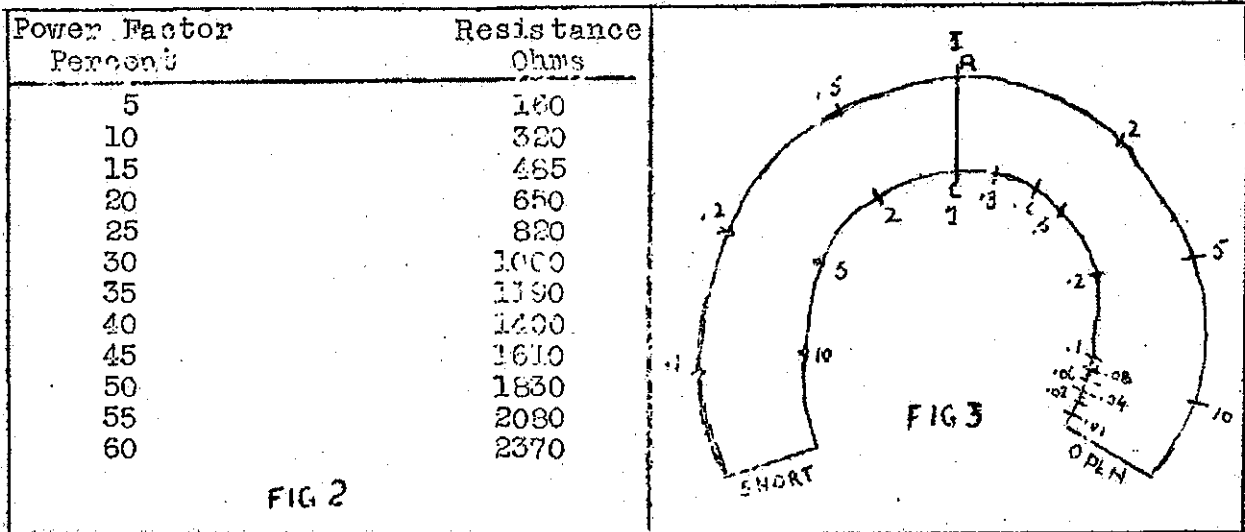


FIG 2

It will be noted in Fig 3 that the scale is set out logarithmically, that is the index number and nearer ones are separated by decreasing distances.

In use (the bridge part of the circuit) the unknown is connected between 4 and 5 and the switch arm moved to the desired range, the 1000 ohm potentiometer is then adjusted until the eye OPENS fully. If a resistor is being checked the eye will open fully with no furry edge--on the other hand a condenser will show (on the medium and high ranges) either a clean cut or increasingly furry edge, while bad condensers will be impossible to check unless they are within the range of the 1 mfd condenser and the 2500 variable resistor.

To give an instance---an ignition condenser (across make and break) of an old car was giving trouble. On application we could get no indication on the eye, but varying the power factor to the extreme reading cleaned up the eye, so that there was no trace of "fux" -- the reading on the power factor calibration was 55%.

Other uses of this piece of apparatus are as follows:-

1. Will indicate "balance" in RF transformer windings of large inductance, not less than 1 henry, and smaller iron cores, using terminals 4 and 5.
2. Using terminals 1 and 2 neon lamp alone for external use.
3. Using terminals 2 and 3 leakage test for condensers and suspected faulty resistors. Another use, if it is suspected that variable condenser plates are touching, disconnect the coil and insert condenser across 2 and 3 -- sparks will indicate where plates are touching.
4. Terminals 2 and 4 or 7 will give a continuously variable 50 volt source of AC at a few milliamperes.

5. With range selector on to "Match" a means is available to check or compare a given component with others.
6. Using terminals 6 and 3 the eye is available for indicating in AVC circuits, or if some means are available for calibration the eye can be used as a VPVM with 4 volt maximum reading -- more in a later article -- with an input impedance of 4 megohms.

MULTI-VIBRATOR

This was originally written up in Amateur Radio for February 1940 and it has to be used to be appreciated, just like anything else.

Following is the circuit which again is quite simple and requires only one tube and a minimum number of components.

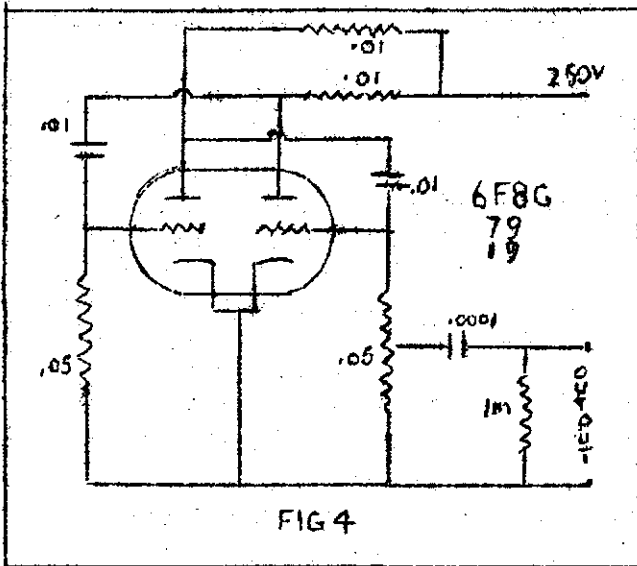


FIG 4

Wave form is something like a saw tooth oscillator only worse. The frequency of oscillation is determined by the combination of plate and grid resistors and condensers (time factor).

The usual fundamental frequency is approximately 500 c/s producing harmonics spaced every 500 cycles to approximately 20 megacycles (15 metres). Normally the individual peaks cannot be separated by the radio receiver, so a constant signal is heard from 500 cycles right through the operating range of the Multi-vibrator.

For Amateur uses the simple one in Fig. 4 can be applied to a number of uses, principally for finding faults in receivers and amplifiers. The output of the multivibrator when applied direct to a speaker will give a useful signal and then by working back stage by stage the faulty stage can be located. More exact uses will be covered later.

Much more elaborate Multivibrators have been designed and used with success as per ARRL Handbook, where they are used to pick off certain frequencies in conjunction with fixed oscillators to produce regular signals throughout the tuning range at 50 or 100 Kc separation.

If a number of readers are interested a future article will be prepared, setting out applications to these various uses.

POST WAR AMATEUR RADIO

ESSAY by P/O Tel. Sydney T. Clark

.....

How many of us are wondering what will happen to the "Ham" in those, bound to be hectic, post-war years?

Even in New Guinea the word has gone round that the Institute is running a competition and we Hams in this country of rain and things far harder to take, write to tell you of our hopes and our fears.

I think Amateurs should be granted privileges similar to those extended to us in pre-war days.

Yes "Mister Disher Outer" of Frequencies and licences, haven't we earned them.

Those thousands of us who could, fighting in every clime, on land, on sea and in the air. Those hundreds left behind because of age or some other bar. They too have earned that privilege. They helped build us the gear we use, they also, in their spare time, worked hand in hand with the emergency services, giving their time and equipment, where suitable, freely, so that more efficient communications might assist in the fight for freedom.

Frequency allocations should be made in bands harmonically related and, although 1.75 M/cs will probably have to go, who cares? Has not UNF working already shown that it can fill the breach for local working.

The DX Bands what will become of them? That question haunts the mind of every Ham with a yen for DX and the friendships it brings.

As to power; will higher power make for more efficient communication? My answer is, Yes, if intelligently used. I suggest a power limit of 250 watts input to the final amplifier. Beginners should be limited to 50 watts for a period. An increase to 100 watts should be then allowed, and if that man uses his additional fifty watts intelligently, let him increase power to the limit.

Most certainly the Institute should have a permanent staff; but let that staff be the servants of the Institute and not the Members become servants of the staff, and the Institute a tool in their hands.

As to the question of having "all amateurs" members of the W.I.A. The very definition of an amateur precludes that possibility. For is not an amateur one interested in "Experimental Radio." Therefore why should all amateurs be forced to join an organisation such as the W.I.A. before being granted a transmitting licence.

By all means encourage membership, but do not try to force it. For although I am a member of the Institute and will do all in my power to help it grow, I am a member voluntarily and therefore an enthusiastic member. If there was the slightest suspicion of

coercion, I should deny myself privileges to which I have a right as a citizen of the country which granted those some privileges rather than submit to coercion.

Amateur Radio can be and will be better organised in post-war years than it was pre-war.

Yes, service and civilian reserves should be maintained, and although they should, and I think shall have their own operating frequencies, it is the patriotic duty of all "hams" possible to belong to such bodies for nothing more than a square inch of quartz to ensure those frequencies are adhered to.

Yes, let the amateur give some of his time and the use of his gear in reserve exercises merely as repayment for a privilege extended to him.

I think the national body of amateurs should act jointly with the licencing body in controlling amateur radio and disciplining any amateur where such action is necessary.

It has been proved time and again that co-operation can go places faster than non-co-operation.

We have our hopes, and our fears for amateur radio in the post war years: I think that if we all co-operate the issue will be decided for us and undoubtedly in our favour.

.....000.....

STANDARD FREQUENCY TRANSMISSIONS.

The following information regarding standard frequency transmissions is taken from information provided by the Bureau of Standards, Washington.

The service comprises the broadcasting of standard frequencies and standard time intervals from the Bureau's radio station WWV. It is continuous at all times day and night, from 10 KW transmitters except on 2.5 MC where 1 KW is used. The services include: (1) standard radio frequencies, (2) standard time intervals accurately synchronized with basic time signals, (3) standard audio frequencies, (4) standard musical pitch 440 c/s, corresponding to A above middle C. The standard frequency broadcast service makes widely available the national standard of frequency, which is of value in scientific and other measurements requiring an accurate frequency. Any desired frequency may be measured in terms of any one of the standard frequencies, either audio or radio. This may be done by the aid of harmonics and beats, with one or more auxiliary oscillators.

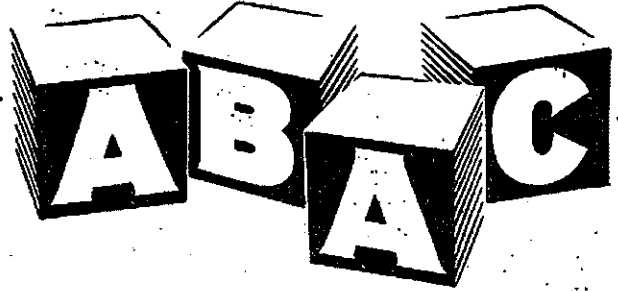
At least three radio carrier frequencies are on the air at all times, to ensure reliable coverage of the U.S. and other parts of the world. The radio frequencies used are:-

- 2.5 MC broadcast from 2300 to 1300 GMT
- 5.0 MC broadcast continuously day and night,
- 10.0 MC " " " " "
- 15 MC " from 1100 to 2300 GMT.

Two standard audio frequencies, 440 c/s and 4 000 c/s are broadcast on the radio carrier frequencies. Both are broadcast contin-

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ously on 10 and 15 MC. Both are on the 5MC in the day-time, but only the 440 is on the 5MC from 7.00pm to 7.00 am EWT. Only the 440 is on the 2.5 MC. In addition there is on all carrier frequencies a pulse of 0.005 second duration which occurs at intervals of precisely one second. The pulse consists of five cycles, each of 0.001 second duration, and is heard as a faint tick when listening to the broadcast; it provides a useful standard of time interval for purposes of physical measurements, and may be used as an accurate time signal. On the 59th second of every minute the pulse is omitted.

The audio frequencies are interrupted precisely on the hour and each 5 minutes thereafter; after an interval of precisely one minute they are resumed. This one minute interval is provided in order to give the station announcement and to afford an interval for the checking of radio frequency measurements free from the presence of the audio frequencies. The announcement is the station call letters WWV in code, except at the hour when a detailed announcement is given by voice. This also occurs at half hour periods.

The accuracy of the frequencies, radio and audio, as transmitted is better than a part in 10,000,000. The time interval marked by the pulse every second is accurate to 0.00001 second. The 1 minute, 4 minute, and 5 minute intervals, synchronized with the seconds pulses and marked by the beginning and ending of the periods when the audio frequencies are off, are accurate to a part in 10,000,000.

C O R R E S P O N D E N C E .

200 MX. BAND. PHONE:

.. By Chas. R. Whitelaw, VK3BH ..

After perusing the musings of 3N.K. and 3WQ in September, "AMATEUR RADIO" I feel I must have a few words to say, although 3WQ says he does not want to start a commotion. As one who used the 200 mx band ever since it was allotted to us, I think we should still be allowed to do experimenting on this band. As for entertaining the B.C.L's, we most certainly did, and also kept the fact under the public notice that there were such experimenters as 3 N.K. and 3 W.Q. I think the 200 mx transmissions were certainly the best publicity that hams got. Also as a member of the Institute since 1912, I never did at any time, offer the slightest suggestion, that this or that wave length should be taken away from other hams, just because at that time I was not actively interested in that frequency. No, 3NK and 3WQ, try and get more frequencies and more latitude, but NO, a thousand times NO, do not suggest that any of the hard won privileges be sacrificed. I am sure none of the 200 mx hams would suggest that the 80 and 40 mx band be cut out.

I started experimenting in Radio in 1908, (No, I won't get out and give it up), and I still think there is plenty of experimenting to be done on all the allowed frequencies. I consider that most of the present engineers of the Broadcasting stations got their knowledge whilst operating 200 mx band stations. I found out some very interesting facts while "entertaining the B.C.L's" and was well on the road to F.M. when the "big stoush" started. I certainly did make my experiments so that "they would entertain the B.C.L'S" and from what I heard, I succeeded, and hope again to do still some further experimenting on this band. If 3 N.K. and 3 WQ think that this band should not be made available to the Institute, then let the Institute Councilors press for a special licence under special conditions, and a special fee of £5-5-0 be paid for the privilege, then we could see who genuinely wanted to carry out experiments on this band.

I am fully in accord with all the rest of the letters of 3NK and 3WQ, but for the sake of Ham Radio, never, no never, throw up any of the hard fought for privileges granted to experimenters. Remember the oft repeated saying, "United we stand, divided we fall," and "Unity is Strength." The Authorities have been remarkably reasonable and fair to all experimenters, and I am quite sure that they will continue to do so, provided there is to be no squabbles over who should have this or that frequency. Pull together fellow Hams, and hold what we have, and get every Ham or prospective Ham into our ranks. Heres hoping that we shall soon get the dust off all that gear and that 3 NK and 3 WQ get all they want and one day have something to say to 3 BH over the air.

CHAS. R. WHITELOW,
V.K - 3 B.H.
Box 35, Post Office,
EUROA. VIC.

SLOUCH EATS and FORAGE CUPS.

Seems as though all the VK Hams have gone into a kind of "hush-hush" session. There doesn't seem to have been anything happening much at all - however here goes.

It's a pity all these chaps who get write-ups in the Press couldn't have their call signs added. What a boost to Ham Radio it would be. The following appeared recently, and in case you do not know, his call sign is VK3FB:- "The distinguished Flying Cross has been awarded to acting Squadron Leader Joan a'Beckett Penleigh Boyd, of East Malvern (Vic) for brave conduct during operations in the north-western area." The citation states that Squadron Leader Boyd led a formation of four aircraft on a long-range mission. On arrival at the target he led the formation over the airstrip, destroying two twin-engined fighters taking off. Then, while the others strafed shipping in the harbor, he climbed and attacked four twin-engined fighters single-handed, with complete disregard for intense anti-aircraft fire, the citation goes on, he then attacked and damaged a ship of 1500 tons in the harbor. Squadron Leader Boyd has displayed great determination and outstanding organising ability, while his courage and example have been an inspiration to the squadron.

Sgt. Clarry Castle VK5KL writes from Group 781 Darwin. He got a "loan" - shame! (see to it Ed.) of our Mag. from one Jim Perooz - VK2PZ - last heard of as a W/O - and read that we wanted news. (I ask you - still did you ever read this column and we weren't what is called "winging for news - hi!) Anyhow Clarry's VEM work is "hush-hush" so we skip it. He has built a complete recording cutter equipment except for cutting head - and wants to know if anyone knows where he can purchase a "Presto" or similar job. His address is given above.

VK 3NY - had a couple of service visitors during the month - 3BV - Flying Officer Len Burston who called in on his way to Adelaide. Len has moved around a bit in his five years of service, being one of the lads who got away from Singapore during the last few hours. More recently he has seen service in the North where he has been Signals Officer at an O.B. (?? Operational Base?). Another visitor was LAC Wallace 3VV - on leave from New Guinea. Some of the hams he has met are 3WM Flying Officer Wilson, 3BG W/O Roth Jones, 4EA W/O Ashlin, LAC Maguire 3KL and 3WC Sgt. Chas. Nelson.

We have just learned of the death on service of two VK3 Hams. VK 3IE - J. E. Mann of Ballarat was reported "Missing - Believed Killed" when H.M.A.S. Parramatta was sunk in November, 1941. His brother Leonard Mann, 2nd op. at 3IE has recently been discharged as medically unfit after several years as a W/T operator on the Sunderlands with No. 10 Squadron R.A.A.F. Another Ballarat Ham - Signaller S. W. Jones, VK3SP was killed in action in New Guinea on Feb. 1943.

W/O Con Bischoff - VK 2LZ - is still up at Group 815 Townsville and appears to be quite satisfied with his job these days. Many Hams who met Con's Father during the years when 2LZ was ever active will regret to hear of his sudden death last June. Mr. Bischoff was as keen a Ham really as ever son 2LZ was. Con and family can be assured of the sympathy of all their Amateur friends.

Bill Moore - VK2MZ, has had a couple of letters reported by the Dept. of Information - Listening Post - as having been read over Batavia Radio. From those Bill reports himself in charge of food supplies, and is stationed with other prisoners on a small farm. The letters sound cheery enough and say treatment is O.K. and the main food is RICE!

Squadron Leader Douglas 3YK - a friend of Bill's over in Malaya and who was with him in Batavia passed through Sydney on his way home for a spot of leave after much service with the most forward groups of the R.A.A.F. Sigs. From memory I'd say he certainly seems to have done more than his share of tropical service.

In last month's column I said 2PV - S/Sgt. Peter Vesper was "settled" at Ingleburn and this month he writes to say he has "moved to the first base" - i.e. Hay - Hell and Sooligal to go. He now dispenses for the Nips at Hay in an atmosphere of barb wire - compounds, machine guns and blazing arc lights - and I guess since that "outbreak" - much vigilance!!! Oh well - Peter - the summer is NICE - I come from Griffith - hi! - so I know.

Major Ron B. Knock was also up in VK2 on a spot of leave, to dodge acquiring that "liver" he says every Major should have. But by now he is once more back at VK3 and on with the job. He says 4A" dodged silently back there a fit man once more and still my air raid shelter waits, Hi!

P/O Bill Lewis VK6YB/2YB also was in Sydney for a time and he too is "moving North." Bill was last stationed at Sale but by now has a new and more interesting ORA. Daughter Sandra sure has her Paddy on a string...Hi! Still Bill looks pretty fit and no doubt he likes it. Hi!

I must now exercise great care as I speak of one Stevens 3ZK of Swan Hill...in the R.A.A.F., and more important a friend of the Magazine Committee. Well, he came unannounced and found the yf at a wedding, and Pop struggling with the kids, the shop and the washing up...but even the yf said afterwards, he was one of our most pleasureable visitors...as he made himself at home...but that was only because I had him "wiping up" when she arrived home...oh we were doing the lunch things...about 4.30 p.m. Hi! Yes, on reading that I reckon Tommy can't say a thing, but I await some violent reactions from Swan Hill. Hi!

Well, be seeing you all next month...I won't insult your memory with the "refrain" of the ORA...anyway you should read inside the back cover

D I V I S I O N A L N O T E S

NEW SOUTH WALES DIVISION

The September General Meeting of the Division was held, as usual, at Y.M.C.A. Buildings. Quite a number of visitors were present including Lieutenant J. Kizzire W4EVY, Skipper Small, Commanding Officer Sydney Harbor Patrol Skipper Weingott, Chief Wireless Officer Sydney Harbor Patrol Stan Grimmet VK2ZW, Lt. Commander Lionel Swain VK2CS, Sergeant Mills VK2AJW and Peter Adams VK2JK.

Members were informed that the Bushfires Emergency Radio Network was making satisfactory progress and that it had been decided to form Nets in three Country towns. At the time of writing these sites had not yet been decided upon. Naturally the Bushfires Advisory Committee would have the final say in the matter of location. In forwarding the circulars a considerable handicap had to be overcome in view of the fact that the 1939 List of Experimenters had to be used. If you know of any country member that did not receive a circular, kindly get in touch with the Secretary of the Division.

The Meeting was informed that Council had considered the best means of showing appreciation of the fine services rendered the Institute by Mr. Ray Priddle VK2RA. 2RA, as you were informed in the last issue of the magazine recently resigned as Chairman of the New South Wales Division. During the past three years he had occupied the positions of Federal President, Chairman of the New South Wales Division and had been a member of the N.E.S. Wireless Committee. Council's recommendation that he be elected to Life Membership was unanimously endorsed. 2RA in replying, stated that he deeply appreciated the honor conferred upon him, and stated that his efforts in the past had been directed towards helping Amateur Radio.

A further recommendation from Council that the sum of £2/2/- be donated to the fund now being raised for the equipping of a British Centre in Sydney, was unanimously endorsed.

Old timers will regret to learn of the passing of Reg Fagan VK2RJ. Reg was one of the stalwarts of the Institute, and although seldom appearing at meetings due to his location, did quite a deal to help in many ways. Interested in Radio from the time of its inception, working on 240, 80, 32 and 40 metre bands and in more recent days on 20 metre fone. One minutes silence was observed by the meeting in memory of 2RJ.

Skipper Small of the Sydney Harbor Patrol, then addressed the meeting and gave details of the history of this fine organisation during the war years. Mr. Small who is the Commanding Officer went on to say that it was his ambition to build the patrol into an organisation similar to the Coastguard in the U.S. Skipper Small was followed by Skipper Weingott, Chief Wireless Officer, who made a n appeal for operators.

The Chairman, in summarising the remarks made by Messrs. Small and Weingott said that he heartily recommended that as many members

possible take advantage of Mr. Weingott's offer. In pre-war days amateurs through the Institute had long striven for recognition as a means of providing emergency communication. The future was very rosy. The country amateurs would have their Bushfires Net whilst city and suburban experimenters, the Sydney Harbor Patrol. All this had been brought about by the operations of the Emergency Communication Network. This organisation by their fine work had been responsible for demonstrating the value of Experimenters and their equipment, and the authorities had been quick to grasp the opportunity of putting more and more equipment to work. Any member who was not present and desires further information, may obtain same by ringing the Chairman at PX3305 or Mr. Ray Weingott at LA3763. E.C.N members who would like to join up with the Patrol are reminded that they can only do so on the understanding that Network practices come first.

At the present time these Networks are only functioning in VK2. Nothing would give New South Welshmen greater pleasure than to see them operating in all States.

Lt. Commander Swain VK2CS gave a very interesting account of life in the Navy. His remarks with reference to the Boarding Party were very much appreciated particularly to references to "what happens when the shore battery fires on the hostile craft" whilst the boarding party is still on the ship! In his remarks Lionel paid a great tribute being done by Mr. Allan Fairhall VK2KB. Members who knew what Allan's job is were astounded to learn that he had placed his services at the disposal of the Commonwealth entirely without remuneration.

Jim Kizzire W4EVY stated that he was enjoying the meeting very much, particularly those references made to emergency work as he was very interested in that phase of amateur activity in the States.

The October General Meeting will be held at Y.M.C.A. Buildings on Thursday 19th October. Country Members, particularly those interested in the bushfires scheme, who may happen to be in town, are particularly requested to note the date and be in attendance.

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THE SYDNEY HARBOR PATROL.

The Sydney Harbour Patrol (S.H.P.) originally The Volunteer Coastal Patrol (V.C.P.), was formed in March 1938 - this fact alone will come as a surprise to many. It was founded by amateur yachtsmen and supported by certain Naval officers for the purpose of training men for service in small naval vessels such as M.T B's, M.C.B's and other similar craft.

When war broke out the Patrol was well established and soon attained a membership of some six hundred men. After receiving training, many of these men joined the various Services, particularly the R.A.N., R.A.A.F. Marine Section and A.I.F. Water Transport Section.

Before and during the early part of the war, many men had enrolled who eventually found that because of medical grounds, essential employment or other reasons, they could not enlist in the services, and these men continued voluntarily to attend the Patrol's instructional courses in elementary navigation, signalling, first aid, chart work and higher navigation - all with the sole objective of being of some service to the Nation if required.

Up to June 1940 the Patrol's services had been called upon on many occasions to co-operate with the Army in beach landing exercises and mock enemy attacks on various parts of the N.S.W. coastline from Port Stephens to Lake Illawarra, and high commendations for these efforts were forthcoming from such men as Brigadier (now Major-Gen.) J. J. Murray and Major-General A. G. Newtrell.

In June 1940 the Patrol was requested by the N.S.W. Police Dept. to supply vessels and crews to perform security patrols every night of the week in the Port of Sydney. With this first official recognition the Unit's vessels were permitted to fly the N.S.W. State Blue Ensign - an honour that is still retained.

In October 1942 the V.C.P. became known, for official purposes, as the S.M.P. with the Harbour Master of the Port of Sydney as its directive head.

As the S.M.P. the Unit carries out duties for the Maritime Services Board of N.S.W., N.S.W. Police Dept. and Dept. of N.E.S.

Five vessels are rostered for duty every night of the week between the hours of 6 p.m. and 6.30 a.m. the following morning. These vessels patrol that part of the Harbour, West of the Bridge, and, in doing so, contact the watchmen or guards at vulnerable points on the waterfront, and their crews are responsible for the protection of life and property thereon from sabotage, with particular attention being paid to the security of shipping and wharves in the Port. At the present time one of their most important duties is that of policing both the Army and Port regulations as they apply to ammunition ships - the importance of this duty should be readily understood by all, in view of the tragic explosions of ammunition ships in Bombay, San Francisco and elsewhere.

In event of emergency Patrol vessels are also responsible for (1) the operation of oil retaining booms at petrol depots, (2) supplementing the manning of fire floats with trained personnel, (3) rescue and evacuation of injured from ships and wharves, (4) general Police duties - suppression of pillaging, looting etc. In the performance of these duties man hours have totalled 269,067, miles travelled 121,355 and patrols carried out number 5,885.

It is intended that the Patrol should remain as an organised unit in the post war era, because it is felt, by both its own executive and certain Government officers, that it could continue to serve the community as a useful organisation.

As in every other Service, Communications are vital. Without an efficient system, the value of the Patrol to the community would be considerably reduced.

The Patrol has a Radio system in operation using commercial type equipment and an appeal is now being made for operators, preference in all cases being given to holders of the A.O.C.P. although this is not essential. There are two ways that you may enrol, firstly on a 6 p.m. - 10 p.m. basis one night each week, or 6 p.m. 6.30 a.m. one night per week. Any further information may be obtained from Mr. Ray Weingott L.A.3763 or W. G. Ryan FX3305.

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V I C T O R I A N D I V I S I O N .

Council is gratified to announce that the co-operation scheme with the Forests Commission of Victoria, and this Division has advanced to the stage that subject to P.M.G. approval, emergency stations will go into operation in four or five areas as soon as the necessary details can be finalised.

Some other areas from which Hams have replied to the recent circular sent out, will, it is hoped, also go into operation. It is probable that they will be delayed somewhat as at the moment the full amount of equipment cannot be arranged. With further answers to the circular coming to hand, arrangements will be made for the equipping of stations.

A notable visitor at the VK3 Meeting on Tuesday night last, October 3rd, was Wing Commander Cunningham VK3ML. This was Bob's first meeting for some years, as most of his time has been spent away on active service. In addressing the meeting Bob expressed his views on the subject of post-war planning, and his comments gave rise to a motion requesting Council to go more thoroughly into the matter of post-war activities. It is hoped that Wing Commander Cunningham's comments will be put into writing and published in the Magazine.

The next meeting of the Division will be held on Tuesday November 7th. Meetings of late have been very interesting as Mr. C. C. Quin VK3WQ has and will be demonstrating test equipment.

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Members and Amateurs in
general are reminded that
the Radio Inspector should
be advised of any change
of address.

Also notify your Divisional
Secretary.

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of Great Britain**

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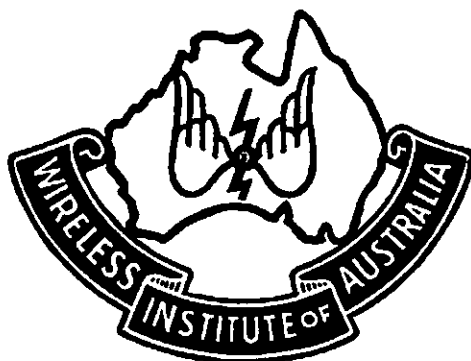
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SIXPENCE

NOVEMBER 1944

AMATEUR RADIO

THE
OFFICIAL ORGAN
OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA



Published by the Victorian Division

AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol. 12 No 11.

November, 1944.

FREQUENCIES FOR TELEVISION

A point which has lately been under a considerable amount of discussion is the choice of frequencies on which post war television services should operate. This involves some consideration of the factors affecting wave propagation at different frequencies. Of course there may be many matters of political or economic urgency which may outweigh technical considerations, but in this article we are only concerned with the latter.

LONG OR SHORT RANGE TELEVISION? .. In the first place, because of band width required for television there seems to be no question that the right place to work is on the ultra-high frequencies. Formerly this was thought to be a limitation as it seemed that range would be limited to the optical horizon. It has since been shown however that the effects of diffraction and of tropospheric refraction were such as to give quite economic ranges. The question still remains, however, as to the best frequency range to be used. We must still decide what range we require from a television service, that is, do we require long-distance television service using the ionosphere as a transmission medium, or should the service be relatively local. It appears at present, as though we must decide on the latter system, mainly due to the relative instability of the ionosphere as a transmission medium and the resulting distortion this would cause in a received picture.

We shall, then, in this article discard the idea of using the ionosphere for transmission and visualise the use of only "local service" transmitters.

FIRST CONSIDERATIONS .. If we wish to confine the service area of our television transmitter to a "local" region it is important that we work on frequencies which are above the MUF of the regular ionosphere layers at every season and time of the day, and at every epoch of the sunspot cycle. It might seem that we could suppress the upward-going radiation and use only a ground wave but we must remember that a wave taking off at a very small angle to the horizontal can reach the ionosphere and be returned to earth at a distant point. If we attempted to avoid this we should probably ruin reception within the true service area. If sufficiently high frequencies are used, however, this trouble is avoided and likewise

interference with similar television services situated some distance away. It is interesting to note that the British television transmissions in previous years were received in several places in the USA.

What then are the highest frequencies likely to be subject to ionosphere refraction at any time during the sunspot cycle? If we know this we have taken the first step towards the location of the ideal frequency bands for television.

EXPERIMENTAL EVIDENCE .. Firstly we have the experimental evidence already referred to, i.e. the reception of the London television signals in the U.S.A. This reception was only possible during winter months and it will be remembered that it is during winter that the daytime ionisation is highest. The conclusion is that during the summer months the ionisation of the refracting layers was never high enough to support propagation on these frequencies.

The pre-war television channels used for the British station situated at the Alexander Palace were 45 Mc/s for vision and 41.5 Mc/s for sound. The results of several years trial on these frequencies appear to indicate that 41.5 Mc/s would only be likely to be propagated by the ionosphere during the winter of years near the sunspot maximum, and that 45 Mc/s would be very near the extreme high limit for such propagation even at that time.

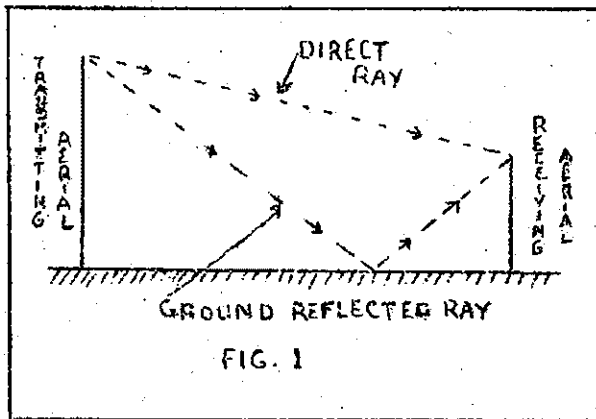
Data obtained from ionosphere measurements recorded at Washington appear to indicate that frequencies from 50 Mc/s upwards would not be propagated by the ionosphere even during winter day-time at the sunspot maximum, and to show that 50 Mc/s would be a fairly safe low limit to the frequency band suitable for television. It can be seen that this conclusion agrees fairly well with the experimental evidence.

By avoiding frequencies lower than 50 Mc/s, then, we could hope to avoid propagation to long distances by any of the regular ionosphere layers at any time. But there remains the phenomenon of sporadic E to be considered, i.e. the thin, highly ionised patches which sometimes appear within the E layer. These can, because of the relatively small height at which they lie, return waves to earth of frequency sometimes as high as 75 Mc/s, and these waves may be returned at distances up to 2000 kilometres with a single reflection. However, although occasional propagation out to 2000 kilometres would thus occur by way of this medium, it is unlikely that the sporadic E would be so widely distributed as to render possible a second hop. So that the chances of interfering with other television services beyond 2000 kilometres distant on a frequency of 50 Mc/s appear to be extremely remote.

REFRACTION OF THE SPACE WAVE .. We may now examine another interesting matter in connection with the propagation of the ultra high frequencies, which will be of some importance in television. It has already been said that the range of a television station is not limited to the optical horizon but due to diffraction etc., it is extended considerably farther. But

it has been found that the field strength beyond the optical horizon is greater than can be attributed to the effects of diffraction alone, and furthermore that the signals at these distances are subject to fading. This points to the presence of a refracted component in the received field, and this is indeed the case. The refraction is not due to any ionisation in the air however, but occurs in the troposphere where air density is comparatively high and free electrons cannot exist for any length of time. There are two distinct cases in which we may have the radiated energy returned from within the troposphere--a normal and an abnormal condition.

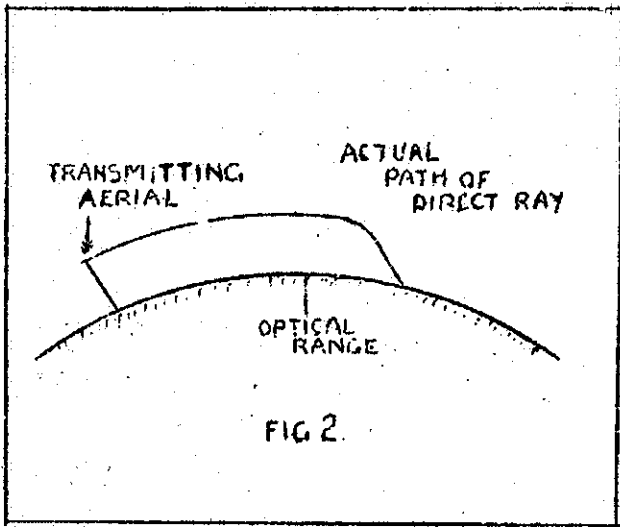
To take the first case first. It should be appreciated that on ultra-high frequencies the actual "surface" wave, i.e. the wave that travels along the ground itself, is not of much importance. What produces most of the received field is that part of the ground wave known as the "space" wave. This consists of two components .. a directly received ray and a ray received by reflection from the ground. The most important component is the directly received ray. These factors are illustrated in Fig. 1.



The directly received ray is shown as travelling in a straight line between the two aerials. Under such conditions it would soon be intercepted by the bulge in the earth's surface due to its curvature, and it will, therefore, not affect any receiving aerial which is beyond the optical horizon. But these aerials do pick up energy from the direct ray, and they are able to do so because the ray can travel, not in a straight line, but in a continuously curving

path. This is brought about by the fact that the refractive index of the troposphere is not constant, but decreases with increasing height. This is due to the normal decrease of atmospheric pressure of temperature and of water vapour content with height.

So the rays which leave the transmitting aerial at small angles to the horizontal are subject to constant refraction and travel in the form of an arc, so that they can reach the earth again at points beyond the line of sight. Fig. 2 illustrates the sort of conditions under which the direct ray may travel. The top of the trajectory made by such a ray may vary between a few hundreds and a few thousands of feet, depending on the distance from the transmitter at which it returns to earth, but it would appear that in the stratosphere (33,000 ft) such refraction would be insufficient to return the ray to earth.



The extension of the range of a station by the effects is fortunate provided it does not introduce any ill effects as well. Experience has shown that on frequencies of from 40 to 50 Mc/s a considerable amount of refraction of the direct ray does take place, giving good reception of signals up to about $1\frac{1}{2}$ times the optical range. As to disadvantages, it will be appreciated that the refraction will vary according to conditions and will consequently cause some fading. It is of a slow type, however, and generally speaking it is quite tolerable on a television signal.

ATMOSPHERIC DISCONTINUITIES .. The second case of return of energy from the troposphere...the abnormal condition--it is brought about by the presence of atmospheric discontinuities, eg. unusual temperature and humidity conditions. Such discontinuities give rise to reflection of waves of ultra high frequency, and rays which leave the aerial at relatively large angles to the horizontal may be returned to earth by this means. The discontinuities usually occur at small heights above the ground and may lead to a fairly severe form of fast fading, thus causing distortion to the received picture.

CONCLUSION ... It would seem then that frequencies from 50 Mc/s upwards would be most suitable for television services and that reception at distances considerable beyond the optical range could be expected. Of course, the upper limit suggested would be greatly exceeded if it were decided to use a system of transmission requiring a very much wider frequency band than that of the pre-war standard.

Finally, the upper limit would probably also be affected by another consideration--the reflection of waves from large buildings and hills. In built-up areas waves may be reflected from large buildings so as to produce a number of different paths between the transmitter and the receiver and in consequence some distortion may be caused. This kind of distortion is likely to increase with frequency, because the shorter the wavelength, the smaller is the surface that acts as an efficient reflector.

From an article in "Wireless World."

.....000.....

Be loyal to your organisation and help them plan the post war Amateur Radio activities....Encourage non-members to join the Wireless Institute of Australia .

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CHINA AMATEUR RADIO LEAGUE

ANNUAL MEETING.

Members of the China Amateur Radio League gathered at the auditorium of the Central Headquarters of the San Min Chu I Youth Corps at 10 a.m. on May 5th of this year for the opening ceremony of the fifth annual meeting of the Association. The branches of the said League held meetings in different places of China simultaneously and communicated from one another through radio waves.

Correspondence, photos as well as radio sets of amateur radio circles in various countries were exhibited at the same time. Mr. Chu Ge Tsing, the vice-president, reported the general condition of the League. After that Mr. Zee Yu-ling, one of the members, read his thesis on "Studies on Frequency Modulation." Both speech and report had been broadcast to the various branches.

An opening address made by Dr. Hsu Un Tseng, vice minister of communications, took place at 3 p.m. of the same date. He being the president of the League, declared that the League has three principal objectives - (1) to train radio personnel, (2) to promote science contributory to national defence, and (3) to cultivate friendship with other nations by radio. Followed by a speech delivered by Mr. Chu Ge Tsing who suggested (1) to start a publication (2) to open a training class where practical lessons will be taught. Other speakers included Prof. Fred O. McMillen, Messrs. Glen Alkinn and Joan Sijder, radio experts of the American Embassy, Mr. HU Shu-hua, Deputy Secretary General of the Central Headquarter of the San Min Chu I Youth Corps.

The demonstration of television was taken place at 5 p.m. Mr. George Bailey, president of the American Amateur Radio League, and Mr. K. B. Warner from Washington, KWL, broadcast special programme. Although we could not hear clearly due to the disturbances in the air, we appreciate the good will of our friends just the same. A radio programme then was given by the branches of the League at Lanchow, Kweichow and other cities.

After a few days Mr. Hsu Un Tseng, the president of the League broadcast through the International Radio Station of the Central Government of China to the president of the ARRL of U.S.A. to express gratitude for his kindness.

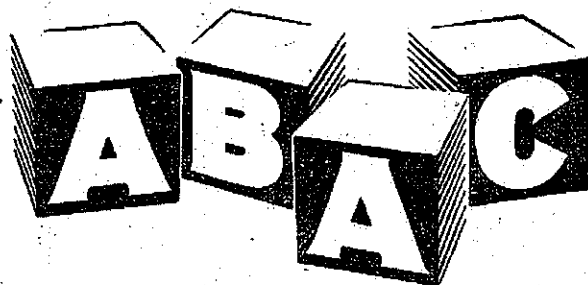
...oOo...

Readers of AMATEUR RADIO will notice that from last month's issue new advertisements have appeared. The goodwill gesture of the three firms, Messrs. Cliff and Bunting, Kingsley Radio Pty. Ltd., and J. E. McGrath will ensure the future publication of the Magazine. Remember these advertisers when the time comes to think about rebuilding your Ham Station.

---oOo---

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AMATEUR TEST EQUIPMENT REQUIREMENTS

Charles C. Guin .. VK3WQ

.....

In the two previous months it will be seen that a means is available to progressively check components before assembling into the apparatus under construction, and then, when this is completed, to give a rough check as to its operation.

If a receiver was the main bone of contention then the multi-vibrator would not be sufficient to 'line up', so of course the obvious next requirement is a signal which is capable of being varied in intensity and also of being set at a frequency and left there.

Many oscillators and frequency meters have been described from time to time in most of the radio publications. One that seems to be coming to and fore is the TRANSITRON OSCILLATOR.

This type of oscillator has been found very stable and because of the coil being 'straight' (no taps) it lends itself to easy construction. Once again we can get away with using one tube only although a buffer stage would be advisable in order to isolate the output of the oscillator, at the same time providing a means of varying the depth of modulation.

Following is a circuit in Fig. 1 which should need no explanation beyond the fact that the accuracy to which it will be expected to

attain is of course governed by the quality of the parts used and also the layout and construction of the finished job.

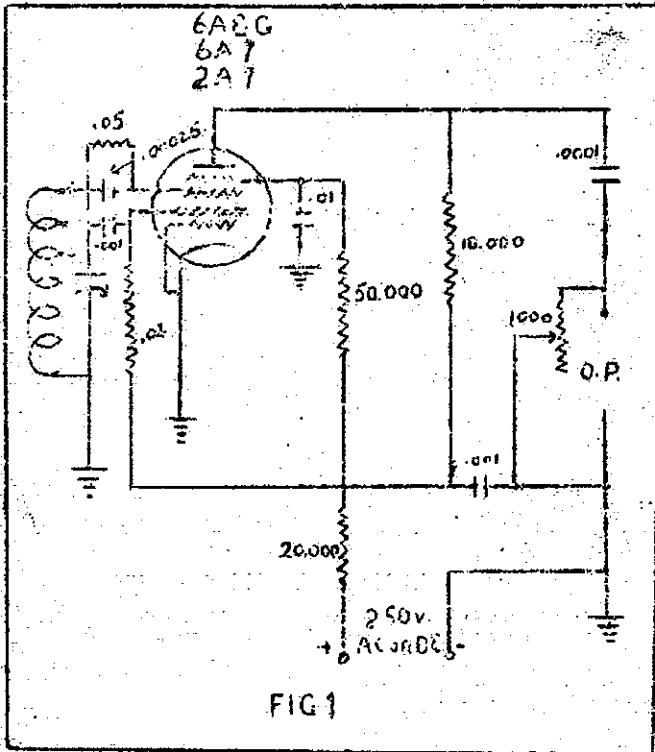


FIG 1

The transitron oscillator works on the simple principle of producing negative resistance between two grid circuits containing the frequency determining constants and is a very big improvement on the once renowned dynatron oscillator which gave such good results.

For the transitron, figures have been quoted to show that for a change of 25% in plate voltage, the frequency of oscillation will change only a few parts in a million. Although the circuit given here shows it for use as an RF oscillator, the transitron can be used for quite a number of jobs.

- (1) Producing Saw Tooth Wave form isosceles to other saw tooth shapes.
- (2) Sine Waves
- (3) Square Waves
- (4) Pulse Waves (developed from 3)
- (5) Selective Audio Amplifier.

The actual frequency range on audio is of course determined by the circuit constants, and, to a certain extent the characteristics of the individual tubes used. This range is from approximately a few cycles a second to 0.5 megacycles.

Naturally such claims must be regarded with care as also the circuit design. Operating over such a wide range naturally with one tube will cause serious attenuation of output and a future article will be prepared dealing with this subject.

Fig. 2 gives the circuit of a practical saw tooth oscillator for production of waves between 7 and 26 KC.

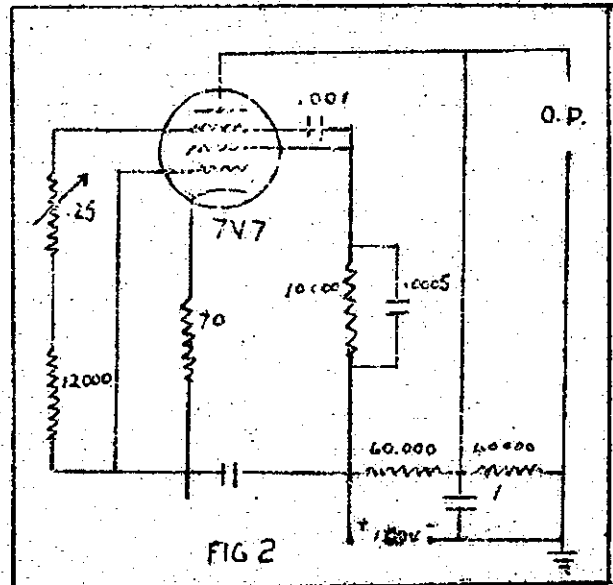


FIG 2

(Continued on page 16)

THE TECHNICAL LIBRARY

This feature has been on the shelf for some time now, owing to lack of space, but the rush being over we are now able to resume.

MATHEMATICS OF RADIO COMMUNICATIONS..T.J.Wang (New York) 1944.
371 pages 25/6

A very interesting book and one which should have a definite place on the Technical Bookshelf. It is divided into eight sections under the following headings:- Fundamental Processes, Laboratory Practice, Basic Circuit Maths, Introductory Maths of AC, Vector Methods, Miscellaneous Useful Communications Tools and Concepts, Advanced Studies, and Graphs for Reference.

The whole subject is treated thoroughly, from simple addition to differential equations and Fourier Series, and each operation is explained in such a way as to suggest its applications to communications engineering.

The first five sections deal with such topics as Arithmetical Operations, Simple Equations, Graphs, Algebraic Operations, Quadratic and Simultaneous Equations, Trig Functions, Radian Measure, Solutions of Triangles, Vectors and Rotating Vectors.

The initial part of the subject before passing to Advanced Studies is completed by the section headed Miscellaneous Useful Communication Tools and Concepts which covers Logarithms, the Slide Rule, Natural Logarithms and Trig Identities.

Under the General heading of Advanced Studies are included such matters as Power Functions and Exponential Functions, Differentiation and Derivatives, Empirical Formulas, Expansions, Integration and Fourier Series.

Mr. Wang winds up a splendid book with the final section covering various reference graphs including those in both rectangular and polar co-ordinates and nomographs. This is a book which can be earnestly recommended both to those who are mathematically inclined and to those who would like to be and are not sure where to start.

.....

Some time ago, in our first review, we devoted considerable space to the Radio Amateurs Handbook, published by the RSGB. A supplement to the Handbook is now available under the title of:-

RADIO HANDBOOK SUPPLEMENT (148 pages) 4/8

This little book contains most of the odd items which are not usually found in Amateurs Handbooks, such as Radio Maths., Circuit Maths, Radio MP, MF Plotting, Emergency Operation of Radio Equipment, and various tables of Logs and Antilogs, Trig Functions and Data and Formulae. Solutions to the various problems included in the text are printed in the final section. There are also chapters on Radio Fundamentals & the OR scope & a chap. entitled "A Service Operators Vade Mecum" which despite its highbrow title is perhaps the most interesting in the book, describing how such things as carbon resistors may be repaired in the field and how operating conditions & characteristics of enemy gear including tubes may be determined with the simplest test equipment. Don't let that title put you off, the rest of the book is in ENGLISH.

SLOUGH MATS and FORAGE CAPS

November...nearly Christmas...and just time for you all to send in a bumper list of notes for our December and New Year Issues...so, all of you, from the laziest "downwards" .. four to six lines from every ham on service. Now, don't believe for a moment any single one of you that nobody is interested where you are...every other ham you have worked with is perhaps often wondering what has happened to you. Or even more likely...you imagine that you are the only ham in some godforsaken area...nobody's lot is as bad as yours - you haven't had leave in ages .. if only there was a ham about, but no, you are the only one within hundreds of miles...AND, as has already happened, not far at all from you is yet another VK or a W who has all your ideas, etc. etc. Both of you read Amateur Radio, but neither has as yet sent in their whereabouts. The moral is ... send in some notes.

Morrie Meyers VK2VF, Group 493 RAAF Pacific, still continues upwards in rank and now is a Wing Commander .. very fb, om. Believe it or not Morrie wants RAAF up his way... says the MST is frightful. Well, well, I thought it did nothing but rain, Hi! But they have steak up where he is and that to anybody in Sydney is reason enough for going there, after a week's strike and not even a chop.

Morrie's right hand man is on 7LA way back in the 120s...and still as much of a Ham at heart as ever. Basil Dale 9XX...Flying Officer to you, is also in 493, but just about due for a trip South after a very lengthy spell up North. A new arrival up there is Fl Lt. Ross Harris VK5ML and also W/O Johnson VK3YF. Another ham in the team is a VK2 Jack Ivana 2CX. So they can just about hold a Hamfest when they take in all the W's that Morrie says are up that way.

For about the third time VK2ABM LS/LEO Reg Morgan EMAS Gessnock turns in some notes. Considering they always have to come just about half way round the world this lad appeals to me as an example of "a great help" to the column. Last time he was in the Med., but now he is recovering from overwork after an appendix op., and doing the job in style in Br East Africa . Hi! He mentions meeting Lincoln King ZS2BZ who wants VK for his WAG. Reg says he was made very welcome and will always have happy memories of the true Ham Spirit shown him there. Another S. African Ham he met was ZS2BJ with whom he had a long rag chew also. So it looks as if a Ham is a Ham, no matter how far from home, and always more than welcome at the home of almost every other Ham that pounds a key. VK2ABM wants his 73s sent to the "Red Headed Sailor", Syd Clark, and also to Ken Bracken 2FF, ...says how's the family Kon .. he has one jnr. op now.

Had a visit here from W4HYO, Stan Pierce. Maybe some of you Newcastle Hams will see something of him as his ship was damaged in a collision and will be up there while being repaired. Stan has been over to England a few times and has good stories to tell. Any of you that can contact him will have a good night. He is a Lt.

in Merchant Marine (served time in Navy before the War) and 2nd in charge of the engine room hails from Patona Beach, Florida.

A visitor at the last WIA Meeting in Sydney was Ern Cook VK3EC who no longer needs to know how many hams were near him in Darwin as he has at long last been moved Southward after being there since the blitz. "Amateur Radio" has been of assistance to him. Apart from the number of Hams OUR COLUMN was able to tell him who were near him, he found it useful once in another way. Ern was having a sojourn in Hospital and had struck up a friendship with the chap in the next bed. One day Ern's "A.R." arrived and he was lying reading it. Suddenly the chap in the next bed said .. "I say, are you a HAM??... so am I...." and the rest of the story is "the same old tale" .. but Ern is sold on the usefulness of our HAM Magazine.

Yeoman of Signals Jack Lumsdaine VK2ABQ is on leave in VIS during the refitting "of a certain ship in a certain port" .. and I reckon that sentence befits the "silent service," Hi!

Mlt. Sargeant Cec. Light in England is now flying Sterling bombers. Cec says he likes English Planes and Radio Equipment in preference to American, and including "Hammarlund & National"...and that's saying something ... and how!!!

Sgt. Clarry Castles Group 160 RAAF Darwin is (or was) way out in the never never and letters would be appreciated. He is now doing maintenance work and looks like resting in one place for a while after much moving round. He sends 83's to Ray Carter and reminds him of that first course together. Hi!

Fred Lubach VK4RF comes to light from Townsville...he wants to know what has happened to the lads at Canberra???? Fred has just completed a nine tube super...now WHERE did he get those parts... certainly not in Sydney.

Looking through my notes I find one from V/O Jack Evans 2CX mentioned by Morrie, and boy oh boy, listen to this bit...Gordon Williamson VK3GF captured a Jap Radio Station intact, but had to put all the equipment into a pool of examination with the promise that after examination will be forwarded to our homes...now take a breath all ye Hams...6 receivers, FOUR 600 watt transmitters, EIGHT transmitters and much beautiful equipment,"...well, well ... I can only hope none of those Examiners are Hams, oms. Hi!

P;O Tel. Syd Clark is now in Madang and still meeting Hams...We mostly. He says W6TP is back in N.G. again after his Home Leave. This W has just about circumnavigated Australia before going Home and his VK Ham total must be pretty large. Syd's latest relaxation is sailing and he reports having graduated from Lakatoi to canvas sail boat, hi!

W/O Con Bischoff 2LZ Group 468 RAAF Townsville (N.B. Fred) is becoming interested in telescopes and stars, as his relaxation. He says he expects AA to arrive in the near future to take over

NEW SOUTH WALES DIVISION

The October General Meeting was held at Y.M.C.A. Buildings and the Chairman in declaring the Meeting open extended a welcome to Fl. Sgt. Ern Cook VK3EC.

Members were given a resume of Civil Defence activities and a ll present were of the opinion that at last the value of the Amateur was realised.

Congratulations to our new Secretary upon becoming a father. ZLO's wife recently presented him with a son and already Chas. is looking forward to the day when Father and Son will be working the rig. In the meantime he had better learn all he can about "y" beams and folded arrays!

The question of entertaining British Amateurs when they arrive was discussed at some length and an appeal was made for volunteers willing to help. According to press reports it can be confidently expected that we will have an influx of British troops very soon and naturally there will be a number of hams with them. Any VK2 Experimenter willing to assist in their entertainment is asked to contact either the Chairman or the Secretary.

Next month is December. In December 1943 a "pound Night" under the direction of "Russ" Miller took the place of the Monthly General Meeting and was voted 100% successful. Council are considering repeating this function and would like to have the views of all city and suburban members.

Members were informed that the Magazine Committee had been successful in obtaining sufficient advertising to make the magazine a paying proposition, thus relieving the burden on both Divisions. It was decided that a letter be written congratulating them upon their efforts.

Upon conclusion of General Business a very interesting talk was given by Mr. Alex Borlan ex-Pt upon his experiences in radio prior to 1914 and during the last war. Alex served with No. 1 A.F.S. in Mesopotamia during the last war and his experiences were very interesting particularly with reference to "pack sets." This talk was accompanied by a display of photographs taken by the speaker. Upon conclusion a very hearty vote of thanks was accorded the speaker.

A letter from Federal Headquarters giving a resume of Experimental activities over the past six months was discussed at some length and whilst commending P.E.O. for their work it was felt that it could have been made much easier if just a little more co-operation had been received from some States.

Fl. Sgt. Ern Cook gave a brief description of his travels with the R.A.A.F. and was pleased to meet ZYC and express to him his appreciation of "Slouch Hats and Forage Caps."

The next meeting of the Division will be held on Thursday 16th November, and an invitation is extended to any amateur to be in attendance.

CIVIL DEFENCE IN THE SOUTH WALES

BUSHFIRES - During the past few weeks considerable progress has been made with the organisation of this All Amateur Network. The most important development was the decision made by the B.A.C. regarding the location of the first three Nets. This honor has fallen to Young, Tubbo and Wagga. The frequency to be used will be 3.1 mc. This has been made possible by the generous action of the Department of W.S.S. who agreed to share this frequency.

Circuit diagrams have been drawn up and these have been forwarded to the towns concerned. As each month passes, more and more towns will be brought into the scheme, so if you don't happen to live in Young Tubbo or Wagga don't be disappointed, your turn will come.

Incidentally quite a deal of publicity has been accorded the scheme over the National Stations as it was mentioned during the evening news session several times and the local press has also given it a boost.

As far as organisation is concerned each town will be an entirely independent unit under the supervision of a Radio Section Leader. The Section Leader will be responsible for the maintenance of the Radio equipment and will take his orders from the Captain of the Bushfire Brigade. Each town will have at least one Radio Unit and each unit will comprise one Mobile Station to act as the Forward Base and three Portable Stations to act as Advance Parties. The Mobile Station will be mounted in a Truck or some other form of transport and will get as close to the fire as facilities permit. It will then be the duty of the Advance Party to get as close to the seat of the fire as possible and set up communication with the Forward Base.

From the foregoing it is quite evident that once operating personnel and equipment are more easily obtainable, the scheme can be very easily expanded.

Mr. W. P. Mickson VK2AP5 has been appointed Technical Officer and all enquiries re equipment should be addressed to him at Bastable Street, Croydon.

Remember chaps if you are not already participating in the scheme, your turn will come.

EMERGENCY COMMUNICATION NETWORK. This Net continues to function twice a month and the quick and accurate manner in which messages are handled reflects great credit on the operators concerned. Recent visitors to Central were astounded at the manner that outlying stations handled traffic, and when informed that the work was being performed by Amateurs, their surprise was manifest.

In recent weeks several changes have been made at Central, the most important being a change in the PA. Previously a pair of 808's were used, but these have gone the way of all tubes, and now a single 813 is feeding the antenna. Of course 221 never ever did believe in "starving the antenna"!

SYDNEY HARBOR PATROL. Recently members of the S.E.P. were instructed to hold themselves in readiness for duty on any night of a certain week. Certain events detrimental to the Nation's war effort were taking place on the waterfront and it was decided that a determined effort be made to eradicate this evil.

The night eventually arrived and "Sea Horse" was a hive of activity. As each launch pulled into the jetty, supplies of fuel and oil were taken on board, and when this operation was completed, the Radio equipment was tested out and the boat stood by for orders from the Flagship.

Soon all craft were ready to proceed to their allotted stations and at 9.23 p.m. "Port" notified Central that she was leaving the Depot. This was quickly followed by the same message from "Moonbi" and in a very short time all boats were on their way to their various stations.

Then for the next few hours the Patrol went about its task of checking various craft on the Harbor and messages were exchanged between ships and Control at a fairly high rate. These told of the highly efficient manner in which the boats were doing their work.

At 11.23 p.m. the following message came through - "Notify C.O. gunfire. Three shots fired from stern of ship moored at ... what are his instructions?" Following on receipt of this message things began to happen. The Harbor became a hive of activity and messages began to flow in an unending stream and in a very short time Speedboats belonging to an Allied Navy were dashing to the spot indicated, followed very soon after by the Police Patrol Launch.

In the meantime other craft continued the work of checking other boats moving about the Harbor and eventually the incident previously reported was cleared up.

The above is a brief account of a Security Patrol carried out by the S.E.P. and was the real thing and not just an exercise. For reasons of security it is not possible to go into more detail, but needless to say communication played a vital part and the amateurs assisting had an exciting but never-the-less exciting night. More amateurs are wanted to act as operators and further information may be obtained from Val Ryan VK2TI, FX3306 or Ray Weingott LA3763.

A week after the above incidents, a cruise was made to the upper reaches of Middle Harbor in order to ascertain signal strengths from various points. This was a most interesting night and quite a deal of valuable information was collected.

So chaps, here is an opportunity to participate in Civil Defence work of real value to the nation, both in peace and war.

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VICTORIAN DIVISION

As a result of the discussion at the last general meeting in reference to the Post War Amateur Radio Activities, Council at its last meeting spent some time in discussing the matter, and felt that the time was ripe to make some definite steps to draw up the ideas of this Division, so that they may be passed on to Federal Headquarters, who will when all relevant information on the subject are to hand, draw up the final plan for the Post War Amateur Radio Activities. Individual members can help considerably by forwarding their ideas to their respective Divisions. To facilitate this Division's planning Council appointed three members to act as a sub-committee, whose duties will be to present ideas for discussion and to note the discussion thus filling in the gaps and incorporating everyone's ideas. This committee comprises of Messrs. A. H. Glyne VK3VK; R. Marriott VK3SI and J. K. Ridgway.

The Division's Membership Drive still continues to be a success and this is most gratifying both to Council and to the Membership Co-Secretaries. New members admitted at the last Council Meeting are:- Sgt. J. A. Cusick VK3MA, South Melbourne; S/Sgt. P.S. Hanham VK3BF, Essendon; Cpl. P. R. Gibson, VK3GX Camberwell; P/O H.F. Juch VK3DF East St. Kilda; S/Sgt. W. T. Walker VK3WV, Camberwell; J. P. Sydor VK3JX Ha milton; A. H. Bowley VK3AF Asburton; L.E.Hale VK3ED Ballarat; R. Russell VK3BO Coburg; R. Bowling VK3X North Fitzroy; W.A. Brownbill VK3BU Geelong; E.E.J. Phillips VK3JU Sth; Yarra, T. M. Palmer, Colac. It is proposed that as new members are admitted to membership their names will be published in this magazine.

Members of this Division and in fact all readers of the Magazine will be pleased to hear that the former Chief Inspector of Wireless, Mr. J. Malone, has been appointed to the position of Deputy Chief of posts and Telegraphs in New South Wales.

The Laboratory Committee still continue to meet every Tuesday night, with exception of the Meeting Night and Council Meeting. Their activities of late have been mainly concerned with putting the Receiver back into operation. Unfortunately a number of tubes are missing, and sundry tubes were borrowed in order to find out how it functions. From reports, receiving conditions at the Rooms are at the present excellent. This is accounted for by the lack of neon signs about the city which were in pre-war days the main source of noise.

The next meeting of the Division will be on Tuesday November 7th. The December meeting will be on Tuesday, 5th December. At both meetings Mr. C. C. Quin VK3TO will continue his series of lectures on Amateur Test Equipment. He has hopes of obtaining the use of a Cathode Ray Oscilloscope to use in conjunction with some of the test equipment. This demonstration should prove very interesting.

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The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and on invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

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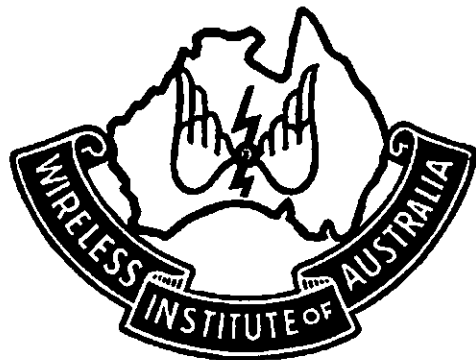
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DECEMBER 1944

AMATEUR RADIO

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AMATEUR-RADIO

INCORPORATING THE N.S.W. DIVISIONAL BULLETIN

Vol. 12 No. 12

December, 1944.

FROM THE EDITOR'S PEN.

December issue of Amateur Radio means that another year has almost reached its end - a year in which Amateur Radio throughout the Allied World has added more and more record to its already full page of National Service.

We, the Wireless Institute of Australia in looking back can be justly proud of our record during the past year - in fact our achievements since the outbreak of war would not be surpassed by any other nation.

In review we see during the first years of the war the rallying to the Colours of the Hams, who due to their amateur activities were able to fill specialised jobs in Army, Navy and Air Force - jobs which would have taken the Services years to train men. The value of the Ham is proved conclusively by the high ranking positions held by Hams in the Services to-day.

Japan entered the conflict and moved closer and closer to our shores - the New South Wales Government were quick to see the advantage of incorporating the Ham into its civilian services, and so was born the Emergency Communication Network - we believe the first ever to be recognised by any Government in the world. From this beginning the Ham activity in N.S.W. has spread to the Sydney Harbour Patrol, and the most recent application of the Ham is to the establishment of a Bush Fires Net.

Governments in South Australia, Western Australia, and Tasmania also saw the value of the Ham for Civilian Defence, as is witnessed by the establishment of A.R.P. Communication Nets.

In Victoria however, no authority could be obtained for the establishing of a Communication network, but due to the ground work put into endeavouring to establish one, that Division in conjunction with the Forests Commission of Victoria have every hope in building a permanent Emergency Communication Organisation.

The Wireless Institute of Australia is as strong, if not stronger today than it ever has been, membership is on the increase and in fact rapidly approaches any prewar peak.

-----OOO-----

AMATEUR TEST EQUIPMENT REQUIREMENTS

Charles C. Quin...VK3WQ

...

Before going ahead with this month's article it would be as well if a few remarks were made regarding queries from previous installments.

OCTOBER - Since writing the article on the Bridge, it was asked if any other tube could be used in place of those mentioned as none of them are obtainable in Melbourne at the present time. A 6G5 was then tried, but as expected, it was not quite as sensitive as the 6ML, good indication could be observed for fairly large differences of comparison. However poor power factor of the smaller capacities could not be noticed the same as with the 6ML..the 6G5 could give good results if the operator was patient. (Note: 1 of uses should have been "using terminals 4 and 5 and 6 and 7"; the terminals 5 and 6 are joined by the selector switch and form a 'centre-tap'.

NOVEMBER - It would be as well to mention that the principle of the Transatron is that of producing negative resistance between two grids in the case of Fig. 2 they would be suppressor and screen, and between suppressor and screen and grid and plate of oscillator in Fig. 1.

It has been queried if 25% variation of the plate voltage is correct. Tests have found it to be so.

It will be seen from the circuits shown in November issue that two different types of tubes are used .. Fig. 1 pentagrid, and Fig. 2 penthode.

In the pentagrid type the plate terminal serves as a means of taking the output only, but the pentode type plate is also part of the oscillator circuit, therefore greater care must be taken in loading this circuit.

The 7V7 type is not available in quantity to civilians in Australia and characteristics are not generally known - although the 'Radiotron' equivalent Chart shows the 6J7G as 'having electrical differences and base differences.' The following will show that they are entirely different.

Type	Plate V	Plate I	Screen V	Screen I	AC Plate Resistance	Trans-conductance.
7V7	300	9.6	150	3.9	300,000	5800
6J7G	250	2.0	100	0.5	Over 1 meg	1225

In the case of the 7V7 a bias resistor of 160 ohms is required whereas the bias for the 6J7G is given as a negative 3 volts.

One of the members at last month's talk intimated that a 6U7G had been used for this particular application, and if anyone is interested, details will be ascertained and published. See also October 1943 Amateur Radio.

Further to Fig 2. Three omissions are evident here:- they are -
Line at bottom of 70 ohm resistor should show earth or chassis
connection while adjacent condenser is 0.5. Plate supply is 150 volts.

DECEMBER ... The promised description of a signal tracer (actually
the circuit diagrams and explanatory text) will have
to be held over until a later date. However in the meantime you
are recommended to read that excellent article by VK2WX in February
and March 1944 Amateur Radio.

INDICATING DEVICES

V.T.V.M -- Here again you are referred to previous articles in "AR"
the most recent being November to January last by VK3VX
and a wide choice is given. No particular one is pointed out be-
cause each Ham has his own 'pet' ideas, and available gear.

UNIVERSAL METERS - Hundreds of articles have been prepared on "Multi-
meters" and Ohmmeters and it would be safe to say
that no ham shack is complete without one of these instruments. It
would also be safe to say that you would already be in possession of
one.

It is well to mention here that care must be taken to apply
each of the above mentioned type of meter to its appropriate measure-
ments; that is for example -

You want to measure the negative bias voltage on the grid of a
valve under actual working conditions. The obvious way is to apply
an accurate multimeter to the cathode resistor, select the voltage
range, and read the indicated figure -- but wait -- if for instance
you have the instrument set to read 10 volts full scale, and the
assumed voltage is 10 volts across the resistor (Meter also assumed
1000 ohms per volt) then 0.95 milliamperes is consined by the meter
and associated resistor (being in parallel with the bias) and the
meter will indicate say 9.5 volts. Larger discrepancies occur in
lower current circuits.

You will say that such accuracy is not necessary for amateur
requirements, but this example is only one - what about measuring
AVC where high resistive circuits are employed? It is here that a
VTVM must be used so that little or no current is taken from the
circuit under test.

As regards the ohmmeter portion of the meter. Here you are
referred to the bridge at the beginning of the article. After use
of the bridge you will rely on an ohmmeter merely to indicate
shorts or open circuited components.

J. E. Potts in an article in October 1943 Amateur Radio gives
practical circuits for Electronic Voltmeters.

MAGIC EYE -- The 'magic eye' type of indicator has been used in all types of apparatus, and is less expensive than a meter with the added advantage that, within reason, it cannot be overloaded like the defunct meter with the bent needle.

December 1941 gave a circuit of a wide range tuning indicator with from almost zero to 220 volts operating range - this with the addition of a few components and circuit will be given later.

A later article will also give details of the use of this type of indicator in calibrating audio frequency oscillators so that the desired frequency can be accurately 'aligned' to that of the standard available.

The value of the magic eye as an INDICATOR cannot be overstressed.

OSCILLOSCOPE - Here again many articles have appeared on oscilloscopes, but none in 'Amateur Radio.' It is not intended to give an example in this present series, as CRO tubes are not available at present. Immediately the conditions warrant, an article will be prepared on a simple 'scope. Suffice to say that this type of indicator is the 'ultimate' as it indicates simultaneously, if necessary, the magnitude, form, phase and frequency of the wave or voltage being measured; whereas each of the other types considered indicate magnitude only.

VALVE TESTS - Most of us are aware that the commercial valve tester is only an emission test, this is, the filament is heated to correct temperature, grid voltage applied and varied and all other elements paralleled and the plate current read, which in effect is only an indication of the state of the grid and cathode. Therefore the only real tube test, without complicated apparatus, is to measure with a VTVM the actual applied voltages, and with an accurate milliammeter the actual currents of each element in turn. All these tests to be carried out whilst the valve is in the apparatus, and the readings obtained, compared with the manufacturers figures.

Unfortunately different tube makers sometimes vary the characteristics, (this is seldom) and slight inaccuracies in physical construction may give slightly misleading results. However, for all practical purposes the above mentioned tests should give the required results and a true indication of the state of the tube.

CONCLUSION - From the foregoing articles, it seems that we have quite a "Conglomeration" of apparatus, which is a far cry from the proverbial screwdriver and pair of pliers. Just as in the old days when a peal amp in a turn of wire, and a little common sense was all that was necessary to tune a transmitter, you will find that each piece described has its own use. The line up then is as follows:-
(1) Bridge and indicators. (2) Multivibrator. (3) Oscillator.
(4) Signal Tracer. (5) VTVM. (6) Universal Meter. (7) C.R.O.
(8) Valve tests.

If necessary several of them could be built up as dual units, for instance 1.4.5.6 and 2.3 or 2.3.5. can be combined.

THE TECHNICAL LIBRARY

THE RADIO AMATEUR'S HANDBOOK...A.R.R.L...21st (1944) Ed. 480p..12/6-

The set up and subject matter of the latest ARRL Handbook follows closely the immediately previous editions with minor revisions and additions here and there.

The Handbook is divided into four main sections, including in all 22 chapters. Section one is introductory and covers the nature and history (from the American viewpoint) of Amateur Radio. Section two is titled "Principles and Design" and deals with transmitters, receivers and antennas from first principles. This is followed by Section three - Construction and Data, embracing the practical side and including also such items as Carrier Current, Measuring Equipment, WERS and Workshop Practice. The final Section deals with operating and Traffic Handling.

The large amount of padding which has long been a feature of the ARRL Handbook is still apparent in this addition, in the way of relaying procedure etc; but fortunately this has been included additional to and not at the expense of the technical information.

In the back of the book is the catalogue section which has now reached 174 pages and is almost as interesting as the rest of the book. RADIO HANDBOOK .. 9th Edition (1942) 640 pages .. 16/-

Formerly the Jones Handbook, but now compiled by several authors this edition has been available for some time, but it is considered fitting to mention it in this review with its contemporary.

From a rather haphazard start around 1935 the Radio Handbook has grown from an assorted collection of more or less disjointed paragraphs into an orderly and well presented manual for the Radio Amateur. It is seen from the title page that Mr. Jones has faded out of the picture, and a perusal of the subject matter shows a lack of idiosyncracies and strange ideas, which facts may be, of course, co-incidental.

The material is covered in the course of 28 chapters which deal with all the usual subject matter of interest to the Ham and include special chapters on Transmitter adjustment, C.R. Scopes and BGL interference.

As a reference book for the Ham the Radio Handbook is probably the best buy in the field, and it is interesting to note that this edition although two years old is still ahead of its two contemporaries in its information of VHF and FM; two subjects which have become of top-ranking importance these days.

Now that we have reviewed each of the three leading Handbooks it may be pertinent to state in what respect each outshines the other. Radio Amateur's Handbook A.R.R.L..Antennas..Best handbook for Beginner Radio Handbook...VHF and FM..Best reference Handbook for the Ham. Amateur Radio Handbook. R.S.G.B..Crystal Filters...A useful guide to English Ham practice.

Copies of books supplied by courtesy McGills, Melbourne.

THE SHAPE OF THINGS TO COME

Under the above heading in a recent issue of the "Gramophone" includes some interesting comments regarding the likely post war trends of recording technique. The comments are mainly based on discussion at a recent meeting of the Institution of Electrical Engineers on the merits and demerits of various forms of recording.

Despite the age of the disc system, it offers a great many advantages, being easy to handle, is self-contained and compact, and is fairly easy to process. It was agreed that the main improvements needed for the disc system are better signal to noise ratio, intensity range, frequency range, freedom from non-linear distortion constancy of results and longer playing time.

In pre-war days the normal top frequency limit of records was about 6000 cycles per second, but even this comparatively low limit could seldom be utilized on account of the high surface noise of the discs. The development of cellulose nitrate coated discs, however, has allowed the frequency range to be extended to about 12,000 c/s with at the same time, comparatively low noise level.

Suitable materials for discs were discussed and it was felt that there should be many possibilities among the plastics developed for war-time uses. Primary necessities are cheapness, ultimate strength and stability and easy flow properties in the press. With regard to the use of fillers, it was noted that this practice could be dropped provided that needles complying with rigid specifications could be provided. The present main use of the filler is to grind the points of the variety of types of needles met these days, to a point which will suit the groove shape used.

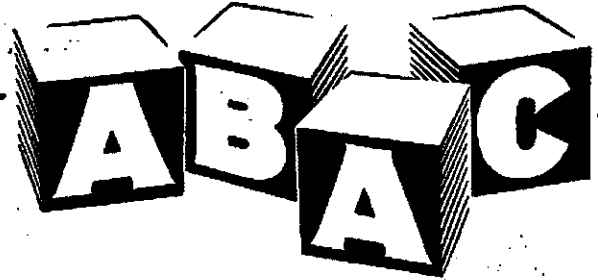
It is noteworthy that the preferred maximum level given for a shellac type disc was plus 25db. The range of most of the shellac type records heard today averages about 37db, whereas with the new records a range of up to 75db can be obtained. This latter figure means that there will be no necessity to employ compression during recording, and in consequence far greater realism should be obtained.

Regarding the optimum groove shape, it was stated that experiments have shown that a groove having a depth of 0.0029 ins., a width of 0.0067 ins. and an included angle of 83 degrees should be used. This automatically fixes the needle shape which should have a hemi-spherical end of 0.0025 in radius and a 30 degree taper. Present needles have points varying from 0.0015 in to 0.0024 in, hence the need for grinding by the filler.

A number of records were played with a very low down thrust type of pick-up and using in the amplifier a filter circuit that enabled the response to be cut at will at 6000, 8000, 10,000 or 12,000 C/s. This demonstration proved only too clearly that we accept very mediocre quality with even the best present day discs which cut off at 6000 C/s.

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A further interesting demonstration was a comparison of disc recording and film recording. The general consensus of opinion was that the disc proved slightly the better, mainly on the score of better transient response.

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NEW SOLDER FLUX.

Fluxing agents such as rosin and zinc chloride have been found unsatisfactory in many applications. While zinc chloride is a powerful flux, it tends to cause corrosion unless the soldered parts are thoroughly washed to remove the excess flux after soldering. Although rosin is free from this fault, it is not sufficiently active when used with such metals as steel. It has been found that lavulinic acid, derived from common starch, is as much more active flux than common rosin. When blended with rosin, this flux can be used in soldering steel parts without the necessity for subsequent washing.

The Magazine Committee desire to extend to all readers Compliments of the Season with their sincere thanks to all who contributed articles during the past year.

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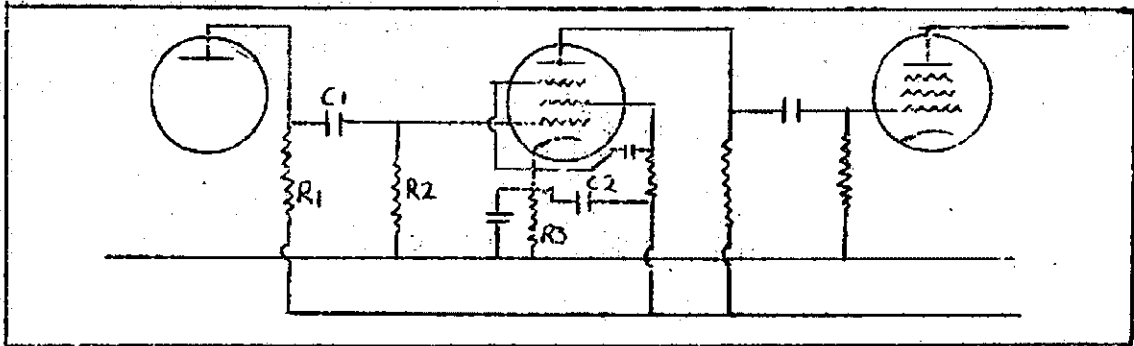
Alec K. Clyne..VK3VX

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One of the difficulties associated with multi-stage, high gain voltage amplifiers in audio work is the pressure of low frequency oscillation, which makes itself apparent in the form of 'motor-boating.' This is caused mainly by the impedance of the power supply as measured across the output terminals of the power pack looking towards the rectifier. Voltages developed across this impedance by the final stage are fed back via the HT leads to preceding stages and bring about oscillation.

Two methods have been employed in the past to combat motor-boating firstly by cutting the low frequency response, which is not always admissable, secondly by the use of decoupling filters, which become less effective the lower the frequency and also do not always achieve the desired result.

A very simple expedient evolved by Wen-Yuan Pan, Assoc I.R.E. is shown in the diagram. The only addition to the usual circuit is the condenser C2 which brings about neutralisation of feed-back



by introducing a voltage across the cathode resistor of the stage which exactly balances out the feed-back voltage appearing on the grid of the same stage due to power supply impedance. For perfect neutralisation the following equations must be satisfied.

R_p is the plate resistance of preceding tube.

The above equations are independent and both must be satisfied. Also it is important to note that neutralisation by this method is independent of frequency, which means that power supply hum is reduced to the same extent as is regeneration since both are caused by undesired voltages appearing across the power supply output impedance.

(Continued on page 16)

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There are times when writing this column is a job for one of these strong silent men, a much stronger man than I ... and these times are when, as at present, only one solitary batch of notes from all the Hams scattered about have arrived, and its time for me to somehow or other write two pages. If it was a waste in War-time I would suggest the Magazine Committee publish two pages adorned with an epitaph and tombstone!!!!

The Magazine staff have given me a little longer to get some notes and the extra time has passed so as they expect "something" here goes.

The red-headed Sailor Syd Clark, the one and only correspondent - again at Lae - his sailing course apparently being over - or because they possibly caught him at his "training" and reckoned there was a war on - hi! Coming back from Madang Syd flew up the Markham Valley and landed on one of the strips at Madzab for breakfast. The last part of the trip Syd. made as a "Combined Operation in a Jeep" with an R.A.A.F. and Army Officer.

Of course there was the "usual Ham" at Lae in the shape of 30T Bob Stevens (he seems to "live" in New Guinea - that chap - 2YC) and Ted Charles a VK5. Most of Syd's Yank Cobbers had moved out and a new crowd had taken over but there are sure to be some Hams among them somewhere.

30F - P/O Tel. Frank O'Dwyer usually works on the bridge of the H.M.A.S. Australia, but it must have been one of the times "he wasn't there" when she was hit. Had a casual letter from him the other day in which he says he "wouldn't have missed the Phillippines for worlds. Well, well, what a taste. As he didn't say GIG was wounded, I guess both our Hams got through OK. Frank - I reckon Wilf. - 2 ALF - is a bit "hey" where these ships are concerned - hi!

Harry Caldecott - VK2A - now an Officer in the Air Training Corps was at our last W.I.A. Meeting. It's quite a long time since he was able to get in to a meeting.

4RF reports - Newly promoted Captain Jack Wooster (4VH) has left his job as R.T.O. at Rockhampton and gone to Thursday Island. Called in at Bowen a while back and met a Ham whose call I think is 6MZ working for the R.A.A.F. Only other Ham here with me now is Tom Shoring - 4SR. Recently seen passing through here - 5MA - Brian Anderson on his way back to Darwin. 4S: - "Chilla" Sharland of little ships is still kicking his heels in South Africa awaiting a transfer back to Australia after being away for almost four years. 4BL having a good time in VIB taking National Relays and recording programmes for Short Wave Transmission to A.S.A. etc. Has just built himself a new super (9 tubes) after hearing 4 RMs!!!

The Victorian President, Herb Stevens recently received a letter from Sgt. Geoff Trythall VK3MA, who at present is a member of one of Australia's Small Ships Coys. To quote from his letter "I received a circular from the WIA a few days ago - apparently it has been travelling for about three or four months. The envelope is covered with addresses. Anyway its something about rejoining the Institute, so am enclosing the wherewithal on the strength of it.

I can't give you much dope about the setup here without breaching the security regulations, but I can say we are stuck up here in this God forsaken hole in Dutch New Guinea - am running a shore station that keeps in touch with our tubs at sea - all QRP stuff - 10 to 20 watts.

I went out on a trip recently and the vessel foundered on a reef was in the water for seven hours before being picked up. I pumped out an SOS on phone and CW until the set gave out - it was heard fortunately - tha t's the first and last SOS I ever want to send out.

There's another Ham in our show, Ken Mathews VK3IG (what about a note from you OM...2YC), he's over at Darwin and have a QSO with him occasionally."

Sometimes Hams, although they have known one another in pre-war days forget what the other looks like, particularly when in uniform. We have a story to relate regarding two well known VK3 Hams. It seems that some big wigs were being conducted on a tour over an Army Signal station ... Wing Commander Bill Gronow 3WG in looking round spotted a humble Sargeant whom he thought he recognised, said Bill, "Haven't I seen you before some place? Weren't you in the RAAF at some time?" "NO," said the Sargeant, "I haven't been in the Air Force, but I was 3WE before the war."

Sgt. Fred Smith 3FR has been spending some time on leave in VIM, and turned up at the last VK3 Meeting. Unfortunately Fred was unable to tell us where he will be going to when he reports back. So Hams anywhere in the Pacific Zone may meet him sometime.

Cpl. Ron Nigginbotham 3RN spends most of his free time these days at AWA. We believe in the persuit of some sort of ticket. Here's the best of luck Ron when the big day comes off.

VK3OC reports receiving a card from Snow Campbell 3MR some weeks ago. According to the information contained therein, Snow is still in the same camp as reported in these pages some time ago. That camp was somewhere near the Polish Border.

VK3HX had a visit from Cpl. Jim Stevens 3ZK last week. 2YC reported a visit by the same chappie to his QRA a couple of months ago. (Readers will note that 2YC is NOT writing this paragraph) Jim 3ZK after that visit is amazed that the populace around 2YC's place of business survive. (We'll see what that brings forth..Ed.) And so chaps that's the lot for this month & if I don't get any letters there will be no notes next month -- Send to J.B. Corbin, 78 Maloney St. Eastlakes..... MUI092

DIVISIONAL NOTES

At the November General Meeting of the Division the Chairman in declaring the Meeting open for General Business extended a welcome to Lieutenant Jack Striker W6MOV, Ed. Foreman VK4GF and Mr. Phil Crocker.

Some discussion took place regarding the location of Federal Headquarters at the present time in view of the rapidly approaching time when it will be necessary to make various representations to the Dept. The Divisional Council were appreciative of the great work carried out by the Executive whilst located in U.S.W. but felt that quite a deal could be accomplished even now for the benefit of Post War Amateur Radio should it be possible for personal contacts to be made. The Federal Secretary stated that the Executive had now completed three years of office in New South Wales. Actually the Headquarters Division was determined by the Annual Convention in pre-war days the only proviso being that it could not be located in any State for more than two years without reference to the States.

The Federal Secretary supported by the Federal Chairman agreed with the VK2 Divisional Council and it was unanimously decided that VK3 be asked to act as Headquarters Division immediately.

During the month a very welcome visitor was Bob Anderson VK3WY, Secretary of the VK3 Division. Bob was given an opportunity of inspecting the Network Control Station and meeting quite a number of VK2's. Quite a number of matters were discussed and it is hoped that this will be the forerunner of many other visits.

Members will regret to learn that both Will Pulkes VK2WD and Les Tanner VK2ABL are both inmates of Sydney Hospital. Both these lads would appreciate a visit from any other amateurs. Visiting hours are between 7 and 8 pm each night whilst it is advisable that you contact the hospital for times during the day.

Mrs. Rita Pagan and Family wish to convey to all Members of the Institute and amateurs generally a message of thanks for all telegrams and messages of sympathy upon the passing of 2RJ.

Upon conclusion of general business a very interesting talk was given by Jack Striker W6MOV on the work that he is doing. Of particular interest was the information purporting to be "straight from the horse's mouth" regarding post war frequencies. We hope you're right Jack, but !

VK4GF told us about ham radio way up North. We understand that he and VK4NF had a flourishing radio business!

The Christmas meeting of the Division will be held at Y.M.C.A. Buildings Room "K" on Thursday 21st December.

The Chairman and Council of the Wireless Institute of Australia, New South Wales Division wish amateurs everywhere the Compliments of the Season.

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BRITISH CENTRE

During the past few years it has been the policy of the New South Wales Division of the Institute to hold a function in aid of various Patriotic Funds. These entertainments have usually taken the form of a Picture Night.

At the 1943 December Meeting another function was inaugurated namely a "Pound Night" each member being asked to bring along something to eat or drink. The whole of the arrangements were under the direction of Mr. Russ Miller and upon conclusion the evening was voted an overwhelming success.

The question of providing funds for British Centre and the Annual Pound Night was discussed at length at the November General Meeting and it was unanimously decided that the Christmas Meeting of the Institute would combine the two functions.

Mr. Morry Lusby VK2VM has just returned to Australia after two years in America and England. Whilst in those countries he made very good use of a Movie Camera. He has very willingly volunteered to screen these films on "British Centre Night." Morry, who has enjoyed the hospitality of English homes, has a very soft spot in his heart for our English cousins, was very pleased to be given the opportunity of making some repayment if only in an indirect way.

Catering arrangements will be in the hands of Russ Miller, and you are asked to contact him either at BW6632 or UJ5912 and let him know what you intend bringing along in the way of eats, or drinks.

An earnest appeal is made to every member of the Institute to be present at this function. Every Australian Amateur worthy of the name is honor bound to make the stay of every British Amateur in this country an enjoyable one. Some of us will be able to take them into our homes. Others through circumstances cannot do this. Here is an opportunity to help indirectly.

Unfortunately it is an English characteristic to belittle ones effort and it is quite safe to say that the Armed Forces of Britain have taken more hard knocks and carried out the most hazardous tasks with as little glamor or self commendation, than any other of the Allied Nations without exception.

An admission charge of 2/- will be made and you may bring along as many friends as you wish. If you cannot attend, why not send along a small donation?

Don't forget, Thursday, 21st December, Room "K" Y.M.A.A Bldgs.

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Official approval has now been granted for the operation of the Bushfires Net in New South Wales. There has been a slight alteration made with respect to the frequency to be used. Previously it was stated that 3.1 mcs would be the frequency but this has now been altered to 3115 kcs.

As mentioned in last issue, Young, Dubbo and Wagga are the three towns selected for initial operation, and at the time of writing Young and Dubbo are racing neck and neck to have the honor of being the first Net to go into operation. Unfortunately Wagga got away to a late start.

As far as equipment is concerned there will be two types of different set-ups. The Truck Set which will be vibrator powered, uses a 6J7 or equivalent type, as a Pierce Crystal Oscillator driving an 807. The P.A. is modulated by a 6J7 driving an 6L3. The Modulator section also acts as the audio output of the receiver. The receiver is a superhet using fixed tuning for the Broadcast band whilst the 3 mc band is covered by a small capacity two gang condenser.

The Pack set uses a P.P. crystal oscillator while a T.R.F. Receiver is used, the audio end acting as modulator.

YOUNG. The gang at Young consists of 2TC, 2TA, and 2YA with Jim Taylor 2TC as Section Leader. These lads have roped in a few more assistants and it won't be long before they are on the air. The liaison between the Radio and the Bushfire Brigade is perfect, reason being that Alan Thackeray VK2TA is Deputy Captain. It would be fitting if Young were to be first on the air as 2TC suggested the idea some few months ago. Since then we've been using a bulldozer to get through the red tape.

DUBBO. In this district Max Moore VK211 is Section Leader ably assisted by Bill Brook VK2ACT and Tom Stroud VK2AMR. Max is very keen and thinks nothing of putting a few trunk calls through to 2TI occasionally. That's the spirit boys, and it is my regret that equipment doesn't come along as quickly as you would like it. This should help. When the B.C.N. was formed permission was granted on 24th July. The first transmission didn't take place until November. Nearly four months. You won't have to wait that long. By the way Bill, how are the bees?

WAGGA. Remember 2YW chaps and the way THEY used to work the PK in the good old days. Well gang Doug 2YW tells me that sister Jess is now the proud mother of two sons. Time marches on! Unfortunately the hams at Wagga other than 2YW lived in other places in 1939 hence Alf Hove 2BY and Roy Heiman 2YI didn't receive the circular or didn't hear about the Bushfires Net until they saw mention of it in the mag. Hence the late start.

With all wartime emergency Nets equipment is the bugbear, and one of the outstanding features of the Bushfires Net to date has been the manner in which the city experimenters have come forward and helped the country boys get going. Splendid ham spirit has been shown.

EMERGENCY COMMUNICATION NETWORK DOINGS.

The burning question at the moment is the identity of the "new" operator at VL2JL. Central were shocked recently when a "strange voice" told them how they should send messages. It is believed that the "Tunner" at Central identified the voice immediately! Ahem!

Network stations still continue to function 100% and "6MOV was quite pleased to have a "ragchew" recently. Well it was quite a change from the kilowatts.

SYDNEY HARBOR PATROL

It is anticipated that two more boats will be operating shortly and this will make exercises more interesting. Practices now take place twice a month when all boats participate. Full information from Mr. Ray Weingott LA 3763.

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VICTORIAN DIVISION

It has been decided that in each month's notes the call signs of those attending the divisional meetings be published, with the view that other members or non-members as the case may be, may perhaps be interested in meeting one particular Ham, and seeing that he attends more or less regularly, a note to the effect that he does so, may induce others to attend the meetings.

At the November meeting those present were:- VK3UQ, VK3FR, VK3RN, VK3IK, VK3OS, VK3BO, VK3KN, VK3OC, VK3SZ, VK3HG, VK3YL, VK3WE, VK3X, VK3EX, VK3NY, VK3JO, VK3TY and Mr. J. K. Ridgway.

In endeavouring to arrange more attractive meetings, Mr. H. Kinnear VK3KN has offered to put on movie shows complete with sound equipment. It is intended that these shows will be as educational as possible as there are quite a few films about which deal with radio and an endeavour is to be made to contact the people responsible in a hope that these films will be made available. An appeal is made to anyone who may have access to this type of film to let this Division know if they can be made available for one or more of these shows. The film required is the 16 mm size with or without sound.

The first of these shows has been arranged for the February meeting which will be held on Tuesday February 6th, and everyone interested is invited to attend. The popularity of these shows will depend on the number held, so it is up to members to show their appreciation of the offer to roll up in vast numbers.

The hopes of this Division establishing an Emergency Communications Net in conjunction with the Forests Commission is still fully maintained, as the first station is now receiving consideration of the authorities. The result of the circular was perhaps disappointing

but nevertheless the information gained was of utmost value. Unfortunately in some areas Hams remaining are unable to supply the full amount of gear to complete a station. At the November meeting the matter was discussed, and one member present offered a receiver to complete one installation. Another country member has offered items of speech equipment for the same purpose. These offers have given rise to the idea that possibly there are other members, not included in the scheme who may desire to offer certain items of their idle equipment, so that other stations may be completed. If anyone is desirous of doing so would they contact Mr. T. J. Hogan, VK3BX.

At the last meeting a lengthy report was read from PMQ. They request that each division compile a complete list of Hams on service, decorations won, Hams who have paid the Supreme Sacrifice and all relevant details. This is a step towards the post war planning, and also to write the history of the Ham in his service to his country. Everyone is asked to forward to their division or to PMQ any information about himself or about any Ham, member or non-member, he may know of. This will help considerably.

Victorian Members are asked to note that the December meeting will be held on Tuesday 5th December. The January meeting will be on 2nd January also a Tuesday, while the February meeting will be on Tuesday the 6th.

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Neutralisation of AF Regeneration and Hum

Reduction of motor boating and hum of the order of 40db are easily attainable with this method.

In practice the correct value of C2 can most conveniently be found by trial and will usually be from 0.1 to 0.5 mfd.

The formulae mentioned in the previous page is as follows:-

$$\frac{C3}{C2} = \frac{R1}{R2} \left(1 + \frac{R2}{Rp} \right)$$

$$\frac{C1}{C2} = \frac{R3}{R2} \left(1 + \frac{R1}{Rp} \right)$$

Rp equals the plate resistance of the preceding tube.

-----KXIII-----

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THE WIRELESS INSTITUTE OF AUSTRALIA



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Present location of F.H.Q. :— New South Wales

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Vice-President : H. F. PETERSON, VK2HP. Federal Secretary : W. G. RYAN, VK2TI.

Councillors : C. FRYAR, VK2NP ; W. J. McELREA, VK2UV

Official Organ : "AMATEUR RADIO"—Published by the Victorian Division.

VICTORIAN DIVISION

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191 Queen Street.

Visiting Overseas and Interstate Amateurs are welcome at meetings and they are invited to communicate with the Membership Secretaries :

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Telephone : FX3305

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Full Members 10/6 per annum

Service Members 7/6 per annum

The N.S.W. Division meets on the third Thursday of each month at Y.M.C.A. Buildings, Pitt St., Sydney and an invitation is accorded to all Amateurs to attend. Overseas and Interstate Amateurs who are unable to attend are asked to phone the Secretary at FX3305.

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